

**THE VIEJO PERIOD IN WEST-CENTRAL CHIHUAHUA, PART 2:
THE CALDERÓN SITE**

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PREFACE AND ACKNOWLEDGMENTS

This report describes work at a Viejo period site of the southern zone of the Chihuahua culture, by the Proyecto Arqueológico Chihuahua (PAC). Some readers may know the Chihuahua culture by a different name, the Casas Grandes culture. “Southern zone” is project shorthand for the region where we worked, as opposed to the more northerly area where Di Peso and his colleagues worked a half-century ago (and where Michael Whalen and Paul Minnis and others have worked more recently). Now that there has been extensive work in both the northern and southern zones of the culture, we can see both continuity and differences between the two regions.

The Calderón site (Ch-254) was brought to our attention in 1996. At the time and for more than a decade afterwards, the property was owned by Catalino Calderón and his wife, Alicia. They allowed us to work at the site, extended their hospitality, offered helpful advice about fitting into the local community, and at times served as our landlords. Our first thanks must go to them, in recognition of all they did for the project and its members. In 2009 they sold their property to Sr. Luis García Castello, who allowed us to excavate Structure 6 in spite of its being in the path of his new irrigation system. He allowed us to build a dam to protect the excavation and backfilled our work with his tractors.

Permission to work in Chihuahua was granted by the Consejo de Arqueología, Instituto Nacional de Antropología e Historia. INAH Chihuahua facilitated our work at many levels and two of its directors, José Luís Perea and Elsa Rodríguez, extended us many courtesies. Lic. Rodríguez and Lourdes Perez visited the site and talked to local residents with an interest in archaeology (including Pedro Lopez y Lopez, Hector Chavez, and Padre Joscelos). Other residents of Oscar Soto Maynez contributed a great deal to our comfort over the years. We particularly wish to mention Olga Alderete, Pablo Ordoñez, Azuzena Quintana de Varela, José David Carrasco, and the families of Manuel Cisneros and Javier Cisneros.

The site was first visited by Loy Neff in 1996 (University of Calgary), and the first collections were made by A. C. MacWilliams (University of Arizona), Jane H. Kelley (University of Calgary), Anne Marie Duma (Calgary), and John and Rudi Roney (BLM, Albuquerque) in that year. The grid was established and preliminary testing occurred in 1998: the crew included Karin Burd (University of Colorado), Monica Webster and Mitch Hendrickson (University of Calgary), Joe D. Stewart (Lakehead University), Karen R. Adams (a professional botanist from Tucson), and Jane H. Kelley. Four structures were excavated in 1999; the crew included Karin Burd, Monica Webster, Mitch Hendrickson, David Hart (Pennsylvania State University), Rick Garvin (University of British Columbia Okanagan [UBCO]), Julia Mannard (Toronto), Joe D. Stewart, and Jane H. Kelley; Megan Kelley (York University) assisted with the lab work.

In 2005 ground-penetrating radar studies (GPR) and ground truthing was carried out at several sites, including the Calderón site, by J. M. Maillol and Jerimy Cunningham (University of Calgary) and Dominique Cossu (Calgary). They were assisted by Danny Zborover; by Richard Garvin, Darlene Richards, and Joe Desjardin (UBCO). José Ortega Ramirez (INAH) also took

part in the sensing studies; he was assisted by Ulises Nuñez García, a graduate student at the Universidad Nacional Autónoma de México.

During the 2007 field season, the crew mainly divided their time between the Quevedo and Calderón sites, but also conducted survey in the Santa Clara valley. At Calderón, the uppermost floor of Structure 5 was excavated, as was the external hearth area just north of the house. The crew included J. M. Maillol, Dominique Cossu, Danny Zborover, Veronica Pacheco (University of Alberta), Tico Kelley (Austin, Texas), Marco Ortega (El Paso, Texas), Jerimy Cunningham (University of Lethbridge), Metaxia Georgopoulis (University of Calgary), Richard Garvin, and Jane H. Kelley.

In 2008 the excavation of Structure 5 at the Calderón site was completed. The field season also included finer-grained GPR scanning at the same site, GPR work and archaeological reconnaissance in the Santa Clara Valley, and excavation of a partial house at the Quevedo site. The GPR crew members included J. M. Maillol, Dominique Cossu, and Dominic LaCroix. Other field crew members included Danny Zborover, Matthew Wall, Tanya Chiykowski, Jane H. Kelley (all from the University of Calgary), Jerimy Cunningham, Marco Ortega, Natalia Martínez Tagüña (a botanist from the University of Arizona), Laura York (University of New Mexico), and Richard Garvin. Working visitors were Louis Irwin (UTEP), Doug Brethauer (who worked with Kelley in El Salvador in 1979, now from Wisconsin), Anne Brethauer (University of Wisconsin), Alberto Peña (forensic archaeologist with the Policía Estatal de Chihuahua), and Francisco Zuñiga and Rafael Cruz Antillón of INAH Chihuahua.

During the 2010 field season, Danny Zborover initially supervised the excavations at Ch-254; he had other obligations in Oaxaca, however, and on his departure, Tanya Chiykowski became the site supervisor. Crew members included Pauline de Grandpré and Jason Bush of the University of Alberta; Anne Brethauer; Katrina Beck of Simon Fraser University; and Diego Bernabé Barbosa Arredondo, Karla Itzel López Carranco, Christian Edith Medellín Martínez, Sara Gabriela Palomo Govea, Carlos Iván Robles Rodríguez, Citlalli Guadalupe Velázquez Badillo, and Victoria de Lourdes Ventura Donjuan of the Universidad Autónoma de San Luis Potosí. Dan Butler (University of Calgary) collected floor samples and Dan Odell (both of the University of Calgary) conducted further GPR surveys. Douglas Brethauer and Michael Zywna (formerly of the University of Calgary) also worked at the site. Nicolás Caretta (Universidad Autónoma de San Luis Potosí), Rafael Cruz Antillón, Francisco Zuñiga, and Alberto Peña assisted our efforts.

The crews at the Calderón site were quite international: 14 Mexicans, 12 U.S., two French, one Israeli, and one Ecuadorean, in addition to the many Canadians. Of the more than 50 people who worked at the site over various seasons (many for two or more seasons), several followed up with work related to the site or the region. Karin Burd Larkin included materials from Calderón in her dissertation research at the University of Colorado (Burd Larkin 2006). Monica Webster used skeletal materials from the site for her master's thesis at the University of Calgary, describing the use of isotopic analyses to investigate diet (Webster 2001; Webster and Katzenberg 2008). Mitchel Hendrickson wrote a seminal study, later published, of Chihuahua polychromes for his master's thesis at the University of Calgary (Hendrickson 2000, 2003).

Richard Garvin joined Kelley as co-director of the PAC from 2005 forward, replacing Joe D. Stewart. After the later field seasons, other students pursued theses based on the later PAC work.

Tanya Chiykowski wrote her master's thesis for SUNY Binghamton on Viejo period architecture (Chiykowski 2011). Pauline Grandpré Submitted an honors paper to the University of Alberta based on her analysis of a pottery sample from the site (Grandpré 2011). Colleen Haukus (2012) analyzed Calderón site faunal materials at the University of Lethbridge. Darlene Ricketts wrote an M.A. thesis for UBCO University on agricultural practices in the region (Ricketts 2008). Danny Zborover, who participated in all of the project's field seasons between 2000 and 2010, has (like others mentioned here) been a co-author on multiple papers arising from the project (for example, Kelley et al. 2012) and is working on social memory as reflected in the multiple structures recorded as Structure 5.

We offer our apologies to any project participants whom we overlooked, or whose names are misspelled. Those who worked with us, those who gave permission, those who expedited the work, and those on whose goodwill we relied all contributed much to our project, and we acknowledge their assistance with heartfelt gratitude. On a day of remembrance, I remember and thank them all.

Jane Holden Kelley
Calgary, Alberta, Canada
November 11, 2014

Chapter 1

INTRODUCTION

The Proyecto Arqueológico Chihuahua (PAC) was a multi-year effort to document the southern extent of the Chihuahua (Casas Grandes) culture. One of our contributions was to show that the local Chihuahua culture occupation is not confined to the Medio period, but stretches back into the Viejo period just as it does in northwest Chihuahua (see Di Peso 1974; Di Peso et al. 1974). This monograph reports on the investigations at the Calderón site (CH-254), the Viejo period site for which the PAC has the most extensive information (Figure 1). The site is within Colonia Oscar Soto Maynez, 3 km south of the town of that name (formerly Santa Ana de Babicora, the headquarters of the Babicora Baja section of the Hacienda Hearst). This monograph is based on a manuscript (by Kelley) on all of the project's Viejo period studies, which in turn is derived from descriptive reports submitted to the Consejo de Arqueología, Instituto Nacional de Antropología e Historia (INAH). We have adopted a historical approach to data reporting, so the information that follows is largely organized by field season.



Figure 1. Location of CH-254. In the right-hand image, the site area is enlarged.

Source of images: Google Earth.

The site covers 2 ha of an 8 m high terrace on the west bank of a tributary of the río Santa María, the arroyo Teseachic–El Pino (between the confluence of the El Pino and Teseachic and the confluence of the combined arroyos with the río Santa María). The site surface slopes east toward the arroyo that defines the east side of the site; artifacts are exposed in the bank of the arroyo. On the north side of the site, a second arroyo (the “North Arroyo”) is actively cutting headward (to the west). A different active arroyo is south of the site. The site itself is almost entirely within a plowed field that was not irrigated until 2009, so during the late 1990s it was either planted for fodder or not planted at all (in the latter case, because of an extended drought). At times, the property served as a cattle feed lot or horse pasture.

The arroyo that borders the site to the east appears to provide a fairly permanent water source. Spring-fed pools in one bend of the arroyo, just north of the site, contained water throughout the drought of the 1990s. Local residents told us they have never known the pools to dry out.

Before establishment of the local *Colonias* in the 1950s, the site was in a grassland that extended across the broad bottom of the Santa Maria Valley—albeit with riparian corridors. Local residents reported that when this land was part of the Hacienda Santa Ana de Babícora, the basin supported more shrubs, and the then perennial streams contained both fish and local mussels. As Figure 1 indicates, the local landscape is now dominated by farms.

When we first visited the site, in 1996, we were working at CH-218, the first Viejo period site we investigated. The pottery at CH-254 was similar to that being found at CH-218, but with the addition of a polychrome that seemed to be an early version of Babícora Polychrome. In that year the site was recorded and a surface collection made.

Based on our reading of Di Peso (1974; Di Peso et al. 1974), and assuming that the Viejo to Medio sequence in the southern zone mirrored that of northwest Chihuahua, polychrome pottery should have emerged about the same time as above-ground architecture. However, no evidence of surface architecture could be detected at CH-254. The combination of Viejo period pottery types, polychrome pottery, and a lack of surface rooms led us to postulate that the Calderón site fell into a poorly documented transitional period that is critical to understanding subsequent cultural developments (Burd Larkin et al. 2004). The site had been plowed but the surface remains suggested that any intact deposits would provide a variety of materials, including dateable ones.

In 1998, a sketch map of the site was made, along with larger, more systematic collections. In 1999, the entire field season was dedicated to this site; activities included mapping, surveying, surface collecting, and excavation of four structures. We returned to the site in 2005 to conduct a GPR survey and to test some anomalies indicated in the GPR imagery. In 2007, funded by a new SSHRC grant focused on the Viejo period, we used the 2005 GPR information and testing results to select Structure 5 for excavation. Only the upper levels of the structure could be exposed in the time available. In 2008 the excavation of Structure 5 was completed, revealing three underlying structures and a still lower occupation level. A smaller GPR anomaly near Structure 5 was also excavated and proved to be a multi-level external hearth. In 2010, Structure 6 was excavated, again using the results of the 2005 GPR survey but also a finer GPR scan of the Structure 6 area carried out in 2008.

Chapter 2

INITIAL FIELDWORK

The 1996 Work

At the time of our first visits to the site, in 1996, we made surface collections that emphasized textured and decorated pottery, especially polychromes—at the time, no polychrome pottery had been found at Ch-218. The resulting collection of 447 sherds included 259 plain ware, 58 textured, 55 red-on-brown, 29 polychrome, 22 red ware, 12 Pilon Red Rim, 11 “Other,” and one black ware. Also in 1996, a datum was placed immediately south of the north arroyo and points were shot in from that datum to create a preliminary map of the site.

The most common textured category was simple corrugated ($n = 26$), with considerable variation in the width of corrugations and in the amount of smoothing (from none, to almost entirely smoothed). Three additional sherds showed corrugated areas combined with smoothed surfaces to produce a zoned effect. In another sherd, zoned corrugation was combined with scoring or brushing, with a red wash or eroded slip over the texturing. Ten sherds exhibited incisions over the corrugations, and one sherd had finger impressions over the corrugations.

Five sherds with incisions over smoothed surfaces probably would have been called patterned incised sherds had the sherds been larger. Incision over scoring was apparent on one sherd. Five sherds were scored (or brushed and striated). Another sherd had red paint or slip over scoring.

Thirteen of the red-on-brown sherds were designated Mata Red-on-brown on the basis of fine red line designs, but these lacked the hallmark corrugations of the type. The full complement of attributes—fine red lines plus corrugations—was present on only one jar sherd. The other red-on-brown sherds had lines of varying widths.

Only one convincing blackware sherd was tabulated. The 22 red-slipped sherds sometimes had red slip only on the interior, sometimes only on the exterior, sometimes on both surfaces.

A few Babícora Polychrome sherds were collected, but most of the polychromes did not seem to fit within that type. Several notes in the 1996 Ceramic Notebook dealing with this surface collection discuss the unusual polychromes; red and black lines alternated on a brown background, much like Babícora Polychrome, but the designs were “wrong.” The linear and chevron designs echoed some of the Mata Red-on-brown designs, as well as those seen in incised textured wares. We speculated that this was the beginning of the Babícora Polychrome tradition. Later, this became Santa Ana Polychrome (Burd Larkin 2006; Burd Larkin et al. 2004).¹

A few sherds were classed as “Other.” These included five brownware sherds with a whitish or light-colored slip. One of these had fine red lines over the very light surface, and a question was

¹ In 1992, examples of possible Viejo period polychrome, of the same general style, were found at El Zurdo in the Babícora Basin, in Test 14 (Kelley 2009), but the evidence was ambiguous compared to that from the Calderón site.

raised (but not answered) about whether Mata ever had a whitish background (the same question was raised for the whitish sherds at Ch-218). The “Other” sherds also included four black-on-brown and one black-on-red. One sherd was listed as a black-on-white, with the qualification that it was not Mimbres Black-on-white. Instead it might be a variant within the local red-on-brown tradition. Jars seemed to outnumber bowls, unlike the situation at Ch-218.

Although the 1996 surface collection was biased toward textured and painted sherds, it convinced us that CH-254 was a Viejo period site—probably a late Viejo period site transitional to the Medio period—and well worth further investigation.

The 1996 surface collection also yielded a large disk bead (Lot 7021-1; 1.5 cm in diameter, 0.7 cm thick) and a small stone bowl with a hole in the bottom (Lot 7021-4; 4 by 3.9 by 2.3 cm). The bowl was made of vesicular basalt.

The land owner, Sr. Catarino Calderón, gave the PAC two whole axe or maul heads said to have been collected at the site. One (Lot 7021-a) was a large, symmetrical, complete three-quarter-grooved axe head (20.4 by 9.4 by 3.9 cm). The other (Lot 7021-b) was a full-grooved specimen (14.2 by 9.2 by 6.5 cm).

The 1998 Work

In 1998 we made additional surface collections, and conducted auger and other tests in search of buried structures. We also looked for differences in surface artifact distributions as a possible clue to what lay beneath the site surface. The density of surface artifacts varied considerably, but there was no convincing variability in the surface distributions of different pottery categories.

Collections Made at Mapping Points

At each point where the stadia rod was placed during site mapping, sherds within 1 m of the point were collected (Table 1). We reasoned that the resulting sample would help counteract the bias inherent in the 1996 selective grab sample.

If present, other types of artifacts were collected at these points. At Shot 20 (Lot 8008-1) the crew found a ceramic figurine head with a crudely modelled, almost blank face. The back and side of the head has six rows of small indentations suggesting hair (Figure 2). The width of the head is 3.5 cm side-to-side and 2.6 cm front-to-back. The width of the neck is 3 cm side-to-side and 1.6 cm front-to-back. The maximum length of the fragment is 4.3 cm.

A projectile point (Lot 8049-1) was recovered at Shot 49. Made of chert, it had shallow side notches above a broad, fairly straight base (1.2 by 1.2 by 0.25 cm). Other flaked stone artifacts in the shot point collections include an obsidian worked flake (Shot 20, Lot 8008), an obsidian flake (Shot 35, Lot 8009), a rhyolite flake with a worked edge (Shot 21, Lot 8012), and an unworked flake (Shot 36, Lot 8014).

Table 1. Surface Collections Made at Mapping Points.

Lot No.	Shot No.	Undec.	Pilón Red Rim	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Other	Total
8008	20	1					1	1	1	4
8009	35	3		2		1	3			9
8010	23	3				1	2			6
8011	34						1			1
8012	21	2						1	1	4
8013	37	8			1			2		11
8014	36	6			1		1		1	9
8015	38	5				1	2			8
8016	51	2			1					3
8017	28	2				2	3			7
8018	30	3					1	1		5
8019	55	2				1		3		6
8020	56				1		1	4		6
8021	59							3		3
8022	58							2		2
8023	63	1						2		3
8024	1	3	2		2	3	4	4		18
8043	109			1	2	1		2		6
8044	108	2						3		5
8045	106					1	4		1	6
8046	118			1	2	2	2			7
8047	107				2	1	1		1	5
Total		43	2	4	12	14	26	28	5	134
Percent		32.0	1.4	2.9	8.9	10.4	19.4	20.0	3.7	



Figure 2. Ceramic figurine head from the site surface. Left: the back of the head, showing the suggestion of hair. Right: The face.

A complete three-quarter-grooved axe head, with the groove just behind the midpoint of the tool, found at Shot 35 (Lot 8009), measured 16.9 by 7.8 by 5.2 cm. The bit end had sustained some spalling. A midsection of a three-quarter-grooved axe head was recovered at Shot 21 (6.3 by 8.6 by 6.7 cm).

A small stone disk bead at Shot 51 (Lot 8016-1) was biconically drilled and measured 0.70 by 0.75 by 0.35 cm. A second small stone disk bead, found at Shot 120 (Lot 8048-1), measured 0.5 by 0.5 by 0.1 cm.

General Surface Collection

A general (uncontrolled) surface collection (Lot 8000) yielded 87 sherds: 58 plain, 12 red-on-brown, seven textured, six red-on-slate, and four polychrome. The red-on-brown sherds included unambiguous examples of Mata and Anchondo. One of the red-on-brown sherds had a distinctive polka dot design (Figure 3). There were no Pilón Red Rim sherds in this collection, but one corrugated rim sherd had the same kind of red band at its lip. The textured varieties included corrugated, partly corrugated, incised corrugated, “tire track” (created by dragging a fine-toothed object across the clay), and incised. One sherd had an eroded surface. The polychromes included both genuine Babícora and what we later defined as Santa Ana.

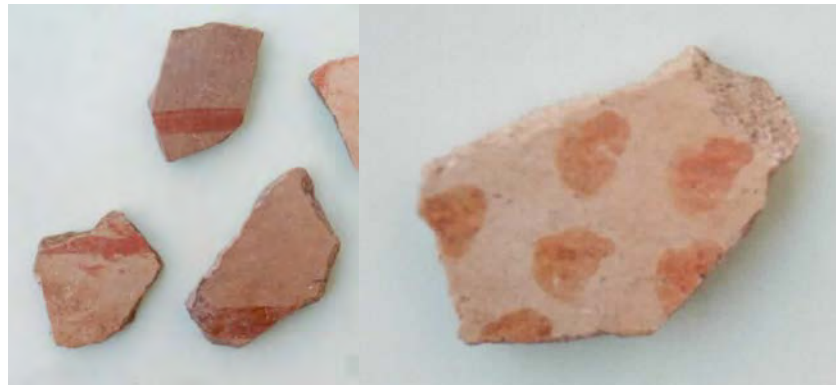


Figure 3. Red-on-brown sherds. Left: the three fully visible red-on brown sherds are most like Anchondo. Right: sherd with a polka-dot design.

A basalt projectile point (No. 8000-1) had irregular side notches and a slightly convex base; it measured 2.2 by 1.1 by x 0.2 cm. A second projectile point (No. 8000-2), of chert, had side notches and a slightly convex base; it measured 2.1 by 1.1 by 0.3 cm. A small disk bead (No. 8000-3) was drilled from one face; it measured 0.4 cm in diameter and was 0.2 cm thick. Other items from the general surface collection included an *Olivella* shell bead (No. 8000-4) and two pieces of malachite (Nos. 8000-5 and 8000-6) (Figure 4).



Figure 4. Non-ceramic items from the 2008 general surface collection. From left to right: projectile point 8000-1; projectile point 8000-2; two pieces of malachite (8000-5 and 8000-6), and an *Olivella* shell bead 8000-3.

Auger Tests

A gas-powered auger with a 15 cm bore was used to test different parts of the site for buried deposits. Three of the four auger holes yielded burned daub fragments, charcoal, and occasional artifacts, convincing us that multiple structures were present (and that we should plan on a major effort at the site in 1999).

The Arroyo Profile

The north face of the north arroyo was cleaned and profiled to discern the level or levels from which cultural materials were eroding and otherwise clarify site stratigraphy. The 1 m wide profile was made at a point where a prehistoric filled pit, some 50 cm deep, was visible in the arroyo wall, marking the apparent north edge of the site. Level 1 (Lot 8001) of the profile was defined as the dark fill of the pit. The pit yielded 42 sherds, mostly from the bottom 8 cm: 29 undecorated, three Pilón Red Rim, six textured, two red-on-brown, one black-on-red, and one with a crackled gray surface. In addition, an animal tooth, small pieces of local mussel shell (probably *Anodonta californiensis*), 14 unworked flakes, two cores, pieces of charcoal, and a few pieces of burned adobe or jacal were scattered through the pit fill.

Level 2 of the profile (Lot 8002) was defined as the arroyo wall below the pit base. No pottery was found in this part of the profile, but a single flake and small bits of shell and charcoal were collected.

Tests 1 and 2

Away from the profile just described, the north arroyo had exposed artifacts and a possible occupation surface—this in the north face of the arroyo. Two contiguous tests were therefore placed immediately north of the north arroyo. Test 1 was a 1 m by 50 cm unit with the long axis oriented north-south, placed so that the southeast corner of the unit was at the arroyo wall. Test 2, of the same horizontal size, was placed directly north of Test 1 in order to expose more of what appeared to be an occupation surface in Test 1, Level 5. Both tests were dug in five levels, to between 28 and 32 cm BS. Level 1 was loose and sandy, and produced only seven sherds,

including the single polychrome sherd from these two units. Level 2 was more compact. Level 3 produced *bajareque* (burned daub from a wattle-and-daub structure), burned adobe, mussel shell fragments, charcoal, and sherds. The heaviest concentration of sherds was in Level 5 of Test 2. On the whole, Test 2—farther back from the arroyo edge—produced more artifacts than Test 1. Table 2 lists the pottery from Tests 1 and 2.

Table 2. Sherds from Tests 1 and 2.

Lot	Level	Undec.	Pilón Red Rim	Red- slipped	Red- on- brown	Text.	Poly- chrome	Other	Total
<i>Test 1</i>									
8003	1	6				1	1		8
8004	2	18		1		4			23
8007	3	22	1		1	5		1	30
8033	4	9				1		1	11
8031	5	6				7		2	15
8032	5	10		1	1	2		1	15
<i>Test 2</i>									
8025	Surf.	1							1
8026	1	7		1				2	10
8050	2	26			1	14		1	42
8051	3	16	2	1		25			44
8066	4	7		1		10		1	19
8068	5	45	1			12		15	73
8071	5	10				5		1	16
Total, both tests		183	4	5	3	86	1	25	307
Percent		59.6	1.3	1.6	0.9	28.0	0.3	8.1	

Many of the undecorated sherds apparently come from the undecorated portions of textured vessels. Sherds that appear to belong to two or perhaps three partly corrugated vessels were found at the base of Level 5 of Test 2, and parts of the same vessels were present in Levels 3 through 5 of both tests. One vessel had a black band over the lip and fine wale corrugations reaching to 14 cm below the neck, with the lower portion of the vessel smoothed. The second vessel had a fairly direct rim with fine-wale corrugations extending 10 cm down the shoulder. Both vessels had sloping shoulders. Other textured sherds include incised corrugated and “tire track.”

Surprisingly few red-on-brown sherds came from these tests, and no polished blacks were tabulated. The only polychrome sherd, from Test 1 Level 1 (Lot 8003), can now be classed as Santa Ana Polychrome.

Some sherds classified as “Other” are from an unusual jar with a dark brown design on a cream-slipped exterior. The design included a broad band with large pendant solids (probably triangles). A sherd from Lot 8031, Test 1, Level 5, is, undoubtedly, part of the same vessel. In 1999, another sherd of this same kind was recovered during surface collection of the same part of the

site (Lot 9060). The “Other” category also includes a large Mimbres Black-on-white bowl sherd (Style 2 or 3; Lot 8066, Test 2, Level 4) (Figure 5), a sherd with a red broad line design on a polished black surface, black-on-red sherd somewhat like Madera Black-on-red, and light-colored, almost white sherds.



Figure 5. Mimbres Black-on-white bowl sherd. From Test 2, Level 4 (Lot 8066).

Of the 13 rims, four (including the Mimbres sherd) were from bowls, eight were from jars, and one could not be assigned to a vessel form.

Flaked stone was uncommon in the two tests, and only unworked flakes were reported. Seventeen of the 27 flakes came from the lowest two levels of Test 1. No ground stone was encountered.

Discussion

Undecorated sherds, mostly brown, represent more than half of the sherd count, while textured sherds account for 28 percent. Black sherds are rare, while red-slipped and red-on-brown sherds are fairly common. In general, Mimbres and the Santa Ana Polychrome were confined to the upper levels of the site. Figures 6–10 illustrate some of the 1998 sherds.

The Tests 1 and 2 pottery appears to be from a fairly late part of the history of the site, with no mixing of deposits. This inference is supported by the presence of Mimbres Black-on-white, the high frequency of textured wares, the low frequency of black wares, and the absence of red-slipped wares. Although the sample is small, it is probably our best excavated sample from the late Viejo period obtained during the 1998 and 1999 fieldwork.



Figure 6. Sherds from the 1998 collections, showing variations in background color and painting. Top: white or gray surfaces with red and polychrome paint, including a red and white on terracotta. Also black on gray on white, red paint over corrugations, red-slipped. Bottom: polychrome sherds, showing similarities in design to red-on-brown and painted and textured sherds.



Figure 7. Seven polychrome sherds collected in 1998. These examples show branching and linear designs like those seen on textured and red-on-brown vessels.



Figure 8. Four sherds in the 1998 collections. Top: red-on-black sherds. Lower left: Ramos-like polished black. Lower right: unidentified red-on-white or red-on-tan.



Figure 9. Textured sherds from the 1998 collections. Top: jar with corrugated shoulder. Lower left: two sherds with whitish paste and scored surfaces. Lower right: rubbed corrugated bowl sherd with red rim.



Figure 10. Sherds from a jar with a corrugated neck and smooth body. Collected in 1998.



Figure 11. Sherds from a second jar with a corrugated neck and smooth body.
Collected in 1998.

Given our preconceptions at the time, based in part on Di Peso's work in northwest Chihuahua, the site's mix of pottery (including polychromes and a probable Madera Black-on-red) suggested that surface architecture should be present. In spite of careful scrutiny, no such architecture was observed. However, the Mimbres Black-on-white sherd and large numbers of textured and red-on-brown sherds showed that the site dates to the Viejo period. In Tests 1 and 2, the amount of burned adobe or *bajareque* suggested that a structure was present nearby. The concentration of pottery in the lower levels of the two tests suggested an occupation surface. The radiocarbon assays obtained following the field season (and provided later in this report) placed the lower levels of Test 2 in the late Viejo period.



Chapter 3

THE 1999 INVESTIGATIONS AT CH-254: SURFACE COLLECTIONS AND EXTRAMURAL TESTS

CH-254 was chosen for intensive excavation in 1999 because the preliminary work in 1996 and 1998 indicated that this was a Viejo period site—probably a late one that was transitional to the Medio period. The absence of surface architecture continued to be a matter of concern, as some Medio period ceramics were present (namely, Babícora Polychrome and one sherd not unlike Madera Black-on-red). However, the recovery of the Mimbres Black-on-white sherd from an excavated context definitely placed some of the site occupation in the Viejo period. An additional consideration in the choice of the site was its central basin location, on a tributary of the Santa María, while most known sites tended to be nearer the basin margins.

In 1999 the first task was to create a site grid. We positioned the north-south and east-west base lines so that they crossed in the center of the slight mound, where cultural deposits seemed the deepest and where we saw greatest number of surface artifacts. Datum points were placed along these base lines at 20 m intervals. A 20 m grid was then extended over the main part of the site and adjacent areas. The center of the grid, defined as N200 E200, served as the main datum. This datum was near the site datum established on the south side of the secondary arroyo in 1998.

Complete surface collections of pottery and worked ground stone were made for selected grid units. A program of shovel testing led to the location of four structures, which were then excavated.

General Surface Collections

As the 1999 crew was becoming acquainted with the site, general (uncontrolled) collections were made from different parts of the site. The sherds from these general collections are summarized in Table 3. The “Other” sherds include a Black-on-red (probably Madera); a bowl rim with a polished steel-gray colored band on the interior of a gray sherd; a faded sherd with a faint design (of large black areas and lines), possibly Babícora Black-on-tan; and, from Lot 9060, a sherd like the unusual painted sherds encountered in Tests 1 and 2 in 1998 (Lots 8031 and 8066). Three of the four polychromes from Lot 9000 were tabulated as Babícora; subsequently, one was assigned to Santa Ana Polychrome, as were four other polychromes from Lot 9060.

Six conjoining sherds were found in profile in the north arroyo (Profile 2, Lot 9060). The jar fragment was corrugated on its upper shoulder. At the widest (smoothed) part of the jar, U-shaped rows of painted dots were found. Red dots painted first, then a black dot was placed almost over each red dot. The reconstructed portion of the vessel was 25 cm tall and 27 cm wide; it seemed to have an unusually high shoulder and to be more globular than many of the jars.

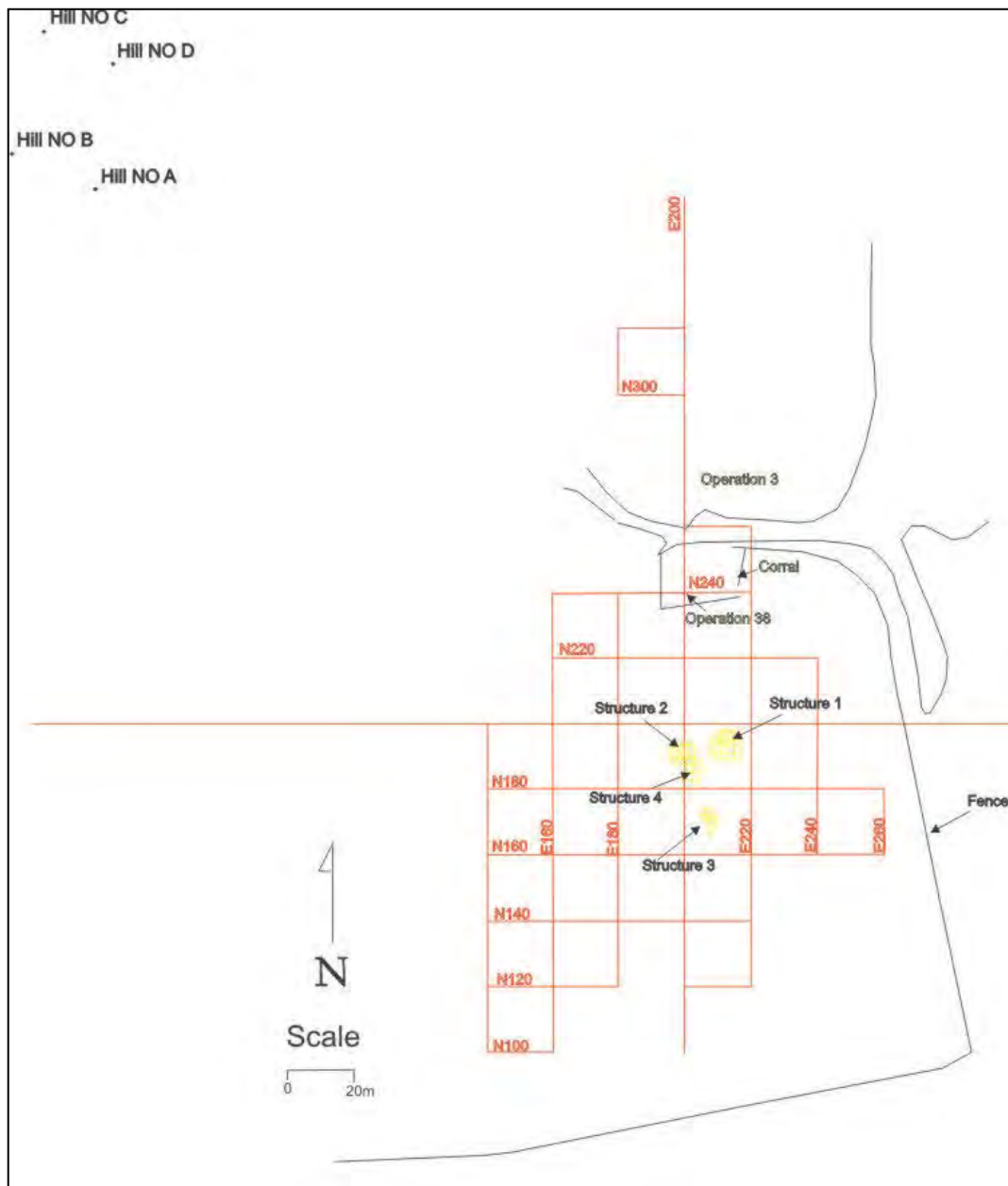


Figure 12. The 1999 site grid. The excavation areas associated with the four excavated structures are shown in yellow. The North Arroyo is shown at N250. “Operation” 3 is Test 3 and “Operation” 38 is Test 38. The map also shows the locations of surface scatters on Hill North (Areas A–D).

Table 3. The 1999 General Surface and Profile 2 Pottery Collection.

Lot No.	Area	Brown	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Other	Total
9000	General	5	2	1	3	13	3	1	28
9000	General			1	2				3
9000	General							1	1
9000	General				1		1		2
9001	N arroyo	4			1	1		1	7
9004	S arroyo	1		1		1			3
9005	E arroyo	2				8			10
9008	W part of site	13			4	7			24
9060	N part of site	3	1	1	2	2	4	1	14
9062	N arroyo*	3				8		1	12
Total		31	3	4	13	40	8	5	104

*Profile 2. All other lots from the site surface.

The textured body sherds included multiple forms of corrugation, including incised corrugated and “tire track” and other varieties of scored. The 11 rims in Lot 9000 included six textured (two with red bands on the lip, one with fingernail impressions, two incised corrugated, and one corrugated), one from a vessel with a red-slipped exterior (with the red slip carried over the lip for 2 cm onto the interior), three undecorated brown, and one brownware rim with the red lip band of Pilón Red Rim. The single jar rim from Lot 9002 was from a corrugated jar. Lot 9062 produced a brownware bowl rim with a darker brown band at the lip. Eight of the rims from Lot 9000 were tabulated as jars, one as a bowl; one was not assigned to a vessel shape. Jars outnumbered bowls 9:2 in these lots.

Few pieces of flaked stone were collected. A rhyolite flake (4.4 by 4.5 by 1.9 cm), with edge “bites” but no definite retouch, came from the small arroyo south of the site (Lot 9004). A cortical rhyolite flake (5.3 by 3 cm) came from the main arroyo east of the site (Lot 9006).

A possible “macaw stone” fragment was found between Structures 1 and 2. This is the only Viejo period “macaw stone” found by the PAC. The central opening is perpendicular to the faces of the stone, which is not as heavy as other “macaw stones” (all presumably from the Medio period) found by the PAC (see Minnis et al. 1993). Of the several such stones, this one is the narrowest and has the most carefully worked exterior surface. The thickness of the stone (perpendicular to the opening) is 8.5 cm. Less than one-fourth of the artifact has survived; the fragment measures 27 cm across and the opening is estimated to have been 14 cm in diameter.

A small hand stone of vesicular basalt (8.35 by 7.1 by 4.7 cm) has a single ground face (Lot 9000). It was found near Structure 4.

A battered three-quarter-grooved axe head (Lot 9000) has a 2.5 cm wide groove just back of the object’s midline. It measures 13.8 by 8.1 by 6.4 cm. It began as a cobble that was minimally altered to by grinding one facet of to achieve the bit edge, and by making the shallow groove.

Two rocks (3.3 and 3.5 cm across) of unusual shape were collected (Lot 9000). Both are small and lumpy and catch the eye.

A small disk bead was collected from the surface at N290–291, E217 from just north of the north arroyo, in the vicinity of Tests 1 and 2.

A 1945 five centavo piece also was collected from the surface (Lot 9000).

Selective Surface Collection of 20 by 20 m Units

After the site grid was established, surface pottery and shaped artifacts other than ground stone were collected within selected grid squares, each covering 20 by 20 m. These units were labeled by the coordinates at the northeast corner of the grid (e.g., the N200 E200 unit encompassed 180 to 200 north and 180 to 200 east). The selected units were ones where we intended to excavate. The surface ground stone was dealt with in a separate effort, focused on units not intended for excavation, and is discussed separately.

Fourteen of the 20 by 20 m units were selected for complete collection of surface sherds. This approach yielded more than 10,000 sherds (Table 4), weighing more than 56 Kg. One of the unit samples (Lot 9016) went missing so is not included in Table 4; it is known to have included a flanged sherd. Units N280 E 220 (Lot 9016; where Test 3 was located) and N240 E200 (Lot 9020) were slated for collection, but the enormous quantity of pottery acquired in the other grid units led to a cancellation of that plan.

As can be seen from Table 5, the heaviest concentration of surface sherds paralleled the main arroyo between the E200 and E220 E grid lines, 60 to 80 m west of that arroyo. Surface indications thinned toward the north arroyo, north of N260 E220 (Lot 9018), but the N320 E200 unit (Lot 9018), some 40–60 m north of the arroyo, produced 180 sherds. The N200 E220 unit (Lot 9009) is where all of Structure 1 and roughly half of Structures 2 and 4 were subsequently excavated. Structure 3 was in the N180 E220 unit (Lot 9014). The largest number of surface sherds came from the southernmost collection unit along the E220 line, but no excavations were carried out in that part of the site.

Because of the large sample size, these collections provide a good look at the upper levels of the site that had been disturbed by plowing. Seven-tenths of these sherds were plain, including brown, tan and black/blackened. Textured wares and a variety of red-on-brown and red-on-tan sherds were routinely present. Ten of the 11 grid units produced small but consistent amounts of Santa Ana Polychrome. The only grid unit that did not produce that polychrome type, N260 E220 (Lot 9018) had a small sample size (n=349). Mimbres Black-on-white sherds were found in two adjacent grid units in the eastern part of the site (N160 E220 and N180 E240) (Figure 13); a reminder that Mimbres sherds were found in the 1998 tests in the northern part of the site

Table 4. Pottery from the 20 by 20 m Surface Collection Units.

Lot No.	Unit	Brown	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Mimbres B/W	Other	Total
9009	N200 E220	798	103	54	89	177	45	3	7	1276
9010	N200 E200	328	107	29	27	77	7		7	582
9011	N160 E220	1227	135	90	122	201	34	1	11	1821
9012	N220 E200	259		30	22	72	9			392
9013	N220 E220	821	104	52	91	156	39		6	1269
9014	N180 E220	455	92	73	60	161	29	1	3	874
9015	N240 E220	771	98	33	94	119	34		1	1150
9017	N180 E240	426	107	55	67	125	23	1	4	808
9018	N260 E220	233	40	22	9	33	4			341
9019	N180 E200	242	44	40	86	119	29		3	563
9021	N220 E180	556	99	37	45	137	12		5	891
9106	N320 E200	137	8	15	5	16				180
Total		6253	937	529	717	1393	265	6	47	10147
Percent		61.6	9.2	5.2	7.1	13.7	2.6	0.1	0.5	

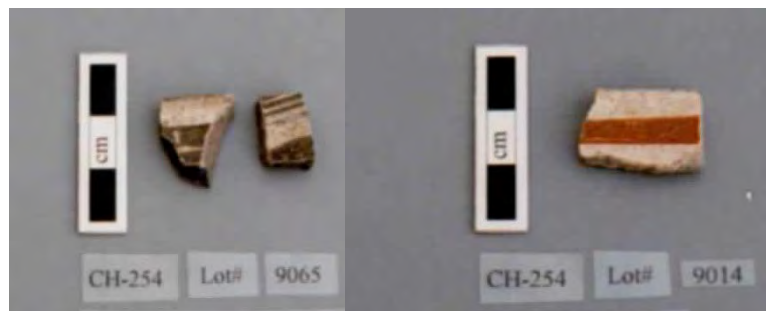


Figure 13. Mimbres sherds from the systematic surface collections. Left: Lot 9065. Right: Lot 9014.

Table 5. Collected Grid Units by Location, with Numbers of Sherds.
(Lot numbers in parentheses. Lot 9106 was outside this part of the site)

Northing	Easting			
	160–180	180–200	200–220	220–240
240–260			341 (9018)	
220–240			1150 (9015)	
200–220	891 (9021)	392 (9012)	1269 (9013)	
180–200		582 (9010)	1276 (9009)	
160–180			874 (9014)	808 (9017)
140–160		563 (9019)	1821 (9011)	

A fragment of an hooded effigy vessel with a coffee bean shaped eye was collected from grid unit N240 E220 (Lot 9015). The fragment had only red paint, but we suspect that it is a later Babicora Polychrome.

One of two brownware sherds from flanged jars came from Lot 9014, the other from Lot 9016. A complete flanged jar simulates a jar neck and shoulder combined with a bowl to create a two-piece container, but was shaped and fired as a single piece (Figure 14). Such jars are an unusual but recurring vessel form in the Chihuahua culture (Kelley 2009:25).

The flaked stone collection from the 20 by 20 m grid units includes only worked items, including tools (Table 6 and Figure 15).



Figure 14. An example of the flanged jar form. Babicora Polychrome; MIAC/Lab # 20560/11. Photo by D. Phillips. Originally illustrated in Kelley (2009, Figure 3.1).

Table 6. Worked Flaked Stone from the 20 by 20 m Surface Collection Units.

Lot	Grid Coordinates	Item	Description
9009	N200 E220	Biface	Olive green obsidian; 3.6 by 1.6 by 0.5 cm
9011	N160 E220	Point fragment	Broken at stem; 2.0 by 1.2 by 0.3 cm
9013	N220 E220	Point	Fine-grained black basalt; Archaic-like; corner notched; 3.3 by 2.8 by 0.55 cm
		Point	Fine-grained black basalt. Shallow side notches, concave base. 1.5 by 1.0 by 0.3 cm.
		Point base	Fine-grained black basalt; crude; asymmetrical concave base that tapers; 1.3 by 0.7 by 0.3 cm
9015	N240 E220	Scraper	Basalt with cortex; 4.7 by 4.3 cm
9019	N180 E240	Point	Fine-grained black basalt; side notched; concave base; 2.3 by 1.1 by 0.3 cm
		Point	Fine-grained black basalt; side notched; base broken; 1.9 by 0.8 by 0.3 cm
9017	N180 E240	Base of point or drill	Fine-grained black basalt; concave base; 2.0 by 1.0 by 0.4 cm
9018	N260 E220	Drill fragment	Very asymmetrical, bifacially worked point of drill; broken base; 1.9 by 0.9 by 0.3 cm
9019	N180 E200	Point fragment	Archaic-like; slightly concave base; one elongated notch; 2.1 by 1.8 by 0.5 cm
9020	N240 E200	Worked flake	Obsidian? Very curved flake with sharp point; 1.0 by 0.7 by 0.3 cm
9021	N220 E180	Point base	White chert; convex base with shallow side notches; 2.0 by 1.1 by 0.5 cm

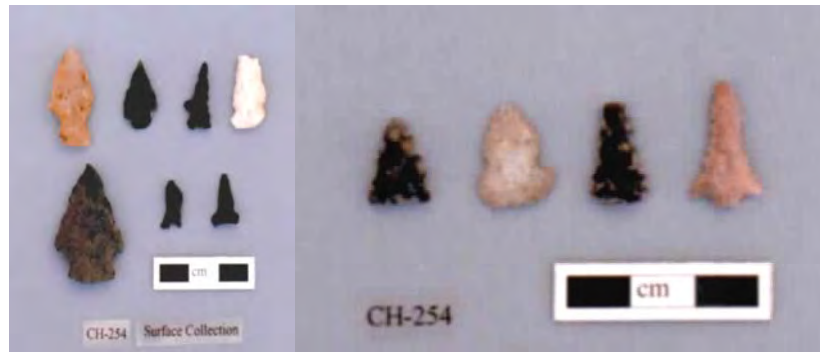


Figure 15. Projectile points from the 20 by 20 m surface collection units.

The selected surface collection units yielded nine disk beads, three *Olivella* shell beads, an incised *Glycymeris* bracelet fragment, a Vermetid tube bead, and a probable stone pendant (Table 7). The last item mentioned is a small chert nodule with a convenient hole toward one (Lot 9010). The chert ranged in color from white through orange to red. It was ovoid from one angle, somewhat boomerang-shaped from another.

Table 7. Ornaments from the 20 by 20 m Surface Collection Units.

Lot	Grid Coordinates	Item	Description
9106	N320 E200	Disk bead	1.7 cm diam., 0.5 cm thick; hole 0.3 cm diam.
9109	N200 E220	Disk bead	1.0 cm diam., 0.4 cm thick; hole 0.2 cm diam.
9010	N200 E200	Stone pendant	2.1 by 0.9 by 0.6 cm
9011	N160 E220	Disk bead	0.5 cm diam., 0.1 cm thick
		<i>Olivella</i> bead	1.8 by 0.7 cm
9012	N220 E200	<i>Olivella</i> bead	1.3 by 0.6 cm
		<i>Olivella</i> bead	1 cm long
		2 disk beads	0.3 cm diam., with 0.1 cm diam. hole; very thin
		Disk bead	1.0–1.1 cm diam., 0.4 cm thick; hole 0.3 cm diam.
9015	N240 E220	<i>Glycymeris</i> bracelet fragment	Incised; 3.5 cm long, 0.5 cm thick
		Disk bead	0.5cm diam., with 0.1 cm hole; very thin
		Disk bead	0.7 cm diam., 0.1 cm thick; hole 0.2 cm diam.
		Disk bead	0.5cm diam., 0.2 cm thick; hole 0.2 cm diam.
9019	N180 E200	1 Vermetid tubular bead	4.6 cm long, 1.5 cm diam.
9060	N200 E240	<i>Olivella</i> bead	1.2 by 0.6 cm
9207	N210 E200	Dish-shaped disk bead	Shell; 0.8 cm diam., 0.2 cm thick; hole 0.2 cm diam.

Three mineral specimens were collected from the grid units. Two were malachite, from N200 E220 (Lot 9009); one measured 1.1 cm across while the other measured 0.8 cm across. An irregular piece of green turquoise was recovered from N220 E200 (Lot 9012). It measured 0.7 cm across.

Recording the Surface Ground Stone

We had been told by INAH's regional office to stop collecting ground stone and so, with three exceptions, the surface ground stone remained in the 20 by 20 m grid unit where it was found. Our usual procedure was to collect all of the surface ground stone within a grid unit at the center of the unit for recording (Figure 16). Almost 700 items were recorded in this fashion.



Figure 16. The ground stone from two surface collection units. Left: from N140 E180, showing multiple mano fragments, two grooved specimens, and two stone bowls (Photo 99-30-13). Right: from N140 E 220, showing a shallow stone bowl, a mano, and two trough metate fragments (Photo 99-30-17).

The decision to record the surface ground stone was not made until after excavation had begun. For the units containing excavations, due to back dirt piles and the actual excavation areas, the tabulations from those units are less complete than they might have been. Also, Because of the stricture against collecting more ground stone, several excavated ground stone artifacts were left in the field. There may be instances of duplicate recording of ground stone, once during the surface tally and again as part of the excavation effort, but the measurements of the pieces precludes extensive duplication.

In all, the surface tally recorded the following items (usually fragments): 314 manos (28 whole), 220 metates, 25 indeterminate fragments (probably from grinding tools), 24 stone bowls, 15 axe/maul heads, 10 polishers, nine balls, The tally also includes two hammerstones, a chopper, and a core. Most were badly damaged by plow action.

The distribution of the surface ground stone provides a crude guide to the intensity of use of different parts of the site. The heaviest concentration of ground stone artifacts was in N200 E240 (where 60 ground stone artifacts were recorded), just east of the excavation units; the grid units south and southwest of the excavation units yielded numbers in the 30s and 40s. The recorded density falls off as one moves away from the central part of the site. The density of surface sherds does not exactly mirror that of the ground stone, so the site formation processes for these two artifact classes must have been different.

The surface ground stone was checked for possible refits, including by comparing pieces of similar raw material (basalt versus rhyolite, for example), grain, and porosity. Remarkably few refits were found within the 20 by 20 m grid units, and no between-unit matches were made. Only in Unit N200/E240 did we find multiple pieces of the same metate (14 metate fragments belonging to four metates).

Most of the manos had a single grinding face and an ovoid cross-section; a few had two grinding faces. Some manos were quite thick and heavy. The manos seem to have been used with a back and forth motion, usually with some rocking to create the convex grinding face. A very few manos had wedge-shaped or “flat” (subrectangular) cross-sections, suggesting that the mano was held at a constant angle relative to the metate.

If, for the most part, we did not overlook matches, almost every piece of the surface ground stone must represent a discrete artifact; most of which still resides in the plow zone.¹ The large number of grinding tools suggests a heavy emphasis on processing plant materials, at least in later times and possibly during the entire occupation.

The tally includes ground stone bowls of the sort found in Viejo and Medio Period assemblages throughout the Casas Grandes area. We have also found such bowls in the Laguna Bustillos area, beyond the boundary of the Chihuahua culture. The count also includes stone axe/maul heads with three-quarter and full grooves, enigmatic stone balls, and polishing stones. It does not include two polishers given to us by local residents.

Some evidence exists for artifact recycling. A mano was re-worked as a three-quarter-grooved axe head. A second mano had a small depression ground into its upper surface.

Igneous materials make up the bulk of the ground stone. Basalts are most common (with great variation in “vesicularity,” from none to Swiss cheese-like). Occasionally, Rhyolite was used for grinding tools. Stone bowls tended to be of softer materials such as tuff and rhyolite, with a tendency toward pumice-like. Polishing stones were often of dense black basalt, less often of rhyolite. Rhyolite, basalt, and chert were used for stone balls.

Shovel Tests

Once the surface collection of sherds was completed, a series of 50 cm diameter shovel tests was placed at 2 m grid intervals over the central part of the site. Additional shovel tests were placed at 20 m intervals over the remainder of the grid, and in the vicinity of Test 3. Not all shovel tests produced cultural remains (Tables 8 and 9). Sherds were most numerous where Structure 1 was later found. Building material such as *bajareque* and adobe were widespread, as was charcoal that could have been associated with structures.

¹Also, most local farmers remove large stones from their fields, so large pieces of metate have a better chance of being removed from a site than other artifacts. At local sites, large pieces of ground stones can be found along fence lines, out of the way of the plows, but no such concentration was seen at this site.

Table 8. Sherds Recovered from the Shovel Tests.

Lot No.	Shovel Test	Grid Coordinates	Level	Undec.	Black	Red-slipped	Red-on brown	Textured	Poly-chrome	Mimbres B/W	Other	Total
9022	1	N220 E220	0-40*	33	5	4	3	6				51
9023	3	N220 E140	0-40*					1				1
9024	2	N220 E180	0-40*	14	6		1	5				26
9025	4	N200 E195	1	36	1	1	3	1	3			45
9026	5	N180 E220	1	38	4		4	5	5			56
9027	6	N140 E180	1	26	5	1	6	11				49
9028	7	N141 E161	1	35	9	1	2	3	2			52
9029	9	N170 E170	1	31	4		2				4	41
9030	10	N120 E180	1	28	2		1	1				32
9031	11	N190 E208	1	23	3	1		4	1			32
9032	12	N198 E210	1	47	14	4	1	14	1		2	83
9033	13	N190 E206	1	50	5			5				60
9034	14	N196 E210	1	42	14		2	5				63
9035	15	N190 E204	1	57	1		1	4	1			64
9036	16	N202 E210	1	118	18	3	8	17	4			168
9037	17	N194 E210	1	77	14	3	13	12	1	1		121
9038	18	N204 E210	1	61	8	6	2	11	1			89
9039	20	N190 E202	1	49		1	2	7				59
9040	21	N192 E210	1	41	8		8	7	1			65
9041	22	N200 E212	1	35	3		2	13	4			57
9042	23	N200 E214	1	21	3	1	2					27
9043	24	N192 E200	1	67	16		3	11				97
9044	25	N160 E168	1	22			3	6	2			33
9045	26	N160 E166	0-55*	14		2		1		1		18
9046	27	N160 E160	0-55*	16			1	3				20
9056	28	N288 E200	0-35*	23		1		1				25
9057	29	N302 E200	0-40*	15			1	3				19
Total				1057	143	29	71	161	23	2	6	1495
Percent				70.7	9.5	1.9	4.7	10.7	1.5	0.0	0.0	

*Depth in cm

Table 9. Other Items Recovered from the Shovel Tests.

Lot No.	Shovel Test	Grid Coordinates	Level	Worked Flaked Stone	Other Flaked Stone	Shell	Disk Bead	Adobe/ Charcoal	Bone	Maize
9022	1	N220 E220	0-40*	1	4				X	
9023	3	N220 E140	0-40*							
9024	2	N220 E180	0-40*							
9025	4	N200 E195	1							
9026	5	N180 E220	1			Local**		X	X	
9027	6	N140 E180	1	1	4					
9028	7	N141 E161	1		1			X		
9029	9	N170 E170	1			4 <i>Olivella</i>	1	X		
9030	10	N120 E180	1							
9031	11	N190 E208	1					X		
9032	12	N198 E210	1	2 points		Local**		X		Cob
9033	13	N190 E206	1					X		
9034	14	N196 E210	1	1				X		Cob
9035	15	N190 E204	1					X		
9036	16	N202 E210	1	Biface				X	X	Cob
9037	17	N194 E210	1					X	X	
9038	18	N204 E210	1			Local**		X		
9039	20	N190 E202	1	Utilized		Local**		X	X	
9040	21	N192 E210	1			Local**		X		
9041	22	N200 E212	1					X		X
9042	23	N200 E214	1					X		X
9043	24	N192 E200	1	Point		<i>Olivella</i>			X	
9044	25	N160 E168	1						X	
9045	26	N160 E166	0-55*							
9046	27	N160 E160	0-55*							
9056	28	N288 E200	0-35*							
9057	29	N302 E200	0-40*							

*Depth in cm. **Freshwater mussel.

One of the projectile points from N198 E2100 (Lot 9032) had a very convex base and long, shallow side notches; the tip was broken (1.7 by 0.9 by 0.3cm). It was minimally shaped, with one surface showing cortex except where retouched along the edges. The other, more fully shaped point from this lot was broken at the stem; it was either side-notched or corner-notched (1.9 by 0.9 by 0.3 cm).

A rather elongated biface, asymmetrical but more or less triangular, was found in Shovel Test 16, N202 E210 (Lot 9036). It was made of fine-grained black basalt, with a convex base. The lower part of one lateral edge had been worked into a concavity (2.8 by 1.2 by 0.5 cm).

From N192 E200 (Lot 9043) came a small triangular point (1.4 by 1.0 by 0.4 cm).

Other Extramural Tests

Test 1999-3

The crew dug Test 3 to look for a structure in the vicinity of Tests 1998-1 and 1998-2, which had been placed to explore deposits exposed by the north arroyo, and was placed 3 m north of Test 1998-2. At the time, the nature of the local trash (based on partly reconstructible ceramic vessels and other artifacts recovered from Tests 1 and 2, the trash appeared to be a primary deposit) and the presence of *bajareque* led us to believe that we were very close to a structure. Test 1999-3 produced a few large sherds that may refit with the vessels recovered in 1998, but by then the 1998 materials in Chihuahua City and we did not have the opportunity to do any refitting. Test 1999-3 also yielded pottery (Table 10), a few pieces of flaked stone, *bajareque*, and chunks of burned adobe no larger than 15 cm across. We reached culturally sterile soil 30 cm below the surface.

Table 10. Pottery from Test 1999-3.

Lot No.	Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Other	Total
9002	Surface	10			3			13
9003	1	22			1	3		26
9007	2	53		2		4	1	60
9058	3	29	7			3		39
Total		114	7	2	4	10	1	138

Based on our observations of the north wall of the north arroyo in 1998 and 1999, and given the outcome of Tests 1998-1, 1998-2 and 1999-3, we now believe that if there was a structure in this area, it most likely was destroyed by the arroyo. The observed deposits and surfaces in this part of the site probably were external work spaces.

Test 1994-4

Located at Shovel Test 4, this was a 2 by 2 m unit at N202 E196. The first level (0–10 cm below surface) produced little of consequence. We subdivided the unit at the beginning of Level 2 and excavated a 1 by 1 m square (N201 E194), Unit 1994-4a. This sub-unit yielded sherds, bone, charcoal, adobe, and flaked stone, but no features. The crew members reached sterile soil 33 cm below the surface. At this point only a few artifacts and charcoal flecks were present, and the unit was abandoned.

The sherds from Unit 1994-4a included 51 undecorated, 38 black, 18 red-on-brown, 15 textured, two red-on-slate, one polychrome, and two “Other.” One bowl rim sherd has a red lip band that extends downward 1 cm on both the interior and the exterior. The incurving rim of a bowl has an incised corrugated design on the exterior and a polished black interior (tabulated as “Other”). The second “Other” sherd had a black band on a gray-brown background. Four of the nine rims came from bowls, three from jars. For two rims, the vessel form could not be determined.

Test 1994-38

Surface collection of the 20 by 20 m grid unit at N240 E210—just south of the north arroyo—yielded 1,151 sherds. In 1999, the northwest corner of that grid unit included a pen for hay storage. The surface indications within the pen were suggestive of a buried occupation zone, perhaps a structure, hence Test 1994-38. This 1 by 1 m unit was placed at N240 E201. The test exposed two parallel lines of compact tan soil surrounded by loose gray gravel. Extensive rodent disturbance was evident. Excavation halted 50 cm below the surface, when culturally sterile soil was found. The excavation produced no structural remains.

The unit produced sherds (Table 11) and flaked stone. One piece of Santa Ana Polychrome was found in Level 1. The red-on-brown sherds from that level included Anchondo Red-on-brown (Lot 9121). The “Other” sherds included an incised rim with a red lip band (Lot 9121) and a polished black body sherd with a gray pencil-width line (Lot 9123). One flake was found in Level 1, 13 flakes and a core were found in Level 2, and five flakes were found in Level 3.

Table 11. Sherds from Test 1999-38.

Lot No.	Level	Undec.	Pilón Red Rim	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Other	Total
9121	1	22		6	1	1	5	1	1	37
9122	2	78		7	10	6	16			117
9123	3	50	1	9	3	4	13		1	81
Total		150	1	22	14	11	34	1	2	235
Percent		63.0	0.4	9.3	5.9	4.6	14.4	0.4	0.8	

Chapter 4

STRUCTURE 1

The southwest pit wall of Structure 1 was encountered in Test Unit 5, quite early in the 1999 field season. Exposing the entire structure took most of the rest of the season, as the structure was quite large (Figure 17 and 18), requiring 29 units varying in size from 1 by 1 m to 2 by 2 m.



Figure 17. Structure 1. Top: looking northeast, prior to excavation of the sub-floor features (Photo 99-23-16). Bottom: looking west at the conclusion of excavations, with the sub-floor features excavated. Most noticeable are the large pits that resulted from salvaging the main posts.

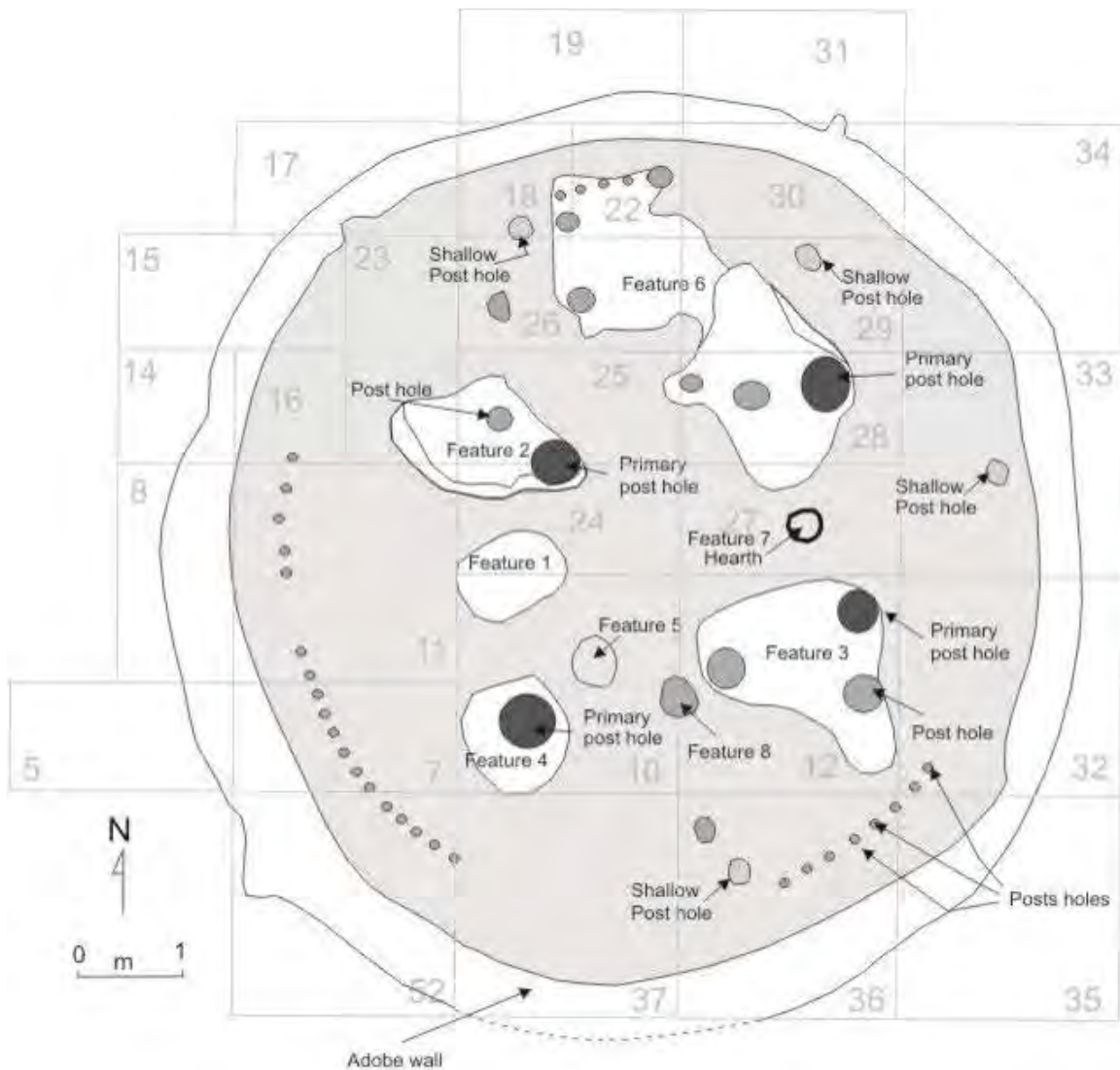


Figure 18. Plan of Structure 1.

The stratigraphy can be summarized across the multiple excavation units. Level 1 was very loose soil from the upper plow zone. Level 2 was the lower part of the plow zone, and was somewhat more consolidated than Level 1. Level 3 may have been partly disturbed by plowing, but was more compact and coherent than Levels 1 and 2. Because the floor of Structure 1 was saucer-shaped, some of the floor edges were slightly higher than central part of the floor and were encountered at the base of Level 3. Level 4 was the fill immediately above the floor. Level 5 was the designation given to sub-floor features, which were individually numbered. The pit house floor was about 70 cm below the surface, with the post holes and pits below that depth.

Given the size of Structure A, in several units we removed the plow zone without screening or collecting. For Level 1, the fill of five units was screened and collected, as was done for eight units of Level 2, 22 of Level 3, 24 units of Level 4 (all inside Structure 1), and nine units of

Levels 5 and 6. Four lots from outside the wall of Structure 1, from Units 33–36, are equivalent to Level 4.

The interior diameter of Structure 1 varied from 7.2 to 7.4 m; the estimated floor area is 43.0 m². The size of this structure relative to Structures 2 and 4 suggests that Structure 1 is a community structure such as Di Peso (1974) reported from the Convento Site. The building was dismantled in an orderly way: it was cleaned out (few artifacts were associated with the lower levels) and the main posts were removed. The village continued to be occupied after Structure 1 was removed from service; the fill that accumulated within the pit (Levels 1–3) included more than 11,000 sherds. We suspected that the structure pertained to the middle period of site occupation.

Architectural Details

Structure 1 was built in a shallow pit. A low adobe wall, varying in thickness from 25 to more than 50 cm, was placed inside the pit wall. The exterior diameter of this adobe wall/pit lining was 8.3 to 8.4 m. We could not tell how high the wall was, or whether it extended above ground level, but we doubt that it was a full height wall because there was little adobe in the structure fill. Based on the presence of both adobe and *bajareque* in the structure fill, the upper wall of the structure may have been wattle and daub. Two floors were detected.

The roof was primarily supported by four posts that were removed at the end of the structure's use. Their removal left large holes that were never repaired or plastered over (Features 2, 3, 4 and 6), and which made it difficult to estimate the sizes of the posts. The four pits extended 50 to 55 cm below the floor, suggesting that the posts were substantial. At three of the four primary posts, additional holes in the bottom of the disturbed sections are interpreted as smaller, secondary posts. In the disturbed area around the northeast post, in Unit 28, a smaller post hole extended to 26 cm below the floor. Other pits, such as Features 5 and 8, could have held additional secondary posts or (since all of the pits were thoroughly cleaned out) they could have had different functions. At least four additional supports were placed near the periphery of the building, 25 to 50 cm from the walls. These "holes" were shallow indentations in the floor (only 3–5 cm deep) and only 20 cm or so in diameter, and are likely to have been added later. The regular spacing of the three secondary post holes in the northeast quadrant of the structure suggests a pattern of eight evenly placed secondary supports around the edge of the room (with some subsequently removed and covered by the upper floor).

The subfloor post holes, pits, and disturbed areas (particularly Feature 3, associated with the southeast primary post), contained numerous fragments of unworked mussel shell as well as fire-cracked rock, charcoal, adobe, *bajareque*, and the occasional artifact and macrobotanical remains.

Lines of small, tertiary post holes were found in the lower floor, near the room's periphery. These post holes were 3 to 7 cm deep and about 5 cm in diameter. The ones in the southeast and southwest parts of the room were thought to be part of a formerly continuous line of posts. Beyond that, it was not clear whether the posts were continuous around the periphery of the room, or occurred in discrete groups. The holes had been covered by floor plaster, making it

clear that they were removed prior to the laying of the upper floor. We favored the idea that they represented an internal screen or screens.

The floor was slightly concave, with the center some 15 cm below the edge. In the central part of the structure, floor preparation involved placing 10 to 20 cm of fine grey ashy material over the pit bottom. The first floor was then added; it consisted of 1 cm or more of clay plaster that covered the entire interior and was continuous with the lower wall/pit lining. The second floor, mostly also about 1 cm thick (thicker patches were noted), was laid over much of the interior but did not form a continuous surface with the lower wall/pit lining. This second floor was markedly thicker around the hearth than elsewhere.

Floor features included several cleaned-out pits (Features 1, 5, and 8).

Feature 1 was a flat-bottomed oval pit measuring 85 cm east-west by 55 cm north-south and extending 35 cm deep below the floor. No artifacts were recovered from the fill. When the floor plaster that had sealed the pit had broken away, this damage was not repaired.

Feature 5 is a circular pit, 45 cm in diameter and 50 cm deep; as was noted above, it could have supported a secondary post. Broken floor plaster extended some 3 to 6 cm over the rim of this pit.

Feature 7 was a shallow, basin-shaped hearth placed midway between the two primary posts in the east half of the room. The hearth, which measured 25 cm in diameter, was contemporary with both floors. The floor and subfloor surrounding and under the hearth itself was burned bright orange to a depth of several centimeters.

Pottery

Here we tabulate sherd information by the levels defined earlier (Tables 12 and 13). While the upper levels were only sampled, the sample is certainly large enough: more than 13,000 sherds, with a combined weight of more than 80 kilos. Most of the sherds were found in the upper levels; fewer than one-fifth came from Level 4 and the subfloor units. The vertical distribution of the sherds supports the view that the structure went through an orderly abandonment, after which it served as an area for trash disposal.

The frequencies of undecorated sherds rise from the lowest levels to Level 1, black wares are much more frequent at the lowest levels, textured wares appear to be slightly less common in the upper levels, and Mimbres pottery is confined to the upper two levels. Sherd size decreases substantially toward the upper levels, supporting the notion that the upper two levels were badly disturbed by plowing.

Table 12. Sherd Counts for Structure 1, by Level.

Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Mimbres B/W	Other	Total	Weight (grams)	Rims
1	1189	85	90	130	179	7	2	9	1691	4338.5	55
2	1869	283	201	178	350	38	1	21	2941	13868	129
3	4152	799	240	347	1004	29	1	48	6620	44722	352
4	758	308	73	87	194	1		15	1436	10398	76
Subfloor	329	137	18	59	78	2		8	631	5621.5	37
Trench	115	13	4	18	27	3		1	181	1338	6
Total	8412	1625	626	819	1832	80	4	102	13500	80286	655

Table 13. Sherd Percentages for Structure 1, by Level.

Level	No. of Sherds	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Mimbres B/W	Other	Average weight/sherd (rams)
1	1691	70.27	5.02	5.31	7.74	10.57	0.41	0.11	0.53	2.62
2	2941	63.54	9.22	6.83	8.24	11.9	1.29	0	0.70	4.71
3	6620	63.60	12.15	3.63	5.21	15.19	0.43	0	7.27	6.75
4	1436	52.78	21.48	5.08	6.05	13.51	0	0	1.04	7.24
Subfloor	631	52.13	21.71	2.85	9.35	12.61	0.30	0	1.26	8.90

If we are correct in thinking that Structure 1 was built in the middle part of the site occupation, and also correct in assuming that the Santa Ana Polychrome was adopted late in the history of the site, it is disconcerting to find two polychrome sherds in Level 4 and three in sub-floor contexts. In re-examining the field lab records for these sherds, we found that the two polychrome sherds from Level 5 in Feature 2 were drawn, and based on the drawings the sherds are not Santa Ana Polychrome. Rather, they have very large red areas, probably triangles, with some vague black lines outside those areas. The third polychrome sherd in that lot was not drawn. For the two polychrome sherds noted for Level 4, one was drawn and is definitely Santa Ana Polychrome. In other words, at least one Santa Ana Polychrome sherd was found in the fill level most closely associated with the structure's occupation. Level 3 yielded 21 polychrome sherds, but this is to be expected for the upper levels of the site.

The sherds generally came from jars and bowls. Incurved (tecomate) rims and everted (plate) rims were present. A small ceramic ladle had a crudely modeled bowl and handle. The outside of the bowl measured 3.3 by 3.0 cm. The handle was 2.3 cm long and 1 cm in diameter at the bowl, tapering to the end.

Other Artifacts

A projectile point was found Unit 11, Level 2 (Lot 9081). Made of fine-grained black basalt, this slender, side-notched specimen has a straight base (2.3 by 1.0 by 0.3 cm).

The object shown in Figure 19 came from Test 11, Level 3 (Lot 9091). Made of vesicular basalt, it is indented at one end and has a shallow circular depression in one face (length: 19.0 by 8.5 by 3.7 cm).

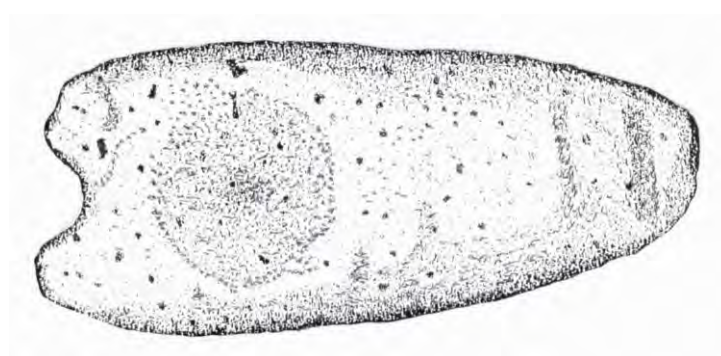


Figure 19. Shaped piece of basalt from Structure 1.

A ground stone bowl was found in Unit 26, Level 3, 10 cm above the floor of Structure 1 (Lot 9180). The bowl is more or less round (18 cm diam., 8 cm thick). The depression is 3 cm deep at the bowl's center; the thickness of the bowl rim varies from less than 1 cm to 1.5 cm.

No metate fragments were found at Structure 1. A mano end fragment was found in Unit 37c, Level 3 (Lot 9211c). The surviving portion measures 10.5 by 8.5 by 6.6 cm; the complete

specimen would have been large and heavy, of the two-hand kind. The grinding face is convex in both dimensions, and is ground almost to the end.

Two fragments of full-grooved axe heads were found, one in Unit 37a, Level 3 (Lot 9211a) and the other in Unit 37b, Level 3 (Lot 9211b).

A stone ball was recovered from Unit 32, Level 3 (Lot 9132). The ball was pecked to shape.

A disk bead of was found in Unit 22, Level 4 (Lot 9221), from a disturbed floor area. The bead measures 1.7–1.8 cm across and 0.4 cm thick; the hole measures 0.4 cm in diameter.

A turquoise pendant fragment, broken at the suspension hole, was found in Unit 23, Level 3 (Lot 9185). It measures 1.5 by 1.1 by 0.5 cm. The front of the pendant was carefully polished; the flat reverse side shows less polishing and more matrix. The pendant may have broken in manufacture, as the area of the broken hole is quite thin.

A carved rock pendant came from Units 22/26, Level 5 (Lot 9303c) (Figure 20). The pendant was found 25 cm below floor level, in a disturbed area. Suspension was by a “neck” rather than by a hole. The pendant measures 2.2 by 1.4 by 0.9 cm.



Figure 20. Two ornaments from Structure 1. Left: Small carved rock pendant. Right: *Glycymeris* shell fragment with drilled hole and a second hole at the upper break.

Four pieces of shell were found. One *Olivella* bead came from Unit 29, Level 3 (Lot 9195) and measured 1.2 by 0.6 cm. A second *Olivella* bead came from Units 22/26, Level 5 (Lot 9303b) and was 1.2 cm long. A *Glycymeris* bracelet fragment with a drilled hole came from Unit 25, Level 4 (Lot 9224). It measures 4.0 by 0.6 by 0.2 cm. A second, partial hole is present at the upper end as shown in Figure 20. Adding a hole allowed use of the fragment as a pendant, but perhaps it took two tries to get a functioning hole. A Vermetid bead was found in Units 22/26, Level 5. It was 2.0 cm long and 0.9 cm in diameter.

A small piece of yellow ocher was found in Unit 2, Level 4 (Lot 9213).

It is not clear that any of these ornaments were actually associated with the use of Structure 1. The Level 4 and 5 ornaments would seem to be the most likely candidates. The larger items

(such as the mano end, the two axe head fragments, and the stone ball) all came from Level 3 and relate to trash dumping rather than to use of the structure.

Discussion

Structure 1 was something of a mystery to us in 1999. This was the first structure excavated at the site with an adobe wall base placed within a pit. Structures 2, 3, and 4, also excavated in 1999, lacked this construction detail. However, Structure 1 at the nearby Quevedo site (Ch-218) also had an adobe wall base placed in a pit—something equally unexpected at that site, given our preconceptions of pit houses. We debated endlessly about whether the walls could have been full height, and if not, what was the superstructure made of? Was there enough adobe in the structure fill to allow us to assume that the walls had been appreciably higher? Was the amount of *barbeque* in the fill sufficient to account for a wattle and daub superstructure on an adobe wall base? It was only with the GPR surveys of 2005 and later years that we came to appreciate that the architecture seen in Structure 1 was quite common on the site, and had been employed over much of the site's occupation (as well as at all sites for which we have GPR imagery).

Because Structure 1 was larger than the other three structures excavated at the site in 1999, we wondered whether Structure 1 was a community structure such as Di Peso (1974; Di Peso et al. 1974) found at the Convento site and one of the Los Reyes sites. One of Di Peso's criteria in distinguishing "community houses" from other houses at his sites was the greater size of the former. Structure 6, excavated in 2010, proved to be almost as large as Structure 1, leading Chiytowski (2011) to question Structure 1's status as a community or specialized structure. However, Kelley feels that the additional features of Structure (such as the row of small posts that could have been part of a screen or bench near the periphery of the room, and the symmetrical subfloor pit that had been opened and its contents removed, presumably when the structure was abandoned) are further indications of a special use for this structure. To date, neither of these features has been found in other southern Viejo period houses. Whatever its role in the community, Structure 1 underwent at least one major renovation, and was an obvious feature of the village for an extended period.

We persist in thinking that Structure 1 is not part of the earliest or latest occupation at the site. If we are correct in thinking that this is a special-use structure, following its abandonment and systematic dismantling (and given the fill that accumulated in the abandoned structure), the settlement may have lacked a community structure. This is by no means certain, however. The succeeding community structure may have lacked the solid adobe wall base that would ensure its appearance on GPR images, or it may have built outside the GPR survey area.

Structure 1 may be the only Viejo period structure investigated by PAC that was systematically dismantled. Since the structure didn't burn, we wonder what led to its abandonment while the community continued to be occupied. Other possible candidates for systematic dismantling are Structure 2, which had a "sealed" hearth, and Structure 6, where the main roof support posts may have been removed at the end of the structure's use life. It is therefore interesting that Structure 6 is the other especially large structure found on the site.

Chapter 5

STRUCTURE 2

Figure 21 shows Structure 2 after excavation. The decision to excavate at this location was based on the abundance of artifacts and the presence of large amounts of adobe and a possible floor (the last was found during Shovel Test 24). The stratigraphy of the fill above the structure was fairly consistent. Level 1 was defined as the surface and loose upper plow zone. Level 2 was the more compact lower plow zone. Level 3 was roughly at the level of Structure 4 (immediately south of, and overlapping, Structure 2) and perhaps derived from an outdoor work area associated with Structure 4. Level 3 consisted of compact soil, with a discontinuous occupation surface detected in two units. The level was immediately above the roof and wall fall that covered the floor of Structure 2; a great deal of rodent disturbance was present over the southern third of the structure. Level 4 consisted of construction debris from Structure 2, mixed with sandy loose soil. Few artifacts were found in this level, but it contained burned vegetal material. Level 4 was halted some 5 to 10 cm above the floor of Structure 2. Level 5 was the fill directly above the floor of Structure 2, along with any objects resting directly on the floor. Level 6 was reserved for the sub-floor features and tests, and Level 7 was assigned to a section of the north adobe wall base that was removed.



Figure 21. Structure 2 after excavation. View to the NE. Part of Structure 4 can be seen at the lower right. Unit 64, the trench linking the Structure 1 and 2 excavations, is at the upper right. Photo 99-24-24.

We suspect that the house was deliberately abandoned and burned, possibly following placement of the burial found in the southwest quadrant of the house. An orderly closing of the house is suggested by the scanty nature of the floor assemblage and, more clearly, by the sealing of the hearth prior to the burning of the house. After the house burned, the depression filled with construction debris.

The features associated with Structure 2 will be described first, followed by a description of features in the fill overlying the floor.

Architectural Details

Structure 2 was a rounded house. At least on its north side, the house was placed in a shallow pit against which an adobe wall base was built (Figure 22). The structure measured about 7 by 6.5 m and had a floor area of about 31.2 m².

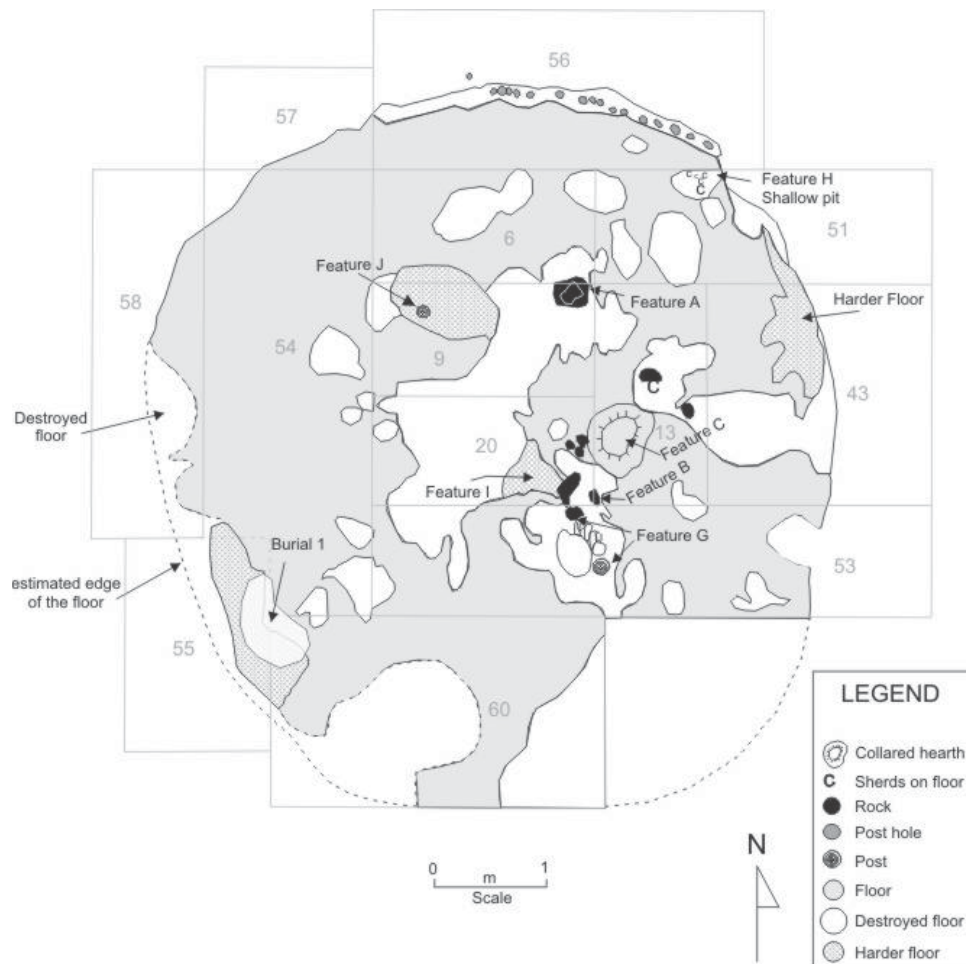


Figure 22. Plan of Structure 2. Feature A was a rock associated with an upper exterior surface. The rock was pedestaled to indicate the level of that upper surface.

The excavators guessed that Structure 2 had a roof support system involving four posts in a square pattern, with the northeast and southwest posts located in disturbed sections of the floor. Based on a restudy of the photographs and field notes, and on the two-post roof support systems found during the excavation of Structure 5, we now believe that the Structure 2 roof was supported by two interior posts. The NNW–SSE orientation of the posts approximates that of the two-post system of Structures 5A and 5B.

The wall base was best preserved at the north end of the house (Figure 23). This portion of the wall base extended about 3 m and was about 15 cm wide and 16 to 20 cm tall. The post holes in the wall base were 9 to 12 cm apart, 4 to 6 cm in diameter, and 2.5 to 3.5 cm deep.



Figure 23. Three views of the adobe wall base. Top: note the post holes for slender poles. Photo 99-22-0. Middle: note the continuation of the floor plaster onto the wall base, and the thickness of the adobe footing. Photo 99-22-2. Bottom: a side view, showing the depth of the pit against which the adobe footing was placed.

Two pole ends were found embedded in the wall base. Those pole ends, along with a section of wall base, were removed for future study. Karen Adams subsequently identified the two pole ends as Douglas fir—a wood that must have come from the mountains to the west.

Although some charred poles were recovered in the northern part of the structure, next to the north wall (Figure 24), it is not clear which part of the superstructure these represented. Chunks of daub with small branch impressions were found throughout Level 4.



Figure 24. Charred beams or supports found near the north wall of Structure 2. Unit 56, Level 5. Photo 99-24-3.

Based on a mixture of grass and clay, which in this case had burned, the walls and roof may have been covered by bundles of grass plastered with daub. The peripheral poles at the north wall must have extended upward and inward, and presumably rested on a beam set on the two main posts. Di Peso et al. (1974 4:159) described a similar technique for structures at the Convento site, showing one structure with a pointed or tepee-like superstructure. The peripheral poles may instead have been bent, resulting in a more dome-like superstructure.

The floor was partly burned and otherwise damaged (by rodent activity, by the intrusion of Burial 1, and possibly when the structure was leveled), and could not be traced in all directions. Where preserved, the floor plaster was dark red to black clay. In most of the structure one layer of floor plaster was present; it was 3 cm thick in the center and thinned toward the structure's edges. However, up to three levels of floor plaster were present around the hearth. The floor plaster continued over the collar of the hearth and into the fire pit; it curved up onto the wall footing at the north end of the structure (Figure 23), but seemed to curve up directly onto the shallow pit wall on the structure's east side (Figure 25). A much harder plaster was encountered in two parts of the floor periphery, and a caliche section in the center of the floor (Feature I) was probably a floor patch.



Figure 25. Structure 2, showing the east edge of the floor. Here the upturned plaster floor appears to have rested directly against the shallow pit wall. The plaster shown in the left side of photograph, at the edge of the floor, had impressions possibly from the palm or hand of the plasterer. View to the west. Unit 43, Level 5; Photo 99-2-15.

The following features were part of, or otherwise associated with, Structure 2.

Feature C, in Test 13, was a plaster-lined, basin-shaped hearth measuring 25 cm in diameter, with a 5 cm wide adobe collar (Figure 26). The collar rose 5 cm above the adjacent floor, while the fire pit dipped 10 cm below that surface. The hearth appeared to have been sealed with adobe or plaster and a rock. The hearth fill was ashy and full of charcoal. A large mano and an oblong stone bowl (Figure 31, below) rested on the floor just north of the hearth. Just northwest of the hearth, in Tests 13 and 20, was a concentration of burned reeds; the pattern suggested a mat sitting directly on the floor. To the west of the hearth, next to the burned reed “mat,” sat Feature B—a possible pot rest consisting of three small stones forming a triangle on the structure floor (Figure 26). Feature B was next to the northernmost post hole of Feature G.

Feature H directly abutted the wall-base segment found in Test 56. Feature H was 40 cm in diameter, extended 15 cm below the floor, and contained five large fragments of a bowl (Lot 9328) (Figure 27). The bowl was recorded in the lab as a plainware vessel with traces of red slip or paint on the exterior; the field photograph appears to show dark red or black lines on the bowl interior.

Feature I consisted of a packed layer of caliche on the same level as the floor and may represent a floor patch; the original floor was missing in this portion of the structure. There were no cultural deposits below the caliche layer.



Figure 26. Structure 2, Feature C (collared hearth). *Top:* showing the hearth sealed with an adobe-like mixture. *Bottom:* after excavation. A mano and an oblong stone bowl rested on the floor to the left (north) of the hearth. The three stones below (west of) the hearth may have been a pot rest.



Figure 27. Bowl fragments found in the fill of Structure 2, Feature H. Photo 99-22-4.

Feature G, in the southeast quadrant of Structure 2, was first thought to be an area where the floor was missing. A burned post and a cluster beads were found roughly at floor level (Figure 28). The beads included 39 fairly complete *Olivella* shells, 14 fragmentary ones, and a disk bead (1.0 by 0.9 by 0.4 cm) with a biconical hole (0.2 cm diameter). The beads, the soft fill, and an infant or juvenile human metatarsal led us to suspect that an infant burial was present. However, additional excavation of Feature G yielded no more human remains. We concluded, tentatively, that the feature did not include a burial—but given the amount of disturbance by rodents, we could not rule out the possibility.

As excavation progressed, Feature G developed into a plastered pit, the post that had been observed at floor level, and several holes (presumably for additional posts) along the east and northeast sides of the pit (Figure 29). The plastered pit, ovoid in plan, measured 65 cm north-south by 45 cm east-west. The pit was up to 15 cm deep and contained no artifacts below those mentioned as being found more or less at floor level.

The burned post observed at floor level was one of two main support posts for the structure (the other being Feature J in the northwest quadrant of the house. Thus, the roof line was oriented northwest-southeast). The burned post had bits of bark still attached, allowing a precise estimate of its original diameter—17 cm. The surviving portion of the post extended only 13 cm below floor level but the post hole itself was 65 cm deep; there was no footing stone at the bottom. In Figure 29, the hole for the main support post is the largest and northernmost of the holes along the east side of the plastered pit. Given the shape of the next hole to the south, it may have supported two auxiliary posts. Thus, the main post may have been reinforced by two or three auxiliary posts. The holes for these auxiliary posts were 40 to 45 cm deep.



Figure 28. Structure 2, Feature G, Structure 2, after initial exposure. The charred post is near the center of the photo, between the signboard and the direction stick. The small cluster of ornaments is to the left of the direction stick. Photo 99-22-9.



Figure 29. Structure 2, Feature G, following excavation. North is to the top of the photograph. The contiguous holes to the right of the plastered pit supported a main roof support post (the northernmost hole) and two or three auxiliary posts. At the top (north end) of the photo, a smaller post hole is visible. To the northwest of that hole, outside the photo, was an additional post hole. The last post hole included in the feature was southeast of the contiguous holes, also outside the photo. Photo 99-22-12.

Feature G included three other holes, two northwest of the contiguous holes and one southeast of them. All three additional holes were smaller and shallower than the ones already discussed. The two north of the plaster pit (and northwest of the contiguous holes) were both 23 cm deep and 15 to 17 cm in diameter. The hole nearest the plastered pit retained a bit of burned post; a burned pole (22 cm long, 15 cm diameter) found next to this hole, at floor level, might have been supported by the hole. The hole southeast of the contiguous holes was 10 cm deep and 12 cm in diameter. Even though one of the holes apparently supported a post, the function of the three additional (non-contiguous) holes remains unclear. Perhaps all of the holes supported the roof; perhaps not. Taken as a whole, Feature G was part of the roof support system for the structure, but other things seem to have been going on as well.

Feature J, the northwest hole for a primary post (in Unit 54), contained no post remnant. The post hole measured 50 cm in diameter and was 36 cm deep; a footing stone, 15 in diameter, was found at the bottom. The hole dimensions suggest a somewhat larger if more shallowly placed post than was seated in Feature G. Chunks of daub were found in the post hole fill.

Burial 1 (in Units 54 and 55) appeared to have been placed after the structure was abandoned; the burial pit cut through the floor and although the top of the grave was not precisely defined, the pit began in fill above the floor. Burying in abandoned structures or between structures appeared to be the norm at this site: Burial 3 was intrusive in Structure 3, and the third of the excavated burials was outside a structure.

Features in the Upper Levels

The following features were located in the fill above the floor of Structure 2, so represent activities that postdated the use of the structure. These activities most likely were part of an outdoor activity area associated with Structure 4.

Feature A was a large rock that was pedestaled by the crew. The rock is shown on the plan of Structure 2 (Figure 22).

Feature K (Test 20, Levels 3 and level 4) consisted of a metate fragment surrounded by smaller stones (Figure 30). The upright stones were first visible at 39 cm BD, while the top of the metate was at 52 cm BD. The upright stones rested in loose soil. There did not appear to be any burning on or around this feature, the base of which was 18 cm above the floor of Structure 2.

Like Feature K, Feature F was a large rock surrounded by smaller stones (in this case, fire-cracked rock and cobbles) (Figure 30). The rectangular central rock in Feature F measured 22 by 20 cm; it was flatter than the one in Feature A. The entire feature measured 38 by 35 cm. Unlike Feature K, this feature showed evidence of burning and charcoal-rich soil covered the feature.



Figure 30. Structure 2 excavations, Features K and F. Left: Feature K, looking south. Test 20, Level 3. Photo 99-20-3. Right: Feature F, looking west. Unit 60, Level 4. Photo 99-24-9.

In addition to the formal features, the fill above Structure 2 yielded several sherd clusters. Two partly reconstructible vessels were found in the fill above the roof and wall fall level (Levels 2 and 3) of Unit 6. Fourteen sherds of a Santa Ana Polychrome vessel were found in Level 2 (Lot 9052) and 22 sherds in Level 3 (Lot 9063). The same two levels of Unit 6 also produced 26 sherds of a “grayed” plain brown vessel from Level 2 (Lot 9052) and 53 sherds of the same vessel from Level 3 (Lot 9063).

Level 2 of Unit 9 (Lot 9087) yielded several sherds from a sloping shoulder of an undecorated olla, as well as a lower portion of an olla that might have been the same vessel.

In Unit 20, two partial vessels were found at a depth of 18 to 22 cm BD. One of these consisted of 10 sherds of the lower part of a Santa Ana Polychrome olla. The other was part of a corrugated olla.

Pottery

Tables 14 and 15 summarize the pottery from the Structure 2 excavations. As was the case for Structure 1, the average weight per sherd is nicely graduated from top to bottom, with the few subfloor pieces appreciably larger than average. Almost half of the sherds came from Level 3; less than one-tenth came from Levels 5 and 6, the only levels with materials possibly related to occupation of the structure.

Table 14. Sherd Counts for Structure 2, by Level.

Level	Undec.	Black	Red-slipped	Red-on brown	Text.	Poly-chrome	Other	Total	Weight (grams)	Average Weight* (grams)
1	671	65	22	68	118	8	3	955	2896	3.03
2	1269	140	61	59	200	24	12	1791	8604	4.87
3	2709	679	136	196	465	42	65	4292	25055	5.83
4	740	278	73	80	117		23	1311	7832	5.97
5	367	117	48	23	39		11	605	3971	6.56
6	68	1		2	7			78	1159	14.85
Totals	5824	1280	340	428	946	74	114	9032	49516	

*Per sherd

Table 15. Sherd Percentages for Structure 2, by Level.

Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Other
1	70.3	6.8	2.3	7.1	12.4	0.9	0.3
2	70.8	7.8	3.4	3.3	11.2	1.3	0.7
3	63.1	15.8	3.2	4.6	10.8	1.2	1.5
4	56.4	21.2	5.6	6.1	8.9		1.8
5	60.7	19.3	7.9	3.8	6.4		1.8
6	87.2	1.3		2.6	9.0		
Combined	60.1	14.2	3.8	4.7	10.5	0.8	1.3

The undecorated sherds do not show the same progression. In terms of percentages, they are most common in Level 6 (which was the smallest sample) and least common in Level 4. If one looks at departures from the Structure 2 average for undecorated sherds, only Level 4 is below that average. The percentages of black sherds increase below the plow zone but are relatively rare in Level 6. Red-slipped sherds are also common, relatively speaking, in the lower levels but absent in Level 6. Red-on-brown sherds do not show an even progression but tend to be more common in the upper levels. (The combination of red-on-brown painting with texturing or black or red slips falls in the “Other” category, so red-on-brown sherds are slightly more common than Tables 14 and 15 indicate). The polychromes can be assigned to Santa Ana Polychrome rather than Babícora Polychrome, and are totally absent from the lower levels. Texturing increases in the upper levels. As in the case of other categories, sherds with multiple decorative media (as, for example, Mata Red-on-brown textured) were placed in the “Other” category—a procedure that does not alter the frequencies to a significant degree. Most importantly, no Mimbres Black-on-White was found in the Structure 2 excavations.

If we are not misled by sample size and other factors, Structure 2 was occupied before the development of the local Santa Ana Polychrome tradition, and before local acquisition of Mimbres Black-on-white as a trade ware. The sherd data therefore support our impression that Structure 2 was the oldest structure excavated in 1999, and offers a clue about what pre-A.D.

1100 (roughly speaking) Viejo period pottery assemblages might look like in the southern zone of the Chihuahua Culture area.

The next three items are not included in the ceramic counts and percentages in Tables 14 and 15. A ceramic animal head was found in Unit 51, Level 3 (Lot 9184), above and outside the northeast quadrant of Structure 2 in the excavation fill. The fragment is 5 cm long; the neck portion is more or less cylindrical (4 cm long, 1.9 cm diam.); the head occupies the “upper” 1 cm of the fragment, measures 2.2 cm from the nose to the back of the head, and measures 2 cm side to side. The ears and nose were modelled fairly clearly; the face includes the suggestion of one eye.

The same lot yielded a ceramic pellet, 1 cm in diameter.

A red-slipped sherd with a ground edge was found in the fill of Structure 2 (probably Lot 9176).

Flaked and Ground Stone

Functional Items

Our identification of flaked stone materials was often quite generalized, but Julia Mannard carried out an analysis of flaked stone categories by material for Unit 13, Structure 2 (Table 16). The analysis included 32 pieces from Level 2 (Lot 9094), 63 pieces from Level 3 (Lot 9099), 33 pieces from Level 4 (Lot 9101), and 11 pieces from Level 5 (Lot 9129). Rhyolite was the most common raw material, followed distantly by basalt (but one piece of basalt, weighing 87.6 g, was the largest item in the assemblage). Few cores were present, as were few pieces of non-igneous stone. There did not appear to be noteworthy changes in flaked stone categories or materials by level. As we have reported for other sites of the southern zone, the Calderón site flaked stone reflects an expedient technology with few shaped tools or obviously worked or utilized pieces.

Table 16. Flaked Stone from Structure 2, Test 13.

	Rhyolite	Basalt	Chert	Chalcedony	Obsidian	Quartzite	Tuff
Flakes	79	7	3	1		1	
Debitage	42						
Cores	3			1	1	0	1
Total	124	7	3	2	1	1	1
Total weight (grams)	164	99	7	2	3	< 1	20

The shaped tools tended to be made of rarer materials with better fracturing qualities than the omnipresent rhyolites and basalts. Three projectile points come from the fill above the roof and wall fall of Structure 2, a fourth from outside the structure (Table 17).

Table 17. Projectile Points from the Structure 2 Excavations.

Lot	Unit	Level	Material	Description
9052	6	1	White Chert	Complete, side-notched, wide convex base; 1.6 by 1.2 by 0.3 cm
9068	6	3	Obsidian	Mid-section; broken at notches; 1.6 by 0.9 by 0.3 cm
9089	9	3	Pink Chert	Slender; missing below shoulder/notching; 2.0 by 1.1 by 0.2 cm
9311	56	5	Fine-grained basalt	Complete; side-notched; from lower fill outside Structure 2

Twelve ground stone objects were associated with the Structure 2 excavations (Table 18). All were made of basalt exhibiting different degrees of vesicularity.

Table 18. Ground Stone Artifacts from the Structure 2 Excavations.

Lot	Unit	Level	Artifact	Measurements
9087	9	2	$\frac{3}{4}$ grooved axe fragment	11.5 by 10.8 by 7.3 cm
9071	6	4	$\frac{3}{4}$ grooved axe	21.5 by 10.5 by 5.7 cm
9169	6	5	Mano—complete	15.2 by 11.2 by 8.9 cm
9142	43a	3	Stone bowl fragment	18.0 by 15.8 by 11 cm
9142	43b	3	$\frac{3}{4}$ grooved axe	15.4 by 7.7 by 6.3 cm
9159	43c	4	Stone bowl?	5.4 by 4.6 by 2.6 cm
9184	51a	3	$\frac{3}{4}$ grooved axe	14.7 by 7.5 by 5.5 cm
9184	51b	3	$\frac{3}{4}$ grooved axe	13.3 by 10.0 by 5 cm
9184	51c	3	Stone ball	7.1 by 6.6 by 6.7 cm
9184	51d	3	Mano—complete	25.5 by 11.0 by 7.0 cm
9129	13	5	Stone bowl	22.8 by 15.5 by 6.8 cm
9233	54	4	Mano—complete	19.3 by 9.7 by 5.2 cm
9261	55	5	Mano—complete	15.5 by 11.4 by 7.5 cm

Axes were unusually abundant in the Structure 2 excavations, but all were found in the fill postdating the occupation of the structure. Four of the five axes were three-quarter-grooved. The fifth (No. 9184-b) had shallow grooves on both sides and deeper grooves across the top and bottom faces. One axe (Lot 9087) was broken behind the groove; the others were complete specimens with various amounts of battering and damage to the bit ends.

A fragmentary stone bowl from Level 3 (Lot 9142) had 3 cm thick walls and an 8 cm deep central depression. A second stone bowl was part of the floor assemblage near the hearth in Unit 13 (Lot 9129). This complete specimen was oblong, with an irregular depression (Figure 31). The bowl was 24.9 cm long and 15.5 cm wide, and the depression was 4.5 cm deep.

The complete mano recovered from Level 3 of Unit 51 (Lot 9184) is well ground, with a large, slightly convex grinding area measuring 24 by 10 cm.

The slender complete mano from Unit 54, Level 4 (Lot 9233) had broken *in situ*, into two pieces; the grinding area covers most of a slightly convex surface face and measured 19 by 9 cm.

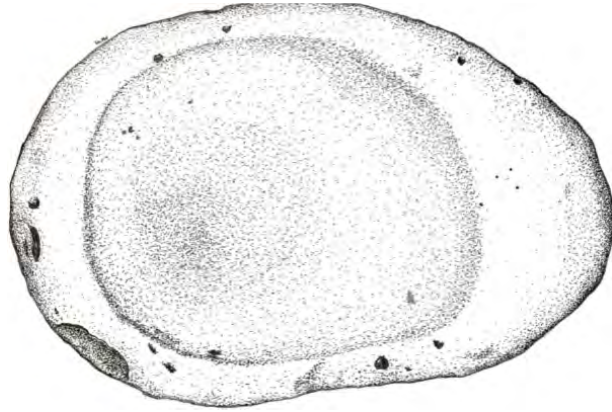


Figure 31. Ground stone bowl from the floor of Structure 2. Found near the hearth. Unit 13, Level 5; Lot 9129. Drawing by Mitch Hendrickson.

The two manos from Level 5 (floor level) came from Units 6 and 55. The first (Lot 9169) does not have a well developed grinding surface but shows grinding on one face and one edge. The second (Lot 9261) is wider, is oval, and has a convex grinding surface that turns up at the sides (as occurs from use in a trough metate).

A spherical stone ball, shaped by pecking and grinding, came from Level 3 (Lot 9184, Unit 51).

The five axe/maul heads found in Level 3 probably pertain to an outdoor surface around Structure 4. The ground stone items possibly associated with Structure 2, or at least predating the occupation surface around Structure 4, are two manos, an axe head, and a stone bowl. Ground stone items actually associated with the occupation of Structure 2 are two manos and a stone bowl. Metates and metate fragments are conspicuous by their absence.

Figurine

An anthropomorphic figurine was found in Level 3 of Test 53 (Lot 9023) (Figure 32).

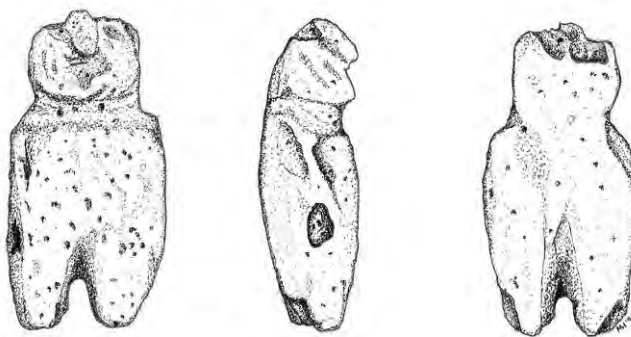


Figure 32. Stone figurine from the fill of Structure 2. Drawing by Mitch Hendrickson.

The figurine—most likely associated with the occupation of Structure 4—was made of highly vesicular basalt with a pink tint, was pecked and ground to shape, is badly weathered, and measures 8.8 by 4.6 by 3.7 cm. A natural hole extends from the back of the head to the lower side of the figure.

Ornaments

Table 19 summarizes the ornaments from Structure 2. The largest concentration of *Olivella* shells encountered by the PAC came from Structure 2 (n = 118). Most of these came from Levels 4, 5 (floor and immediately above), and 6 (subfloor) in the Feature G area of Unit 53; a few others came from adjacent Units 13 and 43. Seven of the 15 disk beads were found in upper fill; the others were found in lower fill, on the floor, or in Feature G, in much the same parts of the structure as the *Olivella* beads.

Table 19. Ornaments from Structure 2.

Lot	Unit	Level	Item	Description, Measurements, Comments
9129	13	5	4 <i>Olivella</i> beads	
9159	43	4	3 <i>Olivella</i> beads	
9205	53	5	55 <i>Olivella</i> beads	
9291	60	3	3 <i>Olivella</i> beads	
9325	53	6	53 <i>Olivella</i> beads	Feature G
9108	20	3	Thin disk bead	0.8 cm diam.
9129	13	5	Small disk bead	0.8 cm diam.
9159	44	3–4	Shell pendant	1.6 by 0.7 cm
9162a	43	3–4	Disk bead	1.6 cm diam.
9162b	43	3–4	Disk bead	1.2 cm diam.
9162c	43	3–4	Disk bead	1.1 cm diam.
9169	6	5	Pendant?	Igneous flake with hole; 1.9 by 1.3 by 0.4 cm
9204a	53	4	Disk bead	Off-center hole; 0.9 by 0.3 cm; hole 0.2 cm diam.
9204b	53	4	Rough disk bead	0.7 cm diam.
9204c	53	4	Rough disk bead	0.8 cm diam.
9204d	53	4	Rough disk bead	0.8 cm diam.
9205a	53	5	Rough disk bead	0.7 by 0.8 by 0.2 cm
9205b	53	5	Disk bead	0.6 cm diam., 0.2 cm thick
9205c	53	5	Disk bead	0.7 cm diam., 0.2 cm thick
9205d	53	5	Pebble pendant	1.5 by 1.0 by 0.6 cm
9214	54	3	Disk bead	0.8 cm diam., 0.3 cm thick
9233	54	4	Vermetid tube bead	6.5 cm long; 1.1 cm diam.
9235	54	5	Disk bead	0.8 cm diam., 0.3 cm thick; hole 0.2 cm diam.
9267a	56	2	Shell pendant	From valve hinge section; 4.5 by 1.0 cm
9267b	56	2	Turquoise bead	Oblong; pale green; 0.9 by 0.6 by 0.2 cm
9268	57	3	Disk bead	0.6–0.8 by 0.2–0.4 cm; hole 0.3 cm diam.
9270	58	4	<i>Glycymeris</i> bracelet frag.	3.7 by 0.5 by 0.3 cm
9325	53	6	Disk bead	Feature G; 1.0 by 0.4 cm; hole 0.2 cm diam.

The disk beads identified as “rough,” from Unit 53, Levels 4 and 5, were just that—roughly finished on one face, suggesting either shoddy workmanship or that the site was a locale for finishing such items. Three of the rough disk beads from Level 4 were stuck together, seemingly with the same substance that created highly resistant surface deposits on many items from that part of the structure. We suspected that this post-occupational adhesive consisted of residue from.

The small stone disk-shaped beads found here and throughout the site resemble the ones Di Peso describes from the Paquimé area (Di Peso et al. 1974). Likewise, the pendants found in Structure 2 (an unusual one is shown in Figure 33) tend to resemble the ones recovered by Di Peso.

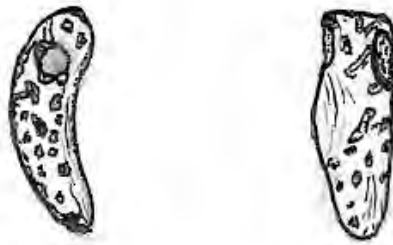


Figure 33. Shell pendant from Structure 2. Identified as *Spondylus* by Ronna Jane Bradley. Unit 13, Level 5 (Lot 9159). Drawing by Mitch Hendrickson.

The rodent disturbance within Structure 2 obscured the original context for these ornaments. Our initial expectation was that the concentration of ornaments would be associated with a burial, but the adult burial intruded into Structure 2 was not their source. The ornaments’ concentration in the lowest excavation levels, mostly below the structural debris that characterized Level 3, strongly suggests that they were somehow associated with the occupation of the house. Furthermore, we suspect that during that occupation, an infant was buried in the Feature G area, given the infant metatarsal found there.

Other Artifacts

Unit 9, Level 1 (Lot 9074) yielded a chunk of turquoise 1.3 cm long and 0.9 cm wide and thick. The chunk has a cut mark or groove along one side; otherwise the piece is unworked.

Unit 53, Level 3 produced a thin piece of mica that measured 0.9 cm long and 0.7 cm wide.

Bone artifacts were quite rare at Ch-254; most came from the Structure 2 excavations. The first item listed in Table 20 was made from deer bone; the other three items listed there may have been made from the same material. Of particular interest are the eyed needle (the only such item encountered in our research) and the fishhook (also the only one found by the project) (Figure 34). The fishhook twists slightly to the left when viewed facing the hook end.

Table 20. Bone Artifacts from the Fill of Structure 2.

Lot	Unit	Level	Artifact	Measurements	Comments
9052	6	1	Worked long bone	7.2 by 2.3 by 0.9 cm	Polished edge
9070	6	2	Metapodial awl	9.2 by 1.8 by 1.2 cm	
9089	9	3	Eyed needle	13.8 by 0.8 by 0.4 cm	Eye is 0.4 cm diam.
9282	57	4	Fishhook	1.6 by 1.28 by 0.3 cm	Proximal end broken



Figure 34. Two bone artifacts from the Structure 2 excavations. Left: eyed needle. Unit 9, Level 3; Lot 9089. Photo 99-21-18. Right: Bone fishhook. Unit 57, Level 4; Lot 9282. Drawing by Mitch Hendrickson.

Vertebrate Remains¹

The Structure 2 excavations yielded bones from a variety of vertebrate species, including mammals, birds, amphibians, reptiles, and fish. Most of the faunal elements from the Structure 2 excavations were found in or above the structural debris of Levels 3 and 4. These levels post-date the occupation Structure 2 and are partly contemporary with Structure 4. At those levels, turkey, marten, and canid bones were recovered, as well as three partly articulated skunk skeletons (in Test 13, Level 3). The skunks probably died in a den (indicated by a matrix of softer soil) created well after site abandonment.

Bone preservation was excellent, with more than half of the elements assigned Stage 1 or 2. For most of the elements, both bone surfaces were at the same weathering stage. The even weathering suggests that the bone was covered soon after deposition.

A variety of presumably mammalian bones were found in various stages of fragmentation, suggesting processing activities. Some of the bones in Level 3 were burned.

¹Two students conducted faunal analyses of materials from the Calderón site, as part of a University of Calgary faunal analysis course taught by Dr. Brian Kooyman. Andrea Gracey analyzed Structure 2 materials, while Hollie Brooks analyzed Structure 4 materials. Dr. Kooyman checked their tabulations and identifications, and deleted geographically improbable identifications of pika and wolverine. Many of the identifications were at fairly high taxonomic levels due to the lack of a comparative collection of Chihuahua fauna. Ms. Gracey's findings are summarized here.

The large mammal bones, presumably deer or antelope but possibly also including bear, are usually burned fragments. The minimal amount of large mammal bone suggests limited use of such animals, or butchering off-site. Among the small to medium-size species, almost all body parts are represented, suggesting that whole animals were processed on the site.

The most distinctive bones from the Structure 2 excavations are two bird long bones (one incised; from Levels 4 and 5) and a canid mandible that may be from a dog (from Level 3). The mandible held two teeth and a third tooth was found next to it.

Food Shell

Shell fragments from a local mussel were found in abundance. Dr. Arthur Vokes of the University of Arizona identified the shell fragments as *Anodonta Californiesis*, an edible fresh water bivalve. This could have been a year round resource. Based on its general abundance throughout the site, we believe it was locally available along the arroyo El Pino. Although we did not observe any living examples of this species near the site, people living in Oscar Soto Maynez told us of collecting mussels along the arroyo until about twenty years ago—when the mussels disappeared.

Macrobotanical Remains

The hearth in Structure 2 contained burned charcoal and other vegetal material that was clearly associated with the occupation of Structure 2. The contents of the hearth were sealed beneath two large chunks of adobe, which appeared to have been placed over the hearth in order to seal it. Unit 9, Level 5, near the hearth, produced a burned corn kernel just above the floor. Immediately northwest of the hearth, on the floor, charred remains of reeds seemed to be part of a mat.

The fill above Structure 2, particularly Levels 3 and 4 of Units 9 and 20, produced large quantities of burned beans and maize. These remains were found above the roof and wall fall associated with Structure 2, and came from deposits tentatively associated with the occupation of Structure 4. The burned beans and maize appear to have been deposited in a single discard episode, perhaps as a burned granary was being cleaned out.

Human Remains

The skeleton of an adult male was found in the southwest corner of Structure 2 (Units 54 and 55). The individual was buried in a pit (that had been intruded into the structure after its occupation) in a flexed position, without durable grave goods, and is discussed more fully in the chapter on human remains from the site.

Several carpals and vertebrae of a human infant were also recovered, in Tests 9 and 20, and an infant or juvenile metatarsal was found in the fill of Feature G.

As is discussed in Chapter 20, isotopic analysis of the human remains provided some indications of prehistoric diet.

Discussion

Structure 2 was one of the older structures at the Calderón Site, being of much the same age as Structures 5B II or 5C. Unlike Structure 1, Structure 2 did not have an adobe wall base. Mud daub was placed against the north wall of the pit and into this plastic mass were inserted small Douglas fir poles. The slant of the poles suggested a domed structure. It may be that such construction once encircled the entire house; on the east side of the house, the floor plaster continued up the shallow pit wall in a fashion consistent with that seen along the north wall. However, pit walls and wall construction could not be determined for the south and west sides of the house.

Whatever the shape of the superstructure, it included two main support posts aligned northwest-southeast. The southeast main support post seems to have been augmented by auxiliary posts (Feature G). The northwest main support post (Feature I) may also have consisted of more than one post, given the size of the post hole. Any lateral entrance probably faced southwest and was disturbed by the burial in that part of the structure.

A single layer of floor plaster was found over much of the dish-shaped floor (and a substantial caliche patch was found in one area). In contrast, several floor levels were found around the collared basin hearth. Like other hearths at southern zone Viejo period sites, the Structure 2 collared hearth was in the eastern portion of the building. The hearth was sealed by pouring a rather fluid mix of mud or daub into it and adding a few rocks.

The plastered pit that formed part of Feature G was a mystery. An infant or juvenile human metatarsal was found at floor level, along with a tight cluster of shell beads, suggesting the presence of a burial, but no such burial was found. In our experience, the pits for local burials are not plastered. It remains unclear why a plastered pit was present at the southeast main support post.

Foodstuffs were not prominent in the floor assemblage, but a maize kernel was found near the hearth. As the isotopic analysis of human bone shows, the local economy depended heavily on maize.

The structure appears to have been abandoned in an orderly way. The hearth was sealed, and there may have been some removal of house contents and scavenging of building materials before the final burning.

After the house was abandoned, the superstructure collapsed into the pit and thus created the lower levels of the feature fill. A hard-packed surface then formed over the area. The location of the former Structure 2 became part of a larger extramural activity area—most likely for Structure 4, which overlapped the southeastern part of Structure 2 (Figure 21). The activity area included two features with central flat stones and surrounding smaller stones (Features K and F); one

included signs of burning, so may have been a hearth, but the other did not and its function is unknown. Artifacts discarded on the hard-packed surface included metates and manos, axes, projectile points and other flaked stone, pots, ornaments, the stone figurine, and the eyed needle and bone fishhook. Faunal remains and charred corn and beans were also found in this general level of the feature fill. In addition, Burial 1 was placed in the area.

Structure 2 is early, probably 10th century A.D. (see the discussion of radiocarbon dates later in this report), predating the advent of local polychrome pottery and the importation of Mimbres black-on-white vessels. Structure 2 is of interest in part because it featured construction details not found in other Viejo period structures of the southern zone.

Chapter 6

STRUCTURE 3

Structure 3 was south of Structures 1 and 2, on the same low rise as those two structures (Figure 12). The grid coordinates for Structure 3 ranged from N166 to N174 and E204 to E210. Twelve units were excavated here, exposing 22 m² (Figure 35). The fill was excavated in three levels. Level 1 consisted of the loose part of the plow zone. Level 2 was more compact, but also had been disturbed by plowing. Level 3, extending to the well-plastered (in places) floor, was marked by red- to orange-tinged soil. The floor of Structure 23 was encountered 35 to 45 cm below the modern surface. The integrity of Level 3 seems to be considerably greater than that of the uppermost two levels, but plow marks were found in the plastered floor.



Figure 35. Plan of Structure 3.

Unit 21, the first of this excavation, was begun in order to search for the source of human bone fragments on the surface of this part of the mound. The testing exposed a well-plastered floor and was expanded to trace the floor. Neither walls nor the floor limits were positively identified by the end of the field season; in areas that appeared to represent the edge of the floor, such as in Unit 48, it appeared that plowing had destroyed any pit walls. Units 46 and 47 were excavated to Level 4 without finding a floor. The burial in Units 49 and 50 extended into Level 4.

Architectural Details

The floor was carefully plastered. Adobe and *bajareque* occurred in the fill but were not uniformly distributed. Unit 40 contained a large amount of adobe or daub that had burned at very high temperatures. The floor under this almost vitrified adobe was orange; at first we wondered if the orange area represented an informal hearth, but we concluded it oxidized when the structure burned. The floor in this area was roughened, cracked, and scratched.

The floor was missing in a number of areas, and some of missing areas could have represented post locations. The pattern was quite irregular, however, and we found no evidence of wood where the floor was missing. Given the large amount of disturbance, we concluded that the “holes” in the floor were due to burrowing and plowing.

A flat metate fragment was plastered into the floor. Two smaller stones flanked the metate fragment, in a manner reminiscent of the arrangement of Feature K (also a metate fragment, in the upper fill of Structure 2).

Pottery

More than half of the sherds (63 percent) were found in disturbed Level 2 (Tables 21 and 22). Another one-quarter (27 percent) of the sherds were found in Level 3—a notably larger percentage of sherds near the floor than was the case for Structures 1 and 2. The presence of both Mimbres Black-on-white and Santa Ana Polychrome immediately above the floor suggests that these types are associated with the occupation of this structure, and therefore that Structure 3 falls late in the occupation of the site.

Table 21. Sherd Counts for Structure 3, by Level.

Level	Undec.	Black	Red-slipped	Red-on brown	Text.	Poly-chrome	Other	Mim-bres B/W	Total	Total Weight (grams)
1	339	35	11	39	75	11	4		514	1510
2	2291	226	78	210	444	72	14	1	3336	13445
3	894	199	56	79	165	6	6	1	1406	6829
4	20	8	2						30	162
Total	3544	468	147	328	684	89	24	2	5286	21946

Table 22. Sherd Percentages for Structure 3, by Level.

Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Mimbres B/W	Other
1	65.0	6.8	2.1	7.6	14.6	2.1		0.7
2	68.7	6.8	2.3	6.3	13.1	2.1	< 0.1	0.4
3	63.6	14.1	4.0	5.6	11.7	0.4	< 0.1	0.4
4	66.7	22.2	11.1					
Combined	67.04	8.9	2.8	6.2	12.9	1.7	< 0.1	0.5

Other Artifacts

Table 23 summarizes the other artifacts from the Structure 3 excavations. Two small stone disk beads and a bone awl fragment were recovered from Levels 2 and 3 and are presumed not to pertain to the occupation of the structure. The “ceramic appliqué” from Unit 44, Level 3 was a pointed coil appliquéd to some ceramic object. Figure 36 shows one of the two sherd spindle whorls from the excavation of Structure 3.

Table 23. Other Artifacts from Structure 3.

Lot	Unit	Level	Item	Measurements, Description
9145	45	2	Disk bead	0.7 cm diam, 0.2 cm thick; hole 0.2 cm diam.
9138	41	3	Disk bead	0.9 cm diam., 0.4 cm thick; hole 0.3 cm diam.
9165	46	2	Bone awl tip	9.2 by 1.4 by 0.8 cm
9163	44	3	Spindle whorl	6.4 by 6.1 by 0.8 cm; patterned incised with red-slipped area
9163	44	3	Spindle whorl	5.4 by 5.0 by 0.5 cm; faded Mata Red-on-brown
9163	44	3	Ceramic appliqué	3.0 by 1.0 by 0.6 cm; unslipped

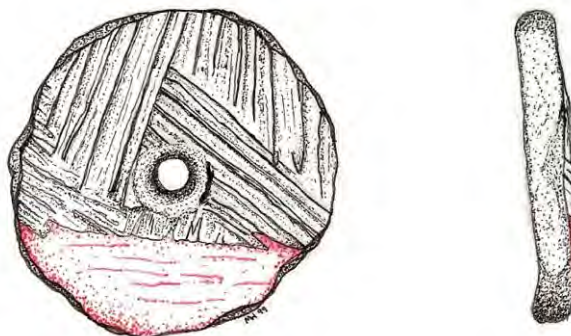


Figure 36. Spindle whorl made from a sherd combining patterned incisions with red slip. Hole is biconically drilled. No. 9163-1 (Unit 44, Level 3).

Human Remains

Human remains from the Structure 3 excavations included scattered bone and Burial 3.

The scattered human remains, which were concentrated along the eastern margin of the excavations, included tooth remnants, skull and pelvis fragments, and phalanges. All were in the upper levels, and presumably came from a burial scattered by plow action (and perhaps also by animal activity).

Burial 3 was placed after Structure 3 had burned, and the burial pit intruded through the floor (Figure 37). There were no grave offerings. The top of the burial pit had been disturbed by plowing. This adult burial is more fully described in the section on Human Remains; see Chapter 20 for the isotope-based dietary study.



Figure 37. Burial 3. View to the south.

Discussion

Structure 3 was a habitation structure probably built and occupied late in the site's history. Information about this structure is incomplete because the field season ended before it could be excavated completely. The somewhat discontinuous floor included only one feature associated with the occupation of the structure: a metate fragment plastered into the floor. One interesting discovery was the intensely burned floor patch that suggests that very hot temperatures were achieved when the structure burned (also that there was no post-abandonment fill in the structure when it burned).

Plow disturbance reached the floor in places, but the matrix of the fill directly above the floor seemed to be different from the looser plow zone material above it (and seemed to have some depositional integrity). The sherds from Level 3 reinforce the stratigraphic evidence that this

structure was occupied late in the history of the site. Level 3 yielded Santa Ana Polychrome and Mimbres Black-on-white.

We inferred that Tests 1 and 2 (north of the North Arroyo, and excavated in 1998) had exposed the remnants of a surface or near-surface jacal structure. Structure 3 may have been a similar structure. The site continued to be occupied after this structure burned, at least long enough for one individual to be interred in the burned-out and filled-in structure.

No grinding tools or axe heads were recovered in the Structure 3 excavation units, and botanical and faunal materials were quite rare, as might be expected due to the shallow depth of the deposits.



Chapter 7

STRUCTURE 4

Structure 4 is south-southeast of Structure 2, which it partially overlies. The floor of Structure 4 was first identified in the south profile of Test 53, during the Structure 2 excavations. The superposition of one structure over the other provided an excellent opportunity for comparisons over time. Once the edge of Structure 4 was detected, we opened a 1.5 by 2 meter pit (Test 59) south of Test 53 to explore the newly found structure. Test 59 exposed the floor and part of the edge of Structure 4. Other units were opened to expose other parts of the structure.

The top edge of the dish-shaped floor of Structure 4 was 45 cm above the floor of Structure 2, but the central part of the floor of Structure 4 was only 17 cm above the floor of Structure 2.

The stratigraphy of the fill above Structure 4 was straightforward, and very much like Levels 1 to 3 above Structure 2. That is, Level 1 was the loose plow zone, while Level 2 extended from the bottom of the loose plow zone material to the top of the roof and wall fall. Structural debris, extending to within 5 cm of the floor, was designated Level 3. Level 4 consisted of the fill directly above (and associated with) the floor of the structure. Sub-floor tests were designated Level 5.

Architectural Details

Structure 4 was a shallow circular pit house. Due to time constraints, only three-quarters of the structure was exposed. We excavated the center of the floor and to the floor edges in each of the cardinal directions. The estimated floor area was 38.5 m², about 7 m² of which was not excavated. Thus, Structure 4 was somewhat larger than Structure 2 and smaller than Structure 1.

Like Structure 2, Structure 4 was oriented west-southwest and it measured about 7 m in diameter (Figure 38). Its circular shape and saucer-shaped floor are also reminiscent of Structure 2. The roof support system differed dramatically, however. The roof of Structure 4 was supported by four large central posts, three of which were excavated (Figure 39). None of the posts had floor collars.

Post Hole 1 (Feature C, in Test 63) measured 35 cm in diameter and extended some 55 to 60 cm below the floor. The post had burned off at floor level. The post remnant sent to the Tree-ring Lab in Tucson and was identified by Jeffrey Dean as pine, but could not be dated. Several cobbles and pieces of ground were found at the bottom of the post hole. Below these footing stones, the soil was sterile.

South of Post Hole 2 (Feature D, in Test 66) was a large concentration of charred wood, probably representing burned above-floor pieces of the post. The Tree-ring Lab was unable to date the fragments from this post.

Posthole 3 (Feature E, in Test 65) was not excavated.

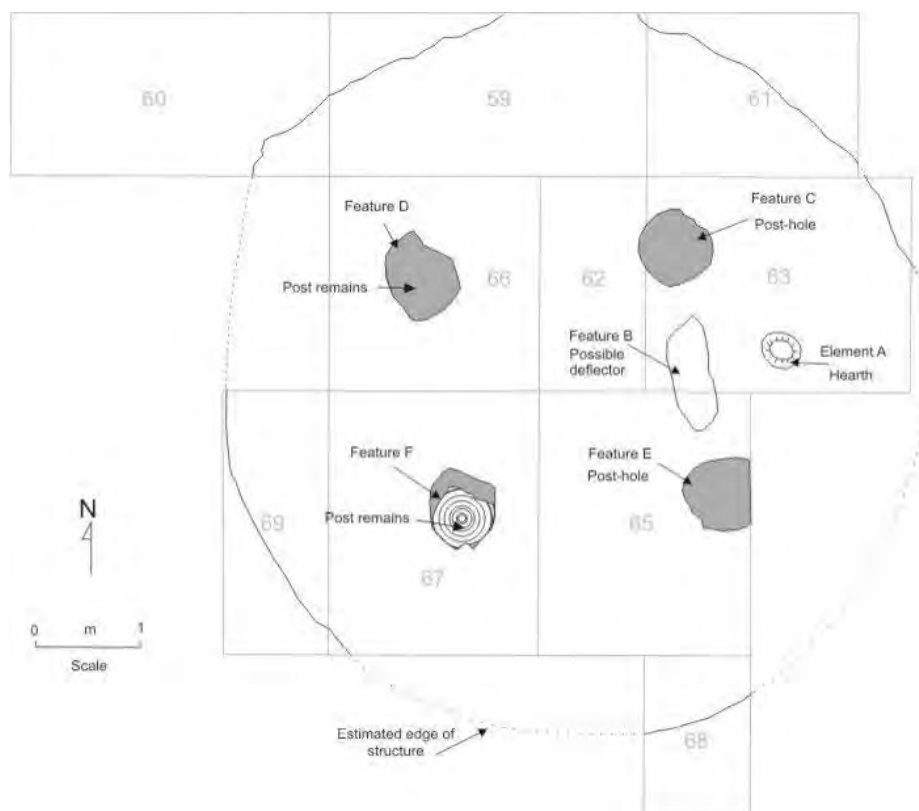


Figure 38. Plan of Structure 4.



Figure 39. Three of the Structure 4 post holes held charred posts. Post Hole 1 is Feature C, Post Hole 2 is Feature D, and Post Hole 4 is Feature F. Post Hole 3, Feature E, was not excavated.

Post Hole 4 (Feature F, in Test 67) contained part of the original post, reduced to about three-quarters of its original diameter. The post hole extended 76 cm below the floor but the remaining wood extended only about 25 to 30 cm below the floor. The lower part of the wood was unburned and partly rotted. The west edge of the post was sent to the Tree-ring Lab and proved to be pine, but again could not be dated. Several river cobbles, presumably footing stones, were found in the bottom of the pit. A few pieces of flaked stone, pottery, and bone were recovered from the post hole fill.

The wall and wall base had been destroyed by plowing, so the exact nature of the superstructure could not be determined. The remnant of an interior step, at the west-southwest edge of the floor, allowed to determine the probable location of the entry. The step remnant was a raised plaster area (10 cm higher than the floor) measuring 20 cm wide and 30 cm long. The sides were uneven, suggesting that the step may have been wider.

The floor plaster was 8 cm thick in the center of the house, extended to the walls, and was gray to dark gray. The floor was replastered several times; in one area we counted four layers of plaster (Figure 40); as many as six layers of plaster may have been present. The multiple plastering events suggests that the structure had a long use life and was remodeled several times.



Figure 40. Floor of Structure 4, showing four plaster floor levels. Photo 99-22-21.

Aside from the post holes, two floor features were identified.

Feature A, in Test 63, was the hearth. It was off-center, in the east part of the structure, in line with the probable entryway. The hearth measured 30 cm in diameter and was 15 cm deep; it had an adobe collar that was 10 cm wide and rose 5 cm above the floor. The hearth plaster was continuous with the floor plaster. The hearth fill was mixed charcoal and soil; small amounts of charcoal were found around the hearth.

Feature B, southwest of the hearth, was an adobe feature about 1 m long and 40 cm wide, rising 12 cm above the floor. We believe that this adobe feature was a low adobe deflector, as it was placed between the hearth and the entry. No other deflectors have been identified in this region; they are common in pit structures in the southwestern United States, but there the deflectors are generally at least 50 cm tall and often are made of stone.

Pottery

Black, red-on-brown, and textured sherds were most numerous in the lower levels (Tables 24 and 25). No Mimbres pottery was found at Structure 4, and no polychromes were found below Level 3. A possible pottery pipe fragment and a jar handle were among the ceramic items tabulated.

Table 24. Sherd Counts for Structure 4, by Level.

Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Other	Total	Total Weight (grams)
3	1639	247	122	124	246	15	26	2419	10322
4	641	90	39	60	121		6	957	4635.2
5	41	19	4	10	13			87	743.7
Total	2321	356	165	194	380	15	32	3463	15701

Table 25. Sherd Percentages for Structure 4, by Level.

Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Other
3	68.2	10.3	4.8	3.5	10.1	0.6	0.7
4	66.6	9.4	4.1	4.9	12.5		0.0
5	47.1	21.8	4.6	11.5	14.9		
Total	67.0	10.23	4.8	5.6	11.0	0.4	0.9

A pottery spindle whorl was found resting on the floor of Structure 4 (Test 63, Level 4; Lot 9330). The spindle whorl was 40 cm southeast of the hearth, next to a corrugated sherd. The spindle whorl made from a thin sherd of black ware (polished on both surfaces) measured 5 by 4.9 cm in diameter, and was 0.7 to 0.8 cm thick. The biconically drilled hole was 0.6 cm in diameter.

Other Artifacts

A crude, barely worked obsidian point was found in Unit 61, Level 3 (Lot 9295). A rhyolite scraper from Unit 62, Level 3 had edge modification or use (or both) along all of its edges (Lot 9298).

Three pieces of ground stone were recovered; all three were made of vesicular basalt. The item from the fill (Unit 59, Level 2; Lot 9350) was a mano fragment with a slightly convex grinding surface; it measured 9.2 by 6.5 by 6.3 cm. A second mano fragment from Post Hole 1 (Feature C) was triangular in cross-section and had two grinding surfaces; it measured 11.6 by 8.3 by 4.4 cm (Unit 63, Level 5; Lot 9346). A possible polisher from the same context and lot had a triangular cross-section, with one surface ground flat; in this case the basalt was highly vesicular. This last item measured 7.5 by 3.8 by 3.2 cm.

In Test 65, Level 4, two concentrations of burned vegetal materials may have been the remains of one or two burned reed floor mat(s) found in situ (as happened in Structure 2). The first concentration measured 50 cm by 35 cm, the second 50 cm by 45 cm. Karen Adams later examined the materials and identified two sections of two-ply S-twist cordage, one of which was tied around a larger piece of monocot (Figure 41).



Figure 41. Two pieces of cordage from Structure 4. Left: strand of two-ply S-twist cordage made from monocot fibers, photographed at 10X magnification. From Burned Mat No. 2, Structure 4 floor. Photo 99-47-10. Right: piece of monocot wrapped with a strand of two-ply S-twist cordage also made of monocot fibers, also from Burned Mat No. 2, photographed at 10X magnification. Photo 99-47-08. Photos by J. D. Stewart and K. R. Adams.

Faunal Remains

The Structure 4 faunal elements were studied by Hollie Brooks at the University of Calgary, under the direction of Dr. Brian Kooyman. The 163 identifiable faunal elements (Table 26) presented quite a different pattern from that seen in Structure 2. A variety of skeletal parts were represented. This, and the large amount of animal disturbance we observed, led us to conclude that the bones are mostly post-occupational. In fact, a mummified rodent was found in Level 4.

Most of the bones were fractured; 27 of the bones from Structure 4 were burned. No butchering marks were observed on any specimens. Three elements appeared to be sawed, but the inferred saw cuts lacked visible striations. The deer/antelope bones are low value bones such as phalanges.

Table 26. Faunal Remains from Structure 4.

Phylum	Category	NISP	MNI	Percent
Rodents	Combined			16
	Ground squirrel	11	2	
	Pocket gopher	7	1	
	Vole	4	2	
Birds	Combined			17
	American Coot	10	2	
	Grouse	4	2	
	Turkey	3	1	
	Owl	1	1	
	Mallard	1	1	
	Red-winged Blackbird/Kildeer/Plover	2	1	
	Blue-winged Teal	1	1	
	Passeriform	2	1	
Mammals	Combined			43
	Cottontail	37	3	
	Deer/antelope	16	1	
	Jackrabbit/hare	3	1	
	Skunk	2	2	
	Marten	1	1	
	Wolf	1	1	
	Fox	1	1	
	Mammal NFS	4	3	
Amphibian/ Reptile	Combined			12
	Frog/lizard	2	2	
	Snake	15	1	
Fish	Fish quadra	1	1	

The faunal remains represent a few elements each from a fairly wide range of taxa, considering the size of the assemblage. The picture that emerges is primarily one of garden hunting of cottontails, hares and artiodactyls, with some bird species taken. Of particular interest is the relative importance of American Coot, a species that was prominent in the faunal assemblages from El Zurdo (Ch-159) near the Laguna Babicora basin (Hodgetts 1996).

Macrobotanical Remains

The most common remains identified from macrobotanical and flotation samples were wood (pine, juniper and oak). *Yucca* and *Phragmites* (reed) were also identified, as was *Zea mays*. The burned mat-like remains in Unit 65 were made of monocot fibers.

Human Remains

The faunal studies also identified human bones from Structure 4. These included three first phalanges, a second or third phalange, a rib, and three teeth. All of these could have come from a single individual. We suspect that the original burial (or burials) was outside the structure and that the bones were dragged into the excavation area by a plow.

Discussion

Structure 4 partly overlay, therefore was younger than, Structure 2. Structure 4 was a shallow house with a four post roof support system and a possible deflector in front of the fire pit. As is common in the area, the fire pit was towards the east side of the house.

The items found in Level 3 of the fill above Structure 2 could have been derived from the daily activities of the inhabitants of Structure 4. Few artifacts were found on the floor of Structure 4, or in the roof and wall fall. The meager floor assemblage consisted of a ceramic spindle whorl, a corrugated sherd, and a burned mat or mats. The structure had burned but the lack of a floor assemblage suggests that the burning was part of (or took place after) an orderly abandonment process.



Chapter 8

HUMAN REMAINS FROM THE 1999 FIELD SEASON

Monica Webster

Three burials were found during the 1999 field season. Burials 1 and 3 intruded into abandoned houses (Structures 1 and 3, respectively). Burial 2 was an extramural burial, found while excavating a trench between Structures 1 and 2. Burial descriptions and analyses of the human remains were by Monica Webster, who later conducted isotopic analyses to elicit information about the diet of the three individuals (Chapter 20).

Burial 1

An adult male was buried in an ill-defined pit that originated in the fill of abandoned Structure 2 and continued through the floor. The burial pit only became visible in Level 5. No objects accompanied the burial.

The human remains were 51 to 70 cm below the surface. The skull was encountered first, while the pedal phalanges were deepest. The body was placed in a flexed position, facing east, with the head to the north. The hands were crossed at the wrists in front of the face; the left hand was curled under the chin and the right hand was near the orbits. The long bones were well preserved but the ribs, vertebrae, and pelvis were in poor condition, and the pelvis could not be used for sexing. All long bone epiphyses were fused, and three molars were present.

The estimated stature of this individual is 149–157 cm, based discriminant function equations of the tibia and femur (Trotter and Bleser 1958, cited in Bass 1987). The upper limit was calculated from the tibia and represents a more accurate estimate than the lower estimate. The measurements for the lower limit were taken from an incomplete femur and had to be estimated. It is therefore likely that the actual stature of this individual was near the upper limit of 157 cm (± 33.7 cm). The muscle attachments of the tibia, femur, radius, ulna, humerus, and metacarpals were large. Size of muscle attachment can be a good indicator of strength and high levels of activity during life.

Mild pathological lesions present on several of the bones indicate osteoarthritis. The bones most affected were those of the feet and the proximal ulna. In addition, the atlas was asymmetrical and had severe lipping on the left articular facet. This could be the result of trauma or osteoarthritis. Several of the teeth displayed caries. An Inca bone was present in the occiput.

In summary, this skeleton was from an adult male of small stature and large musculature, in relatively good health.

Burial 2

This individual was discovered in an extramural trench, between Structures 1 and 2. Preservation was poor, and the burial was disturbed by burrowing. The bones were disarticulated and some elements were missing. Burial 2 was flexed, with the head to the west. There were no identifiable grave offerings. The few sherds in the pit were probably part of the pit fill.

The long bones suggest burial of a single individual. There were, however, teeth from three individuals. One set of teeth included incisors, premolars, canines, and molars from an adult—presumably the individual represented by the non-dental bones. A second set of teeth included an incisor and two premolars from a child; these teeth were small and unworn. The crown of a deciduous molar in the process of development came from a third individual, estimated to be between the age of birth and 9 months.

The bones represent a somewhat robust and seemingly healthy individual. One femur exhibited a lesion that indicating a healed infected fracture. The surface of the bone was roughened, but the poor preservation did not allow more specific identification of the cause of the lesion. The fact that the bone had healed shows that that the injury had occurred before death.

Burial 3

The remains of an adult were found in a shallow pit dug into the floor of Structure 3. Although the top of the burial pit was destroyed by plowing, the burial was clearly made after the structure was abandoned: the top of the cranium was above the level of the floor. The subfloor part of the pit extended 31 cm below floor level. The burial pit measured 85 cm northwest-southeast and 55 cm at the widest. The individual was flexed, lying on his or her left side, with the upright head oriented to the northwest. It seems that those burying the body had trouble fitting the person into the small pit, because the right femur was dislocated from the acetabula. Toe bones and metatarsals were found along the side of the pit—another reflection of the difficulty of burying an adult in such a small pit.

This individual appeared to be in the 35–49 age range, based on cranial suture fusion and tooth wear. The age range is necessarily wide due to the variable timing of suture closing and the possible pathological condition of the skull.

At first, we assumed that this individual displayed evidence of fronto-occipital deformation. The skull was very fragile, and we could not definitely say that this sort of deformation was actually present. However, the uneven thickness of the skulls bones and the protrusion of the parietal sections of the cranium support the notion that the skull was artificially deformed.

This individual, like those in Burials 1 and 2, shows robusticity and the presence of osteoarthritic lipping (on the bones of the feet, the right os coxa, the distal humerus, and the bones of the hand). A large lesion on the left ulna was of the sort characteristic of osteoma, a benign bone tumor. These are usually found on cranial bones or at the ends of long bones (Ortner and Puschard 1985). This example is of interest, however, because the lesion was on the proximal shaft.

Considering the fact that osteomas are benign, this lesion is not likely to have been the cause of death.

Scattered Human Bones

Individual, scattered human bones were noted in Structures 2 and 4 (see Chapters 5 and 7).

Discussion

Three burials are a very small sample on which to base inferences. We can say that the three individuals were small-statured and were physically active. Their overall health appears to have been good, albeit all three skeletons show signs of arthritis. The observed lesions do not seem to be implicated in cause of death. Samples of bones from the three burials were exported for isotopic analysis.



Chapter 9

SUBSISTENCE AND RESOURCE PROCUREMENT: THE 1999 EVIDENCE

Karen R. Adams and Jane H. Kelley

From the PAC's beginning, subsistence and resource procurement were major research foci. Karen Adams, who was involved with the project from 1990 to 2000, made modern ecological observations and carried out botanical analyses. In 1999, as in all previous years, the crew routinely collected charred remains of plants. Because preservation is normally better in deeper deposits, and because we were focusing on structures and occupation levels, these obvious botanical samples were mostly collected from Level 3 and below. Macrobotanical remains were, in fact, quite sparse in the plow zone. Multiple bags representing 132 separate locations within the site (including three of the four structures) were submitted for examination.

All non-charcoal specimens were segregated and identified, and up to 10 charcoal fragments were identified for each context. A summary list includes 13 taxa (Table 27), plus unidentified materials.

Table 27. Charred Plant Parts Recovered as Macrofossils.

Taxon	Common Name	Part(s)
<i>Arctostaphylos/Arbustus</i>	Manzanita/Madrone	Charcoal
Conifer	Conifer	Charcoal
<i>Fraxinus</i>	Ash	Charcoal
Gramineae	Grass	Stem fragment
<i>Juglans</i>	Walnut	Charcoal, nutshell
<i>Juniperus type</i>	Juniper	Charcoal
Monocotyledon	Monocot	Cordage (most likely yucca)
<i>Phaseolus</i>	Domesticated bean	Cotyledon, bean
<i>Phragmites</i>	Reed	Stem fragment
<i>Pinus</i>	Pine	Charcoal
<i>Pseudotsuga</i>	Douglas fir	Charcoal
<i>Quercus</i>	Oak	Charcoal
<i>Salix</i>	Willow	Charcoal
<i>Yucca</i>	Yucca	Leaf fragment
<i>Zea mays</i>	Maize	Cob segment/kernel

At a minimum, the inhabitants were raising three kinds of domesticated plants (maize, common beans, and squash), and gathered walnuts and possibly yucca fruits.

The tree charcoal could easily represent fuel wood. This list includes juniper, manzanita or madrone, walnut, pine, Douglas fir, and oak. Construction timbers included pine (Structure 4)

and Douglas fir (poles in Structure 2). Finer structural materials included willow, reeds, and grasses.

Remembering that the samples are mostly from Level 3 and below (the exceptions are from Level 2 of Structure 3), the distribution of the remains is interesting. Of the 28 units in Structure 1, all but five produced *Zea mays*, usually from multiple levels. Of the 20 test units from combined Structures 2 and 4, only six did not produce *Zea mays*, and these were all in the Structure 4 part of the excavations. The lower ubiquity of *Zea mays* in Structure 4, as well as in Structure 3 (where only three of 12 units produced *Zea mays*) may be due to the shallowness of the deposits and plow and rodent disturbance in those strata. Botanical remains from deeper levels of the site suggest a high ubiquity for *Zea mays*.

Phragmites remains were found in seven units of Structure 1, from Levels 2 to 5. In Structure 2, reed fragments were concentrated in Levels 4–6 (in 10 of the 13 units). Structure 4 yielded only three instances of *Phragmites*, from Level 3 (n = 1) and Level 4 (n = 2).

Beans were tabulated for only three units in Structure 1, including one of the subfloor post holes. In Structure 2, beans were concentrated in Levels 3–5 of seven units.

Level 4 of Unit 57 (outside of the north adobe wall base of Structure 2) produced the only squash seed.

The three samples of yucca come from Structure 1 (Test 27, Level 3) and Structure 4 (Test 63, Level 4 [floor]; Test 65, Level 3).

In summary, the macrobotanical remains tended to survive in the deeper deposits. In such deposits, *Zea mays* was extremely widespread. Beans and squash are, typically, less common in the archaeological record, but were present.

Hunting was part of local food procurement. We infer that cottontails, jackrabbits, and deer were acquired through garden hunting. Rodents also seem to have been processed, given the presence of burned rodent elements.

A distinctive and possibly important food resource was *Anodonta Californiensis*. Shell fragments from this bivalve were mentioned in the field records for most excavated units in the site, with concentrations in the lower fill of Structure 1 and in Units 62 and 63 of Structure 4. Arthur Vokes of the University of Arizona tells us that this species is available and edible year round. We did not observe living populations of *Anodonta Californiensis*, but local residents remember collecting fresh water mussels from the El Pino drainage within the last 20 years. The large amounts of mussel shell, combined with the fish hook we found and amphibian and fish bones, indicate that riverine resources were part of the inhabitants' subsistence regime. Although *Anodonta* shell was sometimes made into jewelry by prehistoric populations (the valve interiors are nacreous), no evidence of such use was seen at the Calderón site. As a final comment, the recent loss of the local *Anodonta* population probably reflects an ongoing process (on both sides of the border), now spanning generations, in which human water use has severely degraded riparian biotic communities.

The plant and animal resources we documented were available locally, or available not far from the site. People who remember the Santa María valley before the big haciendas were broken up are unanimous in saying that the basin was formerly much more wooded than it is today, and that woodlands extended more or less across the basin and down to the river's main channel. Today, oak woodland (where oak, madrone, manzanita, juniper, and yucca grow) is found on upper bajadas and along mountain fronts less than 10 km from the site. Willows, ash trees, walnuts, and reeds grow in the riparian and adjacent communities next to the site, with the tree species following water courses across the basin. Wood from larger pines and Douglas firs must have come from the mountains to the west. The firs would have preferred canyons deep within the mountains, where cold-air drainage took place.



Chapter 10

GPR-BASED STUDIES: INTRODUCTION AND 2005 RESULTS

J. M. Maillol and Jane H. Kelley

The main objective of the 2005 studies at the Calderón site was to evaluate the application of ground-penetrating radar (GPR) in the identification of houses and other buried features. Given the local archaeology and geology, we anticipated that the GPR signals would not need to penetrate more than 1.5 m. The method has been used successfully in similar archaeological contexts in the U.S. Southwest (Conyers and Cameron 1998), at Galeana (Cruz Antillón et al. 2004), and in geophysical studies in Chihuahua (Ortega Ramírez et al. 2002).

Dr. José Ortega Ramírez (INAH) and Dr. Jean Michel Maillol (University of Calgary) used two different GPR devices and a magnetometer to determine which one was most suited to local conditions (Figure 42). The University of Calgary GPR device proved to be more useful for our purposes, for two reasons. First, it was mounted on a cart, which made surveying much faster than with the INAH hand-carried machine. Second, the device's operating frequency produced a higher quality image.



Figure 42. GPR survey devices. Left: Calgary device. Right: INAH device.

The magnetometer was tried only at the Calderón site. Dr. Ortega and his student undertook an intensive survey of a 10 by 10 m area in the northeast part of the site, where no GPR anomalies had been identified. We then placed a test pit at a location with magnetic anomalies (Figure 43), and found large sherds and pieces of flaked stone lying horizontally on an occupation surface. Clearly, the magnetometer had located a surface not detected by GPR.



Figure 43. Unit 7, placed to test magnetic anomalies.

Although it would have been useful to employ both magnetometry and GPR during the subsequent fieldwork, the magnetometer returned to Mexico City with Dr. Ortega.

Ch-254 was picked as the best site for experimenting with the GPR because of our previous excavations. We reasoned, erroneously, that the previously dug structures would show on the GPR images and because these structures were of known depths, it would be possible to calibrate the machine. In fact, the three previously dug structures did not appear on the GPR scans, and Structure 1 was re-identified only by knowing its location. A lesson learned: at this site, at least, backfilled areas were not suitable for detecting GPR anomalies.

The resolution of GPR signals lessens with depth. In this case, the depth of archaeological materials was less than 1.5 m, so we could use a Sensors & Software Noggin 500 MHz device at a high frequency. The signal antenna and receptor were mounted on a low cart with an odometer. In each of the sites surveyed, we covered sections of 50 by 25 m at 0.5 m intervals. Data were collected every 2.5 m, the usual distance for 500 Mhz. The maximum data collection time was 30 ns (in order to augment resolution). Some 2000 data groups were collected in each transverse. Each 50 by 25m section contained 52 transverses, with duplication during some passes.

Following data collection, specific methods were used to amplify signals and correct errors in the position of the equipment. The groups of data were then compiled into a data set for the area surveyed. This enormous data set can be used, in turn, to create maps in three dimensions and to whatever depth is desired. Under ideal conditions, the resulting pixels each represent a 10 by 10 cm area. For the depths that interest us, the actual pixel resolution is 12 by 20 cm. Horizontal “cuts” (by depth) are the best way to analyze the imagery but on occasion, later in the analysis,

we looked at vertical “cuts” through anomalies. Also, to better understand the relationships between anomalies in GPR scans and subsequent archaeological findings, occasionally we ran two sets of traverses at right angles and at closer intervals, prior to excavating the anomaly (Lacroix 2009).

In 2005, the GPR was successfully used on three sites in the Santa María Valley (Ch-254, Ch-218, and Ch-312) and one site in the Santa Clara Valley (Ch-240). In 2008 we resurveyed Ch-218 (with results virtually identical to those from the 2005 survey) and sections of Ch-272. A large survey of San Jerónimo (Ch-146) produced negative results; the property owner believed that the site had been plowed out of existence.

In 2008, we surveyed a badly looted site on the bank of the Santa María (Ch-270) in order to test the hypothesis that Medio period sites often have Viejo period structures beneath the adobe room blocks. By the time this survey was undertaken, there had been quite a bit of rain. Although we obtained some suggestive patterns, we felt that the survey should be redone during the dry season.

Two field seasons of pedestrian survey in the Santa Clara Valley had failed to identify Viejo sites other than Ch-240, so there as well we hoped to use the GPR to detect Viejo period features at Medio period sites. At this point, however, the GPR hard drive ceased functioning, and attempts to fix it failed (but see the account of the 2010 field season).

GPR Results in 2005

The GPR survey area at Ch-254 measured 150 m north-south by 100 m east-west (Figure 44) and was made up of twelve 50 by 25 m sections. Some known parts of the site are outside of the grid, and it is likely that additional structures are present north of the North Arroyo. The GPR detected 34 circular images in the size range of houses (with a diameter of at least 4 m). One of these first appeared on the 25 cm (below surface) scan; 10 appeared at 50 cm; eight appeared at 60 cm; seven appeared at 75 cm; five appeared 1 m. Fourteen smaller features were also identified. Four of these appeared at 50 cm; three at 55 cm; six at 60 cm; and one at 75 cm. The five “structures” noted at a depth of 1 m were not tested (that happened in 2010; they proved to be natural features). If those five anomalies are not counted but the four previously excavated houses are included, at least 29 probable houses (including the larger Structure 1) are present in the part of the site where the GPR scan was done.

The five larger circles visible on the 1 m scan are intriguing. We reasoned that if these were house remains, not natural features, larger houses might be the rule early in the site’s history. As houses became smaller, the larger structures continued as community houses. However, as the 2010 tests showed, the larger circles did not correspond to cultural features.

In order to place all of the excavated structures on a single site plan, the 60 cm GPR scan was overlaid with a portion of the 1999 grid (Figure 45).

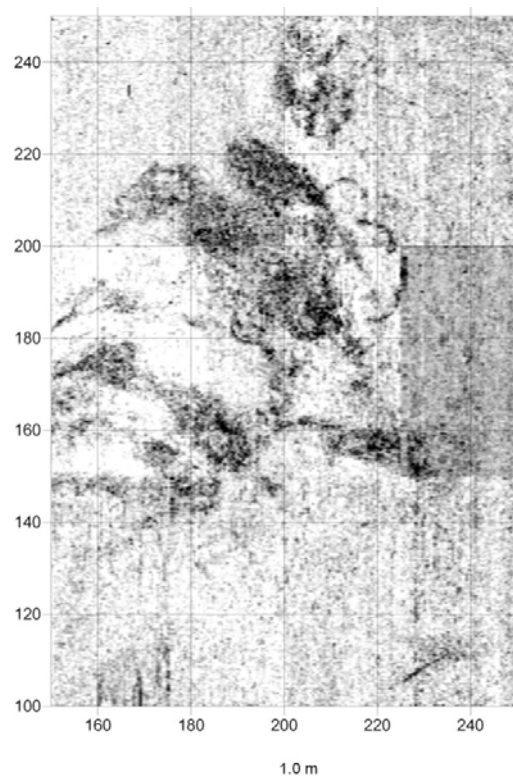
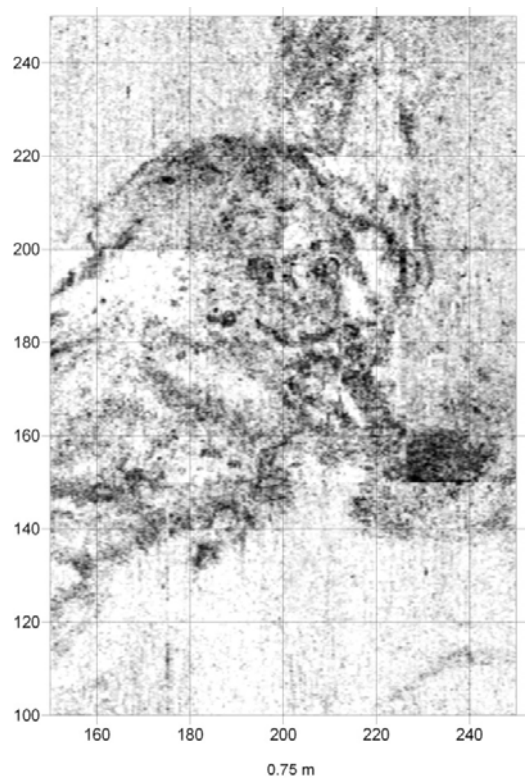
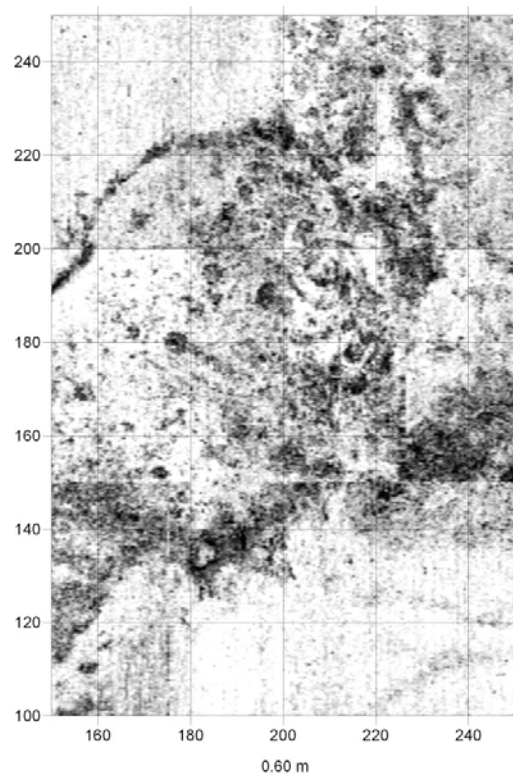
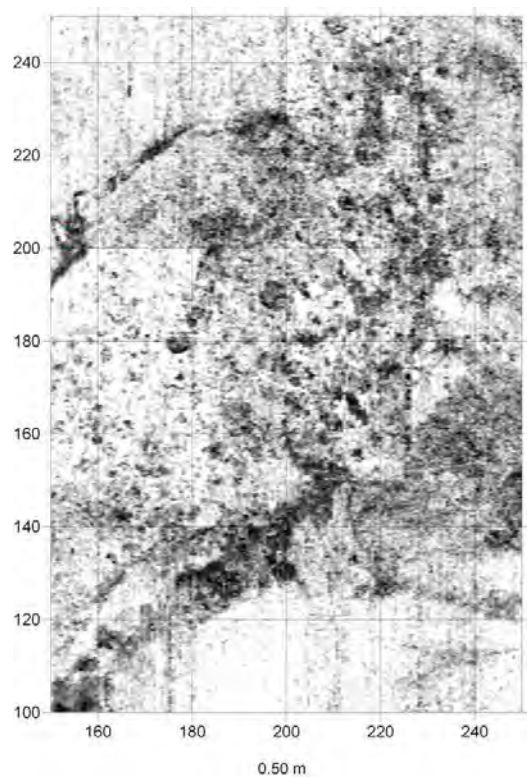


Figure 44. GPR scans of Ch-254. Depths are indicated below the scans. From the 2005 survey.

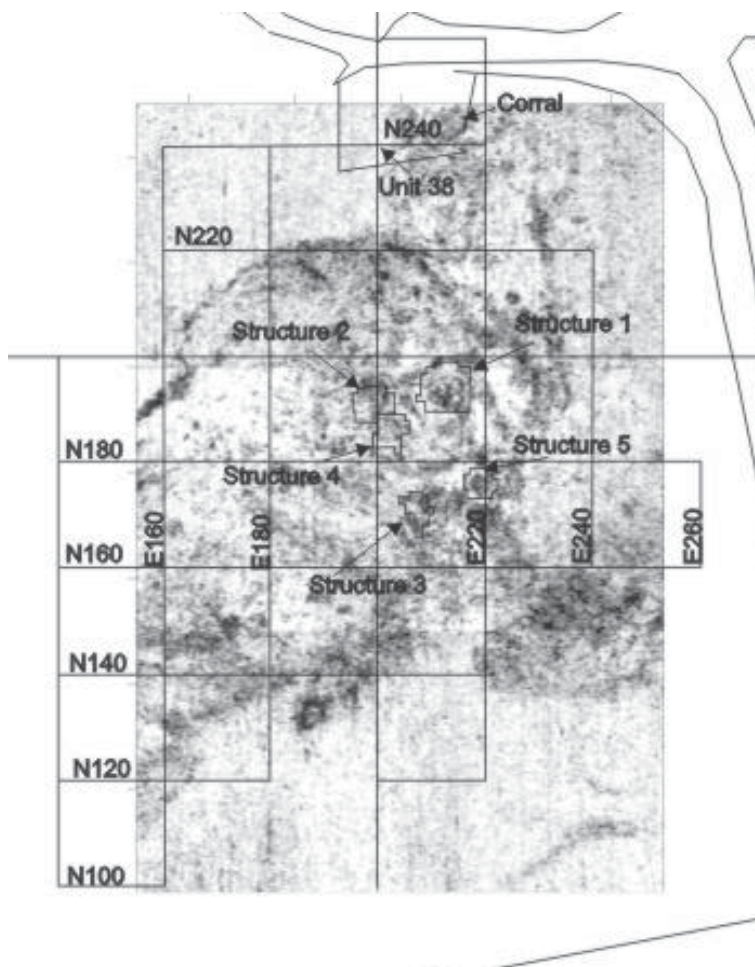


Figure 45. The 70 cm GPR scan of Ch-254, with the 1999 site grid superimposed. The four structures excavated in 1999 are shown as is the Structure 5 area excavated in 2007 and 2008.

Ground Truthing

In 2005, after initial analyses of the GPR scans, six units were excavated in order to “ground truth” anomalies shown on the scans, and to gain experience in distinguishing archaeological from natural features.

Tests 1 through 4 were placed at the western margin of the site, in order to investigate what were thought to be natural rather than cultural features (as proved to be the case). Tests 1 and 2 were in a line; each measured 1.5 by 0.5 m, resulting in a linear excavation measuring 3 by 0.5 m. Tests 3 and 4 were also placed in a line, a short distance to the southeast, and had the same dimensions. All were excavated in a single level, to a sterile gravel that appeared to be part of local outwash fans. Few sherds were recovered, indicating that the area was at the edge of the

site (see below). Only Test 3 produced flaked stone (six flakes, three of them utilized). Test 4 produced no artifacts.

Tests 5 and 6 were placed over the edges of two anomalies that appeared to represent “twin” or back-to-back rounded structures. Test 5, the northern unit, extended over the south edge of what proved to be Structure 5. Test 6, the southern part of the trench, exposed the north wall of Structure 6 (Figure 46).



Figure 46. Tests 5 and 6, looking north. The wall in the middle distance is the north wall of Structure 6. The wall beyond it is the south wall of Structure 5.

Pottery Recorded in 2005

Sherds were most common in the upper levels that represent the plow zone (Table 28). Polychromes were most numerous at the surface; a few occurred in Level 1 (loose plow zone) and none came from the lower levels of the tests. Most of the polychrome sherds are Santa Ana, but the surface collection included Babícora and polychrome sherds too small to assign to a type. Polished black sherds and red-slipped sherds are present in the assemblage, along with red-on-brown sherds including Anchondo and Mata. The “combos” include red rims on plain and corrugated vessels, painting with texturing, and one sherd with a red exterior and a polished black interior. The “others” include sherds with possible paint, too indistinct to categorize. No Mimbres was found. Figure 47 provides a visual sample of the sherds found in 2005.

Table 28. Sherds Collected in 2005.

Lot	Prov.	Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Combo	Other	Total
1500	General	Surface	22	15	9	19	24	24	6		119
1514	Test 1	1	5		1		3	1			10
1515	Test 2	1	3								3
1516	Test 5	1	92	4	5	6	9	4	7	1	128
1517	Test 3	1	10		1	2	2				15
1518	Test 5	2	6	1						1	8
1519	Test 5	3 (north)	15	1	2	2	3		1		24
1521	Test 5	3 (middle)	5	4		2	2		4		17
1522	Test 6	1	38	3		5	8	2			56
1523	Test 6	2	26	3	2	2	3	1	2		39
1526	Test 5	3	5	1	1		2		1		10
1530	Test 7	1	62	27	3		12		1		105
Totals			289	59	24	38	68	32	22	2	534



Figure 47. Some sherds from 2005. Upper left: Test 5, Level 1 (Lot 1516). Upper right: Test 5, Level 3 (Lot 1521). Lower left: surface (Lot 1500). Lower right: Test 6, Level 1 (Lot 1522).

Other Artifacts

The surface collections yielded four shaped pieces of flaked stone: a chert biface, a small side-notched point of heat-treated chert, a quartzite graver, and a worked obsidian flake (Figure 48).



Figure 48. Four flaked stone artifacts recovered from the surface in 2005. Lot 1500. The piece on the left is 3.4 cm long. Lot 1500.

Flaked stone debitage was recovered from each of the test units, with the largest number (10) coming from Test 6, Level 2. Of the 22 pieces, only three were utilized. No cores were found.

The surface collection included four grooved axe heads or fragments (Nos. 1500-5, 1500-6, 1500-9, and 1500-14). In addition, Alicia Calderón donated an axe head that she had found on the surface some years earlier (No. 1500-8). The two complete axe heads are three-quarter grooved (Figure 49).



Figure 49. Axe heads and fragments collected in 2005. Left; axe fragments Nos. 1500-6 (top) and 1500-5 (bottom). Right: axe heads Nos. 1500-9 (top) and 1500-8 (bottom).

A fragment of a stone bowl was recovered from Test 5, Level 1 (No. 1500-13; Figure 50). From Test 5, Level 3 came a ground fragment of vesicular basalt 6.1 cm long and 3 cm wide (No. 1526-1).



Figure 50. Stone bowl fragment recovered in 2005. Left: exterior. Right: interior. No. 1516-1.

A bilobe bead (the first encountered by the PAC, and like the ones associated with the infant burial excavated in 2008), a triangular shell piece and a disk bead were recovered from the surface (Figure 51).



Figure 51. Shell recovered in 2005. Left: bivalve shell from Test 5, Level 3 (Lot 1521). Right: bilobe bead (No. 1500-3), triangular piece (No. 1500-11), and disk bead (No. 1500-12); all three were surface finds.

An unworked half of bivalve shell came from Test 5, Level 3 (Figure 51). Similar bivalve shells were identified as *Anadonta californiensis* by Arthur Vokes in 1999. Small fragments of local mollusk shell were encountered in six of the 2005 excavation levels.

Discussion

The most important aspect of the 2005 work at the Calderón site was the start of GPR work in the southern zone of the Chihuahua culture area. Ground truthing of the GPR imagery confirmed that two anomalies were indeed round structures. Assuming that the other anomalies about 4 m in diameter also represent rounded structures, we thought at the time that the site contained at least 29 habitation structures. As excavation continued in 2008 and 2010, however, the estimate of the number of structures changed. Images at the 1 m depth were shown to be natural, Structure 5 turned out to represent not one but three or four superimposed structures, and deep plowing pulled up evidence of structures well beyond the GPR grid.

Chapter 11

INTRODUCTION TO STRUCTURE 5 AND ITS ENVIRONS

In 2007, two parallel east-west trenches (North Trench E and W; South Trench E and W) were opened to relocate the “twin” structures (Structures 5 and 6) tested as part of ground truthing for the GPR survey in 2005. In addition, 2005 Test 6 was cleaned out. The surfaces in the north profile of the newly exposed Test 6 suggested that three superimposed floors existed in the north structure, and that the GPR survey had detected only the lowest of these. The northern of the two adjacent structures (Structure 5) was selected for excavation because of the superimposed floors seen in profile, and because the structure was the smaller of the two. Figure 52. Shows the location of Structure 5. Figure 53 shows GPR imagery of the Structures 5 area.



Figure 52. Location of Structure 5 within Ch-254. Source of image: Google Earth.

Once we identified the southern wall of Structure 5 and associated upper floor remnants, we extended the excavation to the (true) north to expose an oval wall with an interior room dimension of 5.5 by 5 m. In the plow zone (Level 1), 15 to 25 cm below surface, a compact light brown stratum of “adobe melt” capped fragments of a plaster floor with numerous artifacts (Level 2).

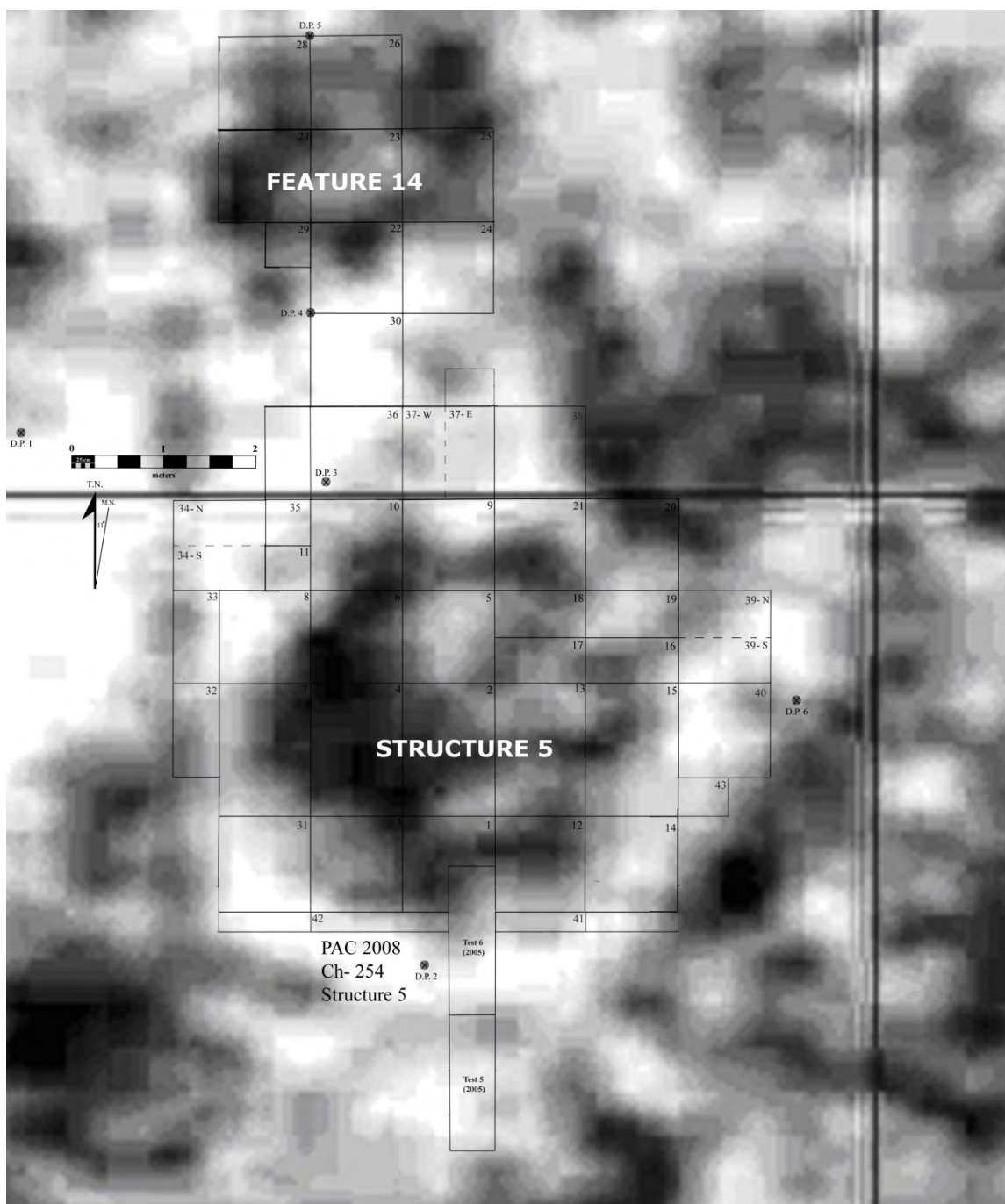


Figure 53. The 2008 excavation grid. Superimposed on the 2005 GPR scan (at 60 cm below surface). The 2007 Tests 1–4 are not shown.

The floor had visible plow scars; other disturbance had also occurred because the floor had been so close to the surface. Nonetheless, it became clear that major portions of pottery vessels and several heavy stone artifacts were either in situ or very close to their original position.

In the time remaining during the 2007 field season, the top floor (Floor 5A) was excavated (Figures 54–56). The resulting floor assemblage is one of the most complete recovered by the PAC, yielding important information about Viejo period household furnishings. This was unexpected, given that floor was so shallow and in a plowed field.



Figure 54. Structure 5A during excavation. Left: view to north along the cleaned-out 2005 Test 5/6. Photo by Loy Neff. Right: aerial photography. Photo by Rafael Cruz Antillón.



Figure 55. Excavation of the Structure 5 area in 2008. Looking SE. Feature 14, an external hearth, is to the left of Structure 5.



Figure 56. Francisco Patiño collecting floor samples for chemical analysis.

In 2008 we further investigated Structure 5 and continued testing the GPR's effectiveness in identifying subsurface structures and features. The 2005 GPR survey did not identify floor 5A, so in 2008 we tried to correlate the scan profile view for Structure 5 to the actual construction phases. In 2008 the land owner, Sr. Calderón, was planning to plant beans in this field, so we were mostly limited to an area of roughly 6 by 6 meters opened in 2007. We were able to open an extension to the north, in order to explore a small anomaly on the 2005 GPR scan (as it turned out, a stratified and sealed hearth).

At the end of the excavation, we placed aluminum pop cans marked "PAC 2008" in several of the open pits and along the edges of the walls, and a metallic 4-way lug wrench¹ at the bottom of unit 2-S (Level 9). Deep test pits and other features were backfilled manually. Finally, the bottom of the excavations (mostly at Floor C) was covered with a large black plastic sheet, held in place by stones and a plywood board. The open pit was then backfilled with the help of a tractor provided by Sr. Calderón.

Floor plaster samples of about 100 grams each were collected at 50 cm intervals, for future chemical analysis (Figure 56).

A baulk left in the northeast corner of the structure, was removed once we reached sterile soil in the units to the south and west (see Figure 57 for the baulk's location and Figures 58 and 59 for profiles). Although the baulk nominally consisted of several units (18–20 and 21), it was excavated as a single horizontal unit; vertically, we followed the layers visible in the two profiles.

¹ This was suggested by Jean-Michel Maillol, to facilitate relocation of the structure with a GPR.

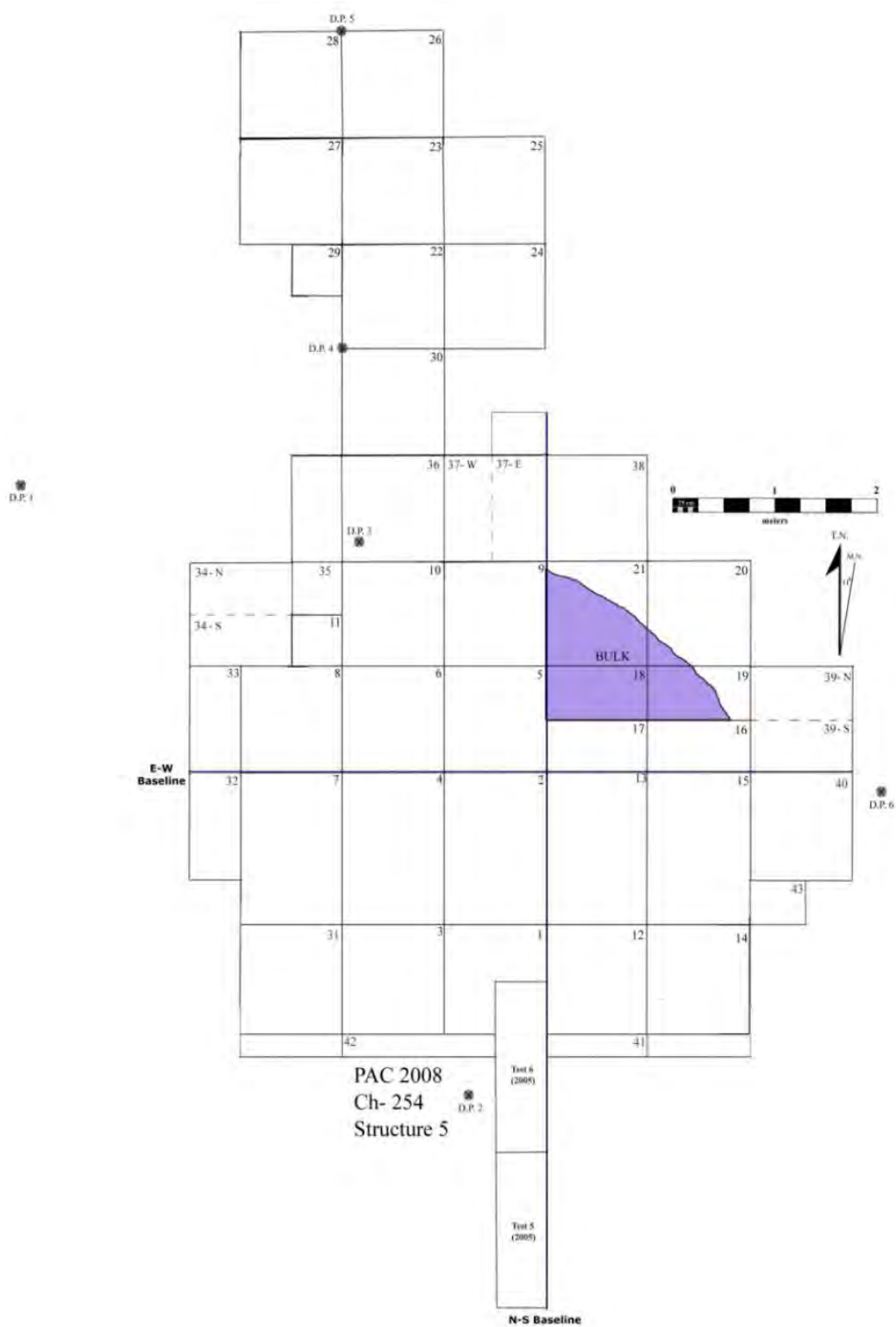


Figure 57. The 2008 excavation grid, showing the baulk left in place for most of the 2008 season. The baulk is shown in purple.

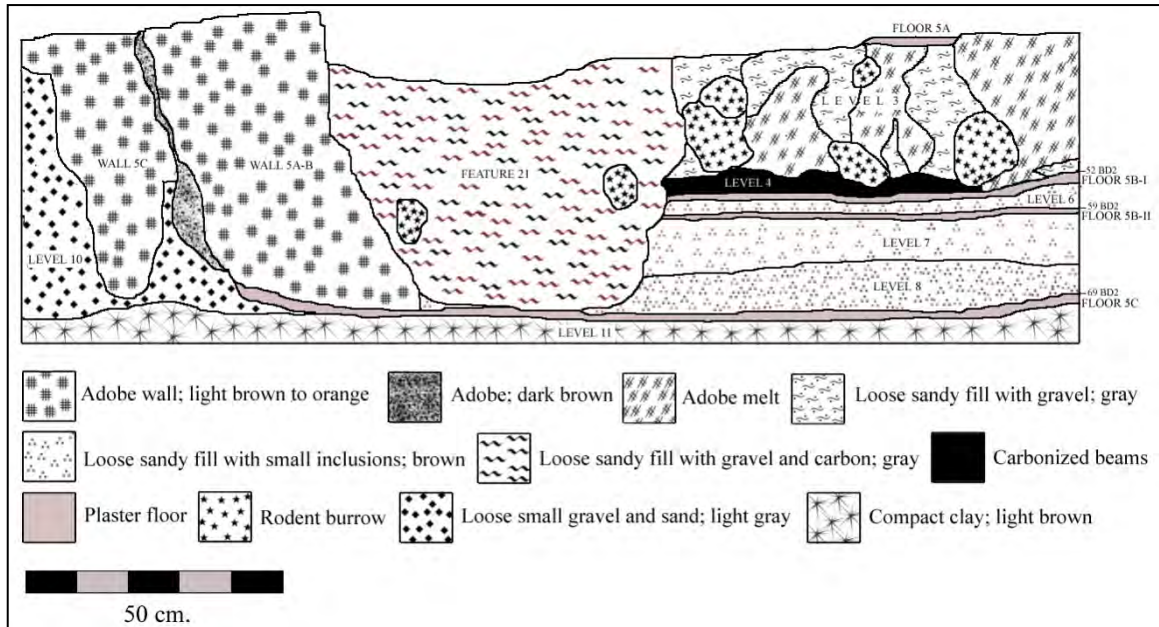


Figure 58. Structure 5 excavation area: west profile of the baulk.

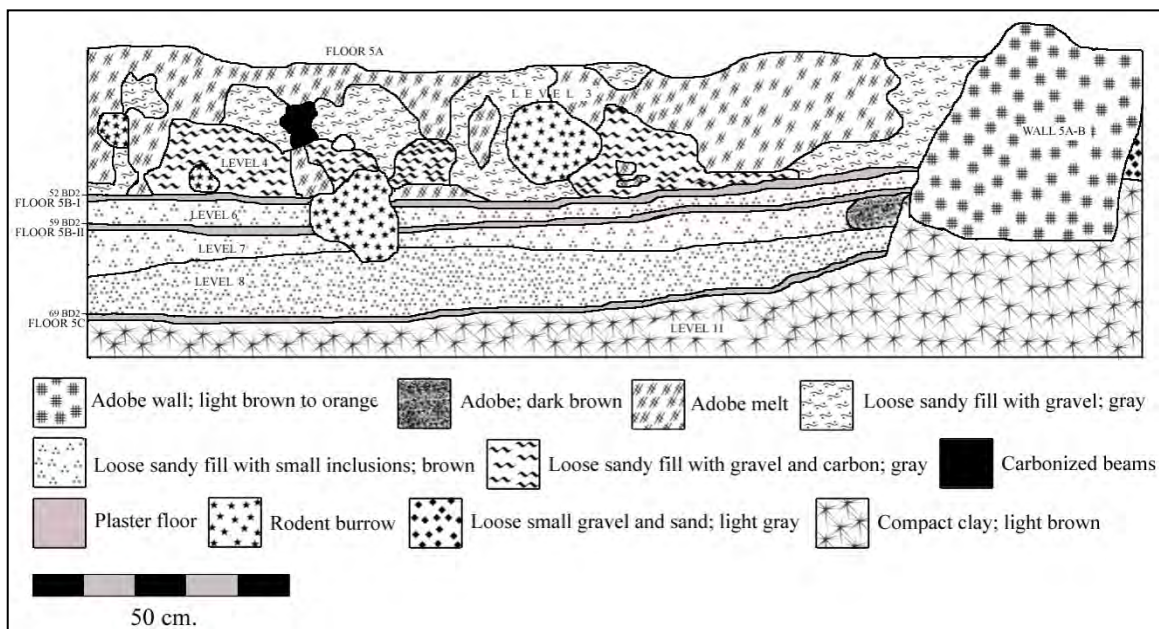


Figure 59. Structure 5 excavation area: south profile of the baulk

In order to record the full stratigraphic sequence, we opened two 25 cm wide trenches along the west and south face of the baulk, below floor 5C and into the sterile Level 11 (at 80 cm BD2). Three additional tests were opened in Units 34/35-N, 37-E, and 39-N, to explore the stratigraphy outside the structure.

Table 29 lists the 2008 features, and Table 30 summarizes the pottery from the 2008 excavations. Specimens for the 2008 botanical analysis, conducted by Natalia Martinez Tagüña, came from eight features in seven units of the Structure 5 excavations, below the level of Floor 1. The shallow deposits above Floor 1 were so disturbed by plow actions that few botanical specimens were recovered in 2007. A few macrobotanical specimens came from the 2008 excavations, but most of the processed samples were collected through flotation. These samples contrast with previously analyzed ones in being dominated by woods, thus emphasizing the nature of these deposits as resulting primarily from the repeated leveling and rebuilding of the three superimposed structures. However, *Zea mays* was present in quantity, as were lesser numbers of grass (*Gramineae*), one cheno-am seed, and probable legume seeds.

Notes on Stratigraphy

Level 11, the lowest natural level observed in the excavation area, consisted of light brown clay; it was, during the 2008 field season, very compact and damp. This seems to be the same matrix we encountered in the 2005 tests placed in the west half of the site to ground-truth anomalies (2005 Tests 1, 2, 3 and 4). The clay was found 50 cm BD2 in Unit 37-E (north of Structure 5), 70 cm BD2 in Unit 34-N (east of the structure), 73 cm BD2 under Floor 5C, and 124 cm BD2 in Unit 2-S (see Level 9).

Level 10, superimposed on the clay layer, was a light-gray to white fine gravel, quite similar to sediments found along the local arroyo banks, although much more compact. At first we suspected that Level 10 was a cultural deposit, intended to level the area or to prevent mud, but the lack of artifacts and the thickness of the layer suggests that this was a natural deposit. In the northern extension of the Structure 5 excavations, the Level 10 fine gravel shows up consistently 40 cm BD2 (in Units 37-E, 34-N, and 23), suggesting that while the deposit was natural, it was leveled over a large area.

Within Structure 5, Level 10 dropped sharply in Unit 2-S, appearing 86 cm BD2 (see Level 9). It therefore further appears that the fine gravel was removed to create the pit for construction of Structure 5C. Level 10 was identical in texture and color to the so-called “volcanic gravel” identified in the 2005 Test 6, in the space between the walls of Structure 5 and its southern “twin,” Structure 6. At the moment it is not clear whether the 2006 Test 6 “volcanic gravel” was in situ sterile sediment, as was the case at the north end of the excavations, or was used to fill the space between the two pit houses.

Table 29. Features excavated in 2008.

No.	Unit (Level)	Floor	Description
1	2, 5 (Level 4)		Hearth; concentration of fire-cracked rock and ash
2	5 (Level 5)		Concentration of 4 pieces of flat fire-cracked rock
3	13, 15 (Level 3)		Mauls and ground stone in gray ashy clay
4	2	Through 5B- I	Ceramic vessel over ground stone in a pit
5	10 (Level 4)		Burned posts
6	3-E (Level 4)		Burned posts
7	3-W (Level 4)		Burned posts
8	4, 7 (Level 4)		Burned posts
9	7, 8 (Level 4)		Burned posts
10	16, 17 (Level 4)		Possible trash pit
11	9, 10 (Level 5)	5B-I	Concentration of fire-cracked rock
12	14, 15 (Level 4)		Possible trash pit
13	17 (Level 4)		Bundle of charred grass
14	22, 23, 26–29 (Levels A–D)		Extramural superimposed cooking pits
15	26 (Level 2)		Concentration of fire-cracked rock
16	3-center	Through 5B-I	Pit
17	5, 6-center E	Through 5B-I	Pit
18	9-SW	Through 5B-I	Pit
19	3-N	Through 5B-I	Pit with maul
20	8-E	Through 5B-I	Pit
21	9, 21 (Level 3)	5A	Large trash pit (see Feature 73)
22	6-center	Through 5B-I	Pit
23	2-NW	Through 5B-I	Pit
24	2-E	Through 5B-I	Pit
25	15-N, 16-S	Through 5B-I	Pit
26	1-NE	Through 5B-I	Pit
27	5-center	Through 5B-I	Pit
28	5-NW	Through 5B-I	Pit
29	6-W	Through 5B-I	Pit
30	2-S	Through 5B-I	Pit with mano and broken maul
31	4-SW, 7	Through 5B-I	Pit
32	2-SE	Through 5B-I	Pit with stones; possibly associated with Floor 5B-II
33	13, 15	On 5B-I	3 stone balls and pebbles
34	6, 10	Through 5B-I	Plaster patching of floor 5B-I/Burial 2
35	13, 17	On 5B-I	Hearth
36	7, 8	Abutting 5B-I	Raised adobe “step” along western wall
37	1	On 5B-I	<i>Metate</i> fragment; overturned
38	6-SE	Through 5B-I	Pit
39	8-W	Through 5B-I	Pit

Table 29. Features excavated in 2008.

No.	Unit (Level)	Floor	Description
40	2-center S	Through 5B-II	Pit
41	7-NE	Through 5B-II	Pit
42	3-center W	Through 5B-II	Pit
43	3, 4-E	Through 5B-II	Pit
44	4-SE	Through 5B-II	Pit
45	2-NE	Through 5B-II	Pit
46	1-N, 2-S	Through 5B-II	Pit
47	2-SW	Through 5B-II	Pit
48	2-SE, 1-NE	Through 5B-II	Pit with ash, charcoal, and fire-cracked rock; possible hearth
49	7-center W	Through Feature 54-b	Pit
50	7-W	Through Feature 54-b	Pit
51	7-NW	Through Feature 54-b	Pit
52	13-SE	Through 5B-II	Pit
53	15-SW	Through 5B-II	Pit
54-a	12, 15	Abutting 5B-II	Interior adobe step added to SE adobe wall
54-b	7, 8	Abutting 5B-II	Interior adobe step added to W adobe wall
55	5, 13, 17	5B-II	Hearth
56	1, 3, 4, 7, 8, 12, 13, 15, 16, 35, 37	5C	Circular adobe wall; originally was given a feature number. At the bottom of pit Feature 25.
57	1, 2 (Level 9)		Hearth; charcoal, sherds, fire-cracked rock, burned adobe
58	5, 9	5C-I	Plastered hearth
59	13, 17-W	Through 5C-I	Pit
60	2-center S	Through 5C-I	Pit (bottom of Feature 40)
61	2-center N	Through 5C-I	Pit
62	5-SW	Through 5C-I	Pit
63	9-SW	Through 5C-I	Pit (bottom of Feature 18)
64	4, 6-W	Through 5C-I	Pit
65	8, 6- N	Through 5C-I	Pit (bottom of Feature 20)
66	5-E	Through 5C-I	Pit
67	5-W	Through 5C-I	Pit
68	2-SW	Through 5C-I	Pit
69	13-S	Through 5C-I	Pit (bottom of Feature 52)
70	17	5C-II	Hearth; plastered over by 5C-I

Table 29. Features excavated in 2008.

No.	Unit (Level)	Floor	Description
71	2	Through 5C-I	Patched pit
72	6-NE	Through 5C-I	Patched pit
73	21 (Level 3)	Or Floor 5A	Number canceled; same as Feature 21
74	18–21 (Level 4)		Burned posts
75	12, 15 (Level 9?)	Wall 5C	Ash and carbon lenses
76	1, 12 (Test 6- 2005)	5C	Extramural mano on compact clay surface
77	19	Through 5B-I	Pit
78	3, 7, 8, 31 (Level 5)	5A	Western buttress to wall 5A
79	15, 16 (Level 5)	5A	Eastern buttress to wall 5A

Table 30. The Pottery from the Structure 5 Area Excavations, 2008.

Level	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Combo	Mimbres Black-on-white	Other	Total
1, above floor 5A	63	13		3	6	1	1			87
2, ca. Floor 5A	40	12		4	2	1				59
3, above Floor B1	485	152	17	37	71	7	10		4	783
Between Floors 5A and 5B1	134	57	3	10	28	1	6		3	242
Associated with Floor 5B1	131	23	3	3	9					169
Above floor 5BII	39	8	1	5	4	1				58
Associated with Floor 5BII	36	9		5	3					53
5, Floor 5B2	70	25	2	11	6	3	1		1	119
Above floor 5C	92	41	1	13	5		2		1	155
Associated with Floor C	16	5		2	1					24
Floor 5C	171	49	5	12	7				1	245
8, below Floor 5C	36	7								43
9, hearth and fill	7	1			1		85			94
Outside E wall, Floor C	100	36	1	9	5	0	1			152
Cleaning and rodent holes	115	57	2	20	13	2	4		4	217
Total, Structure 5	1420	438	33	114	143	14	106		10	2283
Surface collections	1			2	2	7	2	4		18
Northern Extension, Level 1	822	252	64	87	144	67	11	2	4	1453
Northern Extension, Level 2	39	17		4	3		1			64
Northern Extension, Level 3	39	16	1		4	2	5			67
Feature 14 Hearth	28	8		1	1		2			40
Total, 2008	2464	788	100	228	310	92	131	6	18	4142
Total, 2009										8385
Total, Both Years										12777

The natural strata observed in the Structure 5 excavation area are quite different from the ones observed in the north face of the North Arroyo (a short arroyo, north of the main site area, actively cutting westward from arroyo El Pino) (Figure 60). In the latter area, the deposits below the cultural deposits (including a possible floor and a pit) consist of several strata of water-deposited pebbles of different sizes and densities. These pebble deposits start about 1 meter below the modern surface and extend to 3 meters below that surface, to the arroyo floor. Neither Level 11 nor Level 10 occurs in the arroyo profile. The site is on a low terrace within an oxbow of arroyo El Pino, and the deposits in the North Arroyo are undoubtedly related to the meandering of this section of El Pino.



Figure 60. Natural strata at Structure 5 area and in the North Arroyo. Left: at Structure 5. Right: in the North Arroyo. Note the overlying cultural deposits visible in both photographs.

Chapter 12

STRUCTURE 5C

In the next few chapters, information is organized in the same order as the construction sequence. In other words, we begin with the earliest (and lowest) version of Structure 5 (Figures 61–63) and conclude with the latest (and highest) one. The area had been used previously, but the earlier cultural deposits had been covered by sediment. The first step in building the structure was to create a level surface, including by digging into natural Levels 10 and 11 in the north half of the structure.

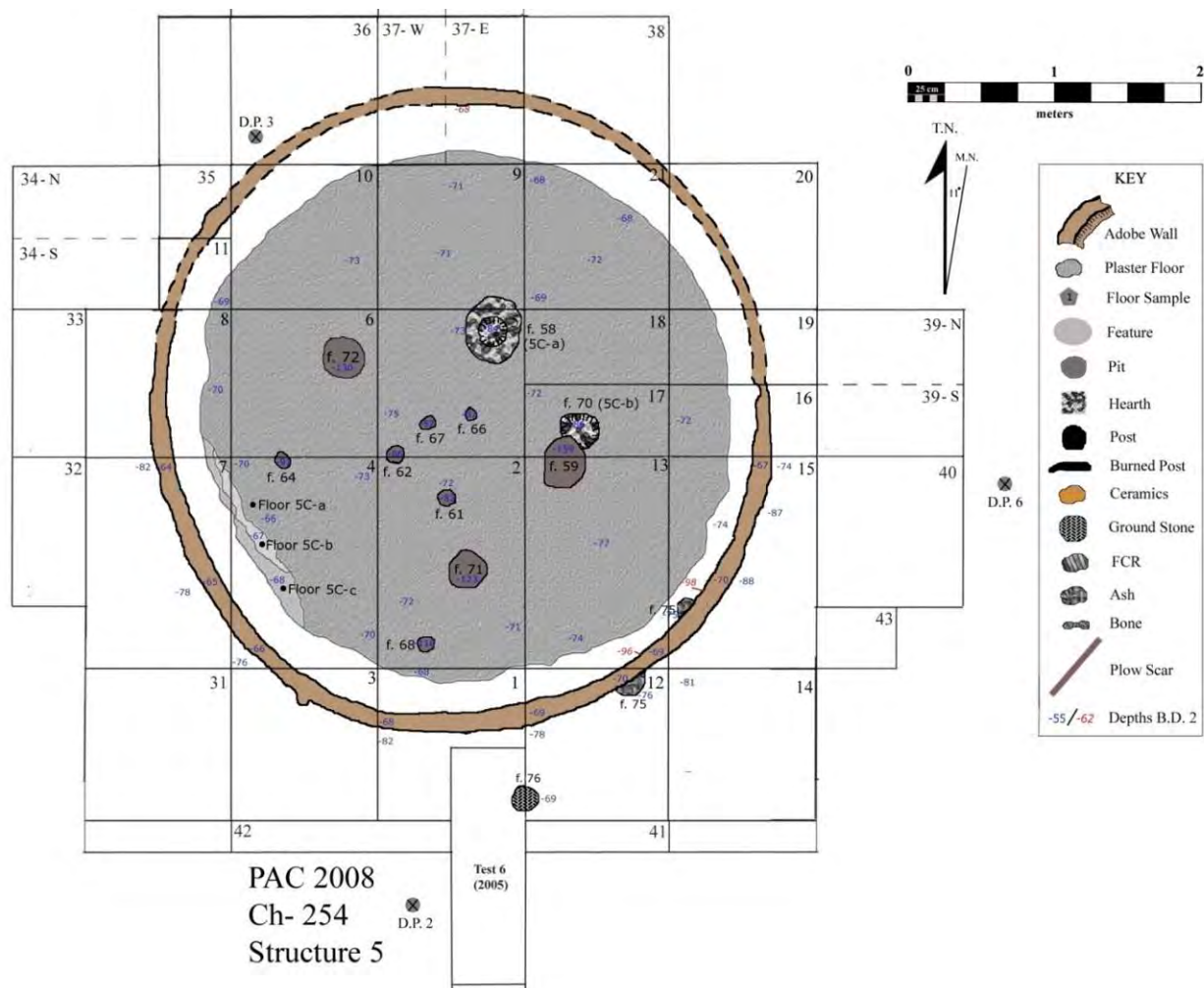


Figure 61. Plan of Structure 5C and its associated features.

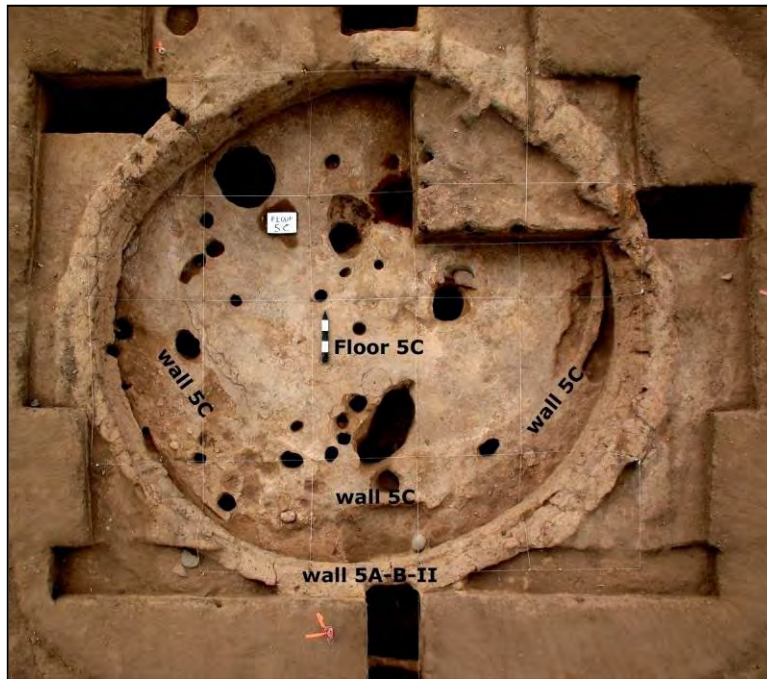


Figure 62. Structure 5C, before removal of the baulk. This is the same baulk shown in Figure 57.

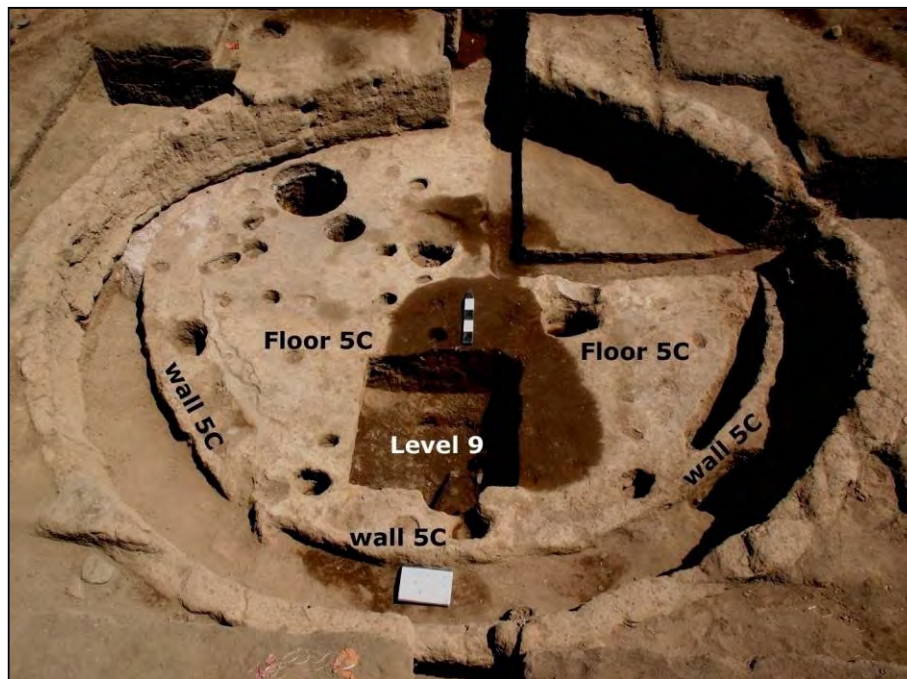


Figure 63. Oblique view of Structure 5C, after the removal of the baulk. Looking north; taken just before Structure 5 was backfilled. The dark area is rainwater.

Architectural Details

An elliptical adobe wall base¹ measuring 4 meters east-west and 4.3 meters north-south was built by shaping a single layer of adobe, 10 to 15 cm wide, to define the structure perimeter. In the northern portion of the structure, where the floor was leveled by excavating, the wall base was built against the resulting pit wall. Here, the mud-clay plastic mix was placed in a shallow trench dug into sterile Level 10, with a lower depth of 68 cm BD2. In the southern portion of the structure, the wall base sat in cultural fill (Level 9), with a lower depth of 96 cm BD2. If there was a footing trench for the southern portion of the wall, it was not observable in the cultural fill.

Part of the Structure 5C wall base lay inside the later structures (5B and 5A) and was mostly destroyed by subsequent construction. Here, the top of the wall base was found 64 to 69 cm BD2. Outside the later structures (the north end of Structure 5C), much more of the 5C wall survived, extending upward to 10 cm BD2.

A plaster floor was laid within the wall base. The resulting floor measured 3.6 m east-west and 3.7 m north-south. The floor did not reach the adobe wall, so that a margin of 20 to 25 cm was left between the wall base and the floor edge. In the north part of the structure, the floor sat directly on sterile Levels 10 and 11; the southern part of the floor lay on top of the Level 9.

We identified three episodes of floor plastering,² labeled 5C-c (earliest; 68 cm BD2), 5C-b (intermediate; 67 cm BD2), and 5C-a (latest; 66 cm BD2; all three depths taken in the floor's southwest quadrant) (Figure 64). Floor 5C-a reached maximum depth of 75 cm BD2, at the center of the structure. Only this uppermost floor was fully exposed.



Figure 64. Floor 5C, showing the three layers of plaster.

¹ This wall was first identified in the bottom of pit Feature 25 (see structure 5B-I), as Feature 56.

² In the field we used 5C-I to 5C-III to designate these phases. Lower-case letters are used here, to better differentiate re-plastering phases from floors.

The combined floors were 3 cm. thick; a few centimeters of sub-floor material were observed in the south half of the structure. Floor 5C was found at more or less the same depth as the so-called “Floor A” in the adjacent Structure 6, as partly exposed in the 2005 Test 5, so might be contemporaneous with that feature.

We collected 34 plaster samples from the floor, except in the northeast quadrant where the baulk was still in place (Figure 65). We hope to export the samples in the future, in order to define chemical signatures for activity areas within features.

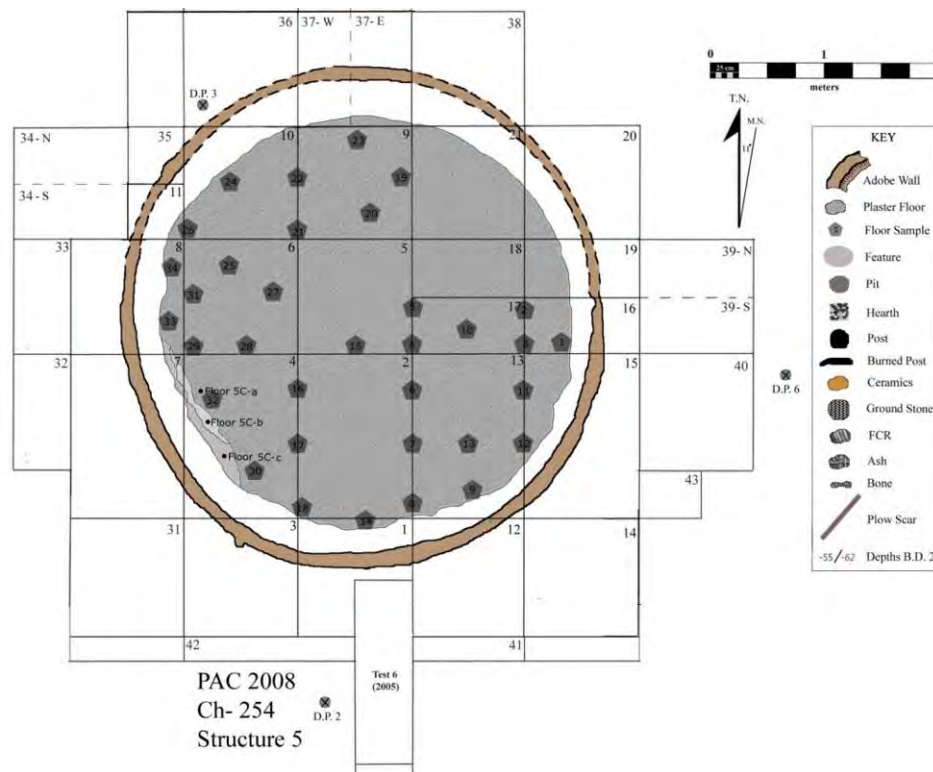


Figure 65. Plaster sampling locations for Floor 5C.

The surface between the plaster floor and the adobe wall consisted of soft clay-like material, quite distinct from the plaster floor. This gap may indicate a long-gone *bajareque* wall or wood frame.

A clay surface, similar to that found between the plastered floor and wall base, was visible south of the wall base, and included loose clumps of clay. This surface was mistakenly identified as “Floor B” in 2005 Test 6, but more complete excavation made it clear that the mano resting on that “surface” (left in situ until 2008) pertained to an external surface, not on a floor (see Feature 76, below, and Figure 54 [of the re-excavated Test 6]).

Some pit features were intruded during construction of Structures 5B-I and 5B-II. They include Features 60, 63, 65, and 69 (the downward extensions of Features 40, 18, 20 and 52, respectively), associated with Floor 5BII. We are left with nine pits (Features 59, 61, 62, 64, 66–68, 71, and 72), mostly restricted to the south half of the structure, albeit others might have been plastered over by floor 5C-a. All nine pits had rounded bottoms. All were filled with a dark brown sandy soil, with few or no inclusions. Any of these pits could have been post holes. The largest two pits, Features 59 and 72, were centrally located and might have held primary support posts. If so, we must explain why Feature 72 (and also Feature 71) was covered by the plaster during the preparation of Floor 5C-a.

Structure 5C included two bowl-shaped hearths, Features 58 and 70 (Figure 66). The earlier hearth, Feature 70, in the east half of the house, was molded into the plaster of Floor 5C-b. The hearth measured 30 cm in diameter and 6 cm deep, with the bottom at 86 cm BD2. The hearth's fill contained loose, dark gray ash, with charcoal, and the plaster around the rim was discolored by heat. This hearth was later plastered over by floor 5C-a; during later construction, Feature 59 was dug through the hearth, partly destroying it.



Figure 66. Structure 5C, hearths. Left: Feature 7, associated with Floor 5C-b. Plastered over by Floor 5C-a and cut by Feature 59. Right: Feature 58, associated with Floor 5C-a.

The second hearth, Feature 58, in the northeast sector of the structure, was molded into the plaster of Floor 5C-a, cutting through the earlier floors. The hearth measured 20 cm in diameter and 10 cm deep, with the bottom at 84 cm BD2. This hearth contained burned adobe fragments and ash mixed with soil; the plaster around the perimeter was discolored from the heat, as was the clay of Level 11 beneath the hearth.

Discussion

The following comments should be useful as the discussion turns to the subsequent versions of Structure 5. Figures 67 (below), 68 (next page), and 69 (Page 106) show the relationships of Structure 5C to later remains and the local stratigraphy.

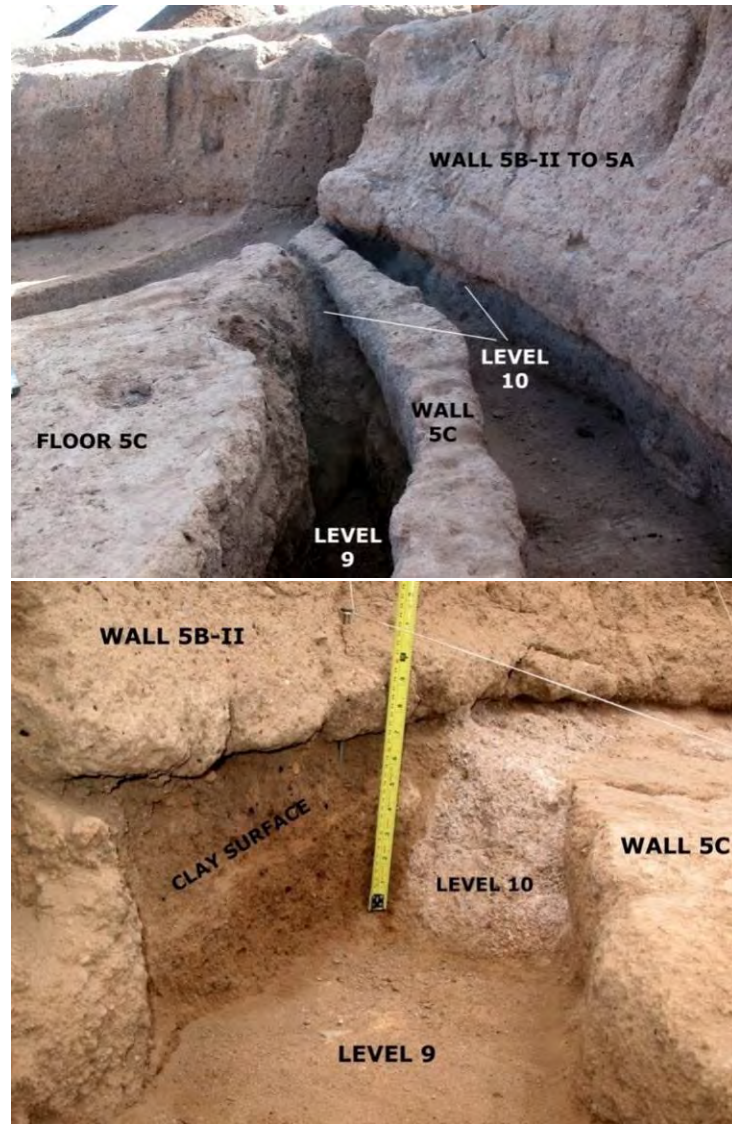


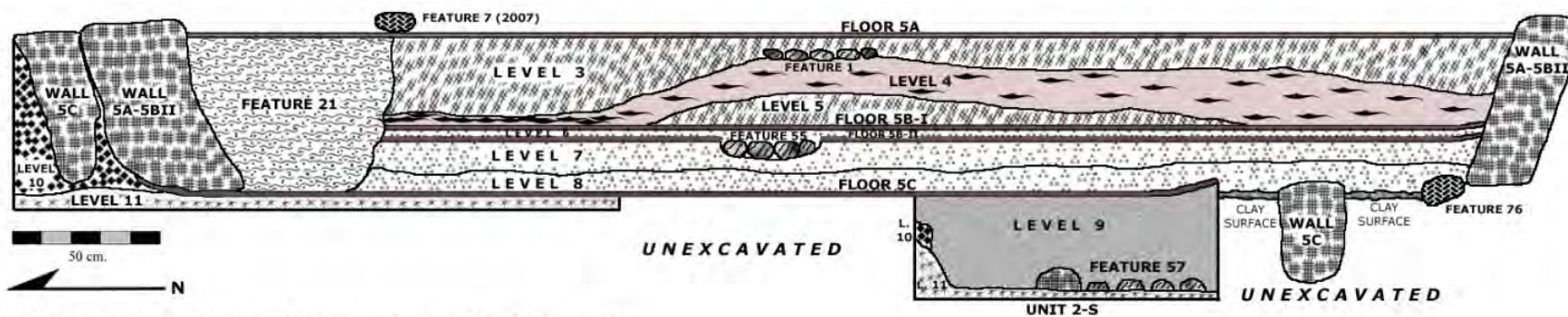
Figure 67. Some details of Structure 5C and its context.



Figure 68. Superimposed adobe wall courses of Structure 5.

The three distinct structures that made up Structure 5 all had low adobe wall bases. The wall base of Structure 5C, the oldest structure, was built in part over cultural fill (on the structure's south side), and in part into undisturbed deposits (on the north side), resulting in the wall base being placed into a trench on the south side, while the north side was supported by the natural gravels. The half of the Structure 5C wall was removed almost to Floor 5C when Structure 5B was built. Structures 5B and 5A mostly shared wall bases, albeit Structure 5B burned and was leveled prior to construction of Structure 5A.

Five distinct adobe courses were visible on the interior face of the wall for Structures 5A to 5BII (Figure 69). These courses presumably were associated with the different floors of the upper structures.



A schematic cross-section of strcuture 5 along the N-S base line

Figure 69. Profile of Structure 5, showing relationships among walls and floors. Left is to the north, right to the south.

Structure 5BII

PAC 2008
Ch- 254
Structure 5

Test 6
(2005)

D.P. 2

0 1 2
meters

T.N.
M.N.
11°

KEY

- Adobe Wall
- Plaster Floor
- Floor Sample
- Feature
- Pit
- Hearth
- Post
- Burned Post
- Ceramics
- Ground Stone
- FCR
- Ash
- Bone
- Plow Scar
- Depths B.D. 2

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Architectural Details

The wall width ranged from 35 cm in the north to 25 cm in the south. The wall included at least two courses of adobe; it curved in moderately towards the bottom. Several small post-like impressions were observed in the interior face of the wall, perhaps indicating supports for an upper wall of *bajareque*. If so, Structure 5BII must have resembled Structure 2 at Ch-254.

The builders of Wall 5BII left the north end of Wall 5C intact, and seem to have used the latter to help support the former. In doing so, they left leaving only a small amount of sterile Level 10 at the bottom of Wall 5BII. To the northeast and northwest, Wall 5C was instead incorporated directly into Wall 5B-II. This was seen most clearly in the east profile of Test 35, where Wall 5C was still visible under Wall 5B-II. On the south side of Structure 5C, the foundations of Wall 5C were identified only below the new floor level; that portion of Wall 5C had been leveled to accommodate Structure 5B.

Once the new wall was in place, two layers of fill were introduced to prepare the floor. The first layer (Level 8) consisted of 10 cm of dark brown, sandy material, with small inclusions and clay clumps. This was placed directly on floor 5C and the clay deposit immediately to the south. A second layer of fill (Level 7), 7 cm thick, was then added; this material was looser and lacked inclusions, but otherwise was similar to Level 8. A possible compacted surface at the top of Level 8 was defined in the profile of Feature 27, a pit, but did not extend beyond Unit 5. The surface of Level 8 served as the base for Floor 5B-II. Otherwise, there was no indication of a floor between the two levels, and the transition between them was quite difficult to define.

A plaster floor was placed on top of Level 7 and, as happened with Floor 5C, was plastered three times (from top to bottom, 5B-IIa, -IIb, and -II-c) (Figure 71). We fully exposed only the uppermost floor, 5B-IIa. The combined plaster floors were 3 cm thick, overlying 2 cm of floor preparation fill. The plaster curved upward to abut the wall. The floor was 52 to 55 cm BD2 in the northern part of the structure, 55 to 60 cm BD2 to the east, 52 to 57 cm BD2 to the south, 56 to 57 to the west, and 55 to 58 cm BD2 toward the center of the structure. We collected 19 plaster floor samples (not separated by plastering episodes) from Floor 5C; at the time, most of the floor was wet, due to rain, so the samples come only from the drier northwest quadrant of the room (Figure 72).

Feature 54b was a small adobe “step” just inside the wall, in the western part of the structure (Figure 73). The “step” measured 1.5 meters long and 10 cm wide, and rose 3 to 5 cm above the adjacent floor. A similar raised “step” may have been present along the southeast portion of the wall (Feature 54a), but the feature in question was poorly preserved. These “steps” were added to the adobe wall before Floor 5B-II was laid, since the Floor 5B-II plaster did not extend under the steps (see also the discussion of Structure 5B-II). Structure 4 at Ch-254 included a similar architectural feature.

Fourteen pit features, semicircular in profile, were identified in Floor 5B-II, all in the southern portion of the structure (Features 40–53). Most were no more than 15 cm in diameter. All of the pits were filled with dark brown sandy soil with few or no inclusions, and could have been post holes.



Figure 71. Floor 5B, showing layers 5BII-a (top) to 5BII-c (bottom).

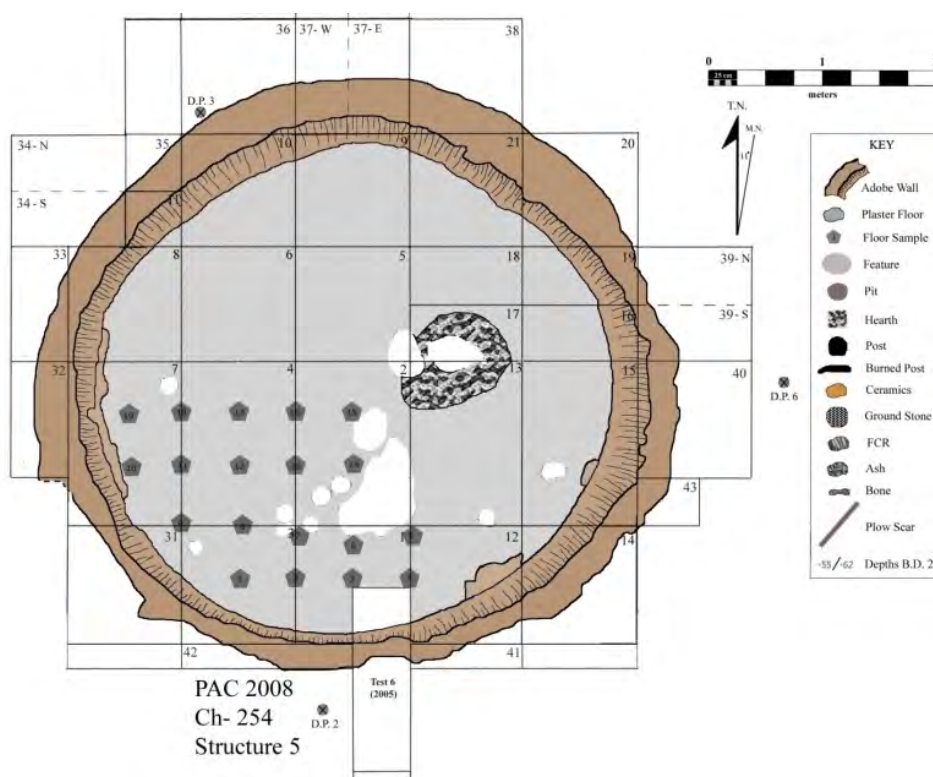


Figure 72. Floor 5BII, showing plaster sampling locations.



Figure 73. Structure 5BII, Features 49–51 and 54b. The arrows indicate Feature 54b, the narrow “step” feature next to the wall. Features 49–51 are possible post holes dug through Feature 54b.

Features 49, 50, and 51 were dug through Feature 54b, the adobe step (Figure 73). Their function is not clear. The fill of Feature 51 included burned adobe, charcoal, and little pebbles mixed in with the fill.

Feature 45, a larger pit, could have been an intrusion related to Feature 4 (a bowl on Floor 5B-I).

Feature 48, an irregular pit, was rimmed with compacted ash, charcoal, adobe, and fire-cracked rock. Despite the clear evidence for fire, Feature 48 does not seem to have been the main hearth for Structure 5BII (see below). Instead, it could have been an improvised hearth related to an earlier floor, or perhaps an ash pit for hearth waste.

Floor 5BII did not include an obvious posthole pattern relating to roof support. Since most of the pit features in Floor 5BII were directly beneath pit features in Floor 5BI, the former may be intrusive rather than part of the use of Floor 5BII. Chronological ambiguity could also be

introduced if any large wooden post associated with Floor 5BII continued in use after subsequent remodeling of the structure. One candidate for the latter scenario was recorded as Feature 27 in Floor 5B-I.

Feature 55 was a multi-component hearth slightly east and north of the floor's center. Judging by the reddening around and beneath the hearth (Figure 74), the latter was used over an extended period. During excavation we divided this feature into four loci.

Locus A was a 35 cm diameter pit, semicircular in profile, tightly packed with dark gray ash and charcoal covering some 10 pieces of round fire-cracked rock (the last 60 to 69 cm BD2). This pit seems to have been dug into the floor rather than modeled into the plaster.

Locus B, to the east, was a second pit, 30 cm in diameter, tightly packed with light gray to yellow ash (to a depth of 69 cm BD2).

Locus C was the area of reddened plaster around the two pits. Heat from the hearth had similarly modified the matrix under the plaster, to 13 cm below the floor level. A small concentration of sherds, burned adobe, and ashy fill with charcoal was found east and south of Locus C, below the level of floor 5B-II (61 to 62 cm BD2). These materials were in another pit not identified during the excavation, or else might represent an earlier and lower phase of the hearth.

Locus D was northwest of Locus A and consisted of a compact lump of fine dark gray ash, 10 cm in diameter, in a small pit (52 to 64 cm BD2). This locus was located directly above the hearth identified for floor 5C-b (Feature 70), but that might be a coincidence. We need to remember that the sizes of the two structures were quite different, as were the positions of the hearths within the structures.

Floor 5B-II seems to have been cleaned prior to abandonment. Except for a polished stone ball found in Unit 2 and the few sherds in the hearth area, few artifacts were associated directly with the floor.

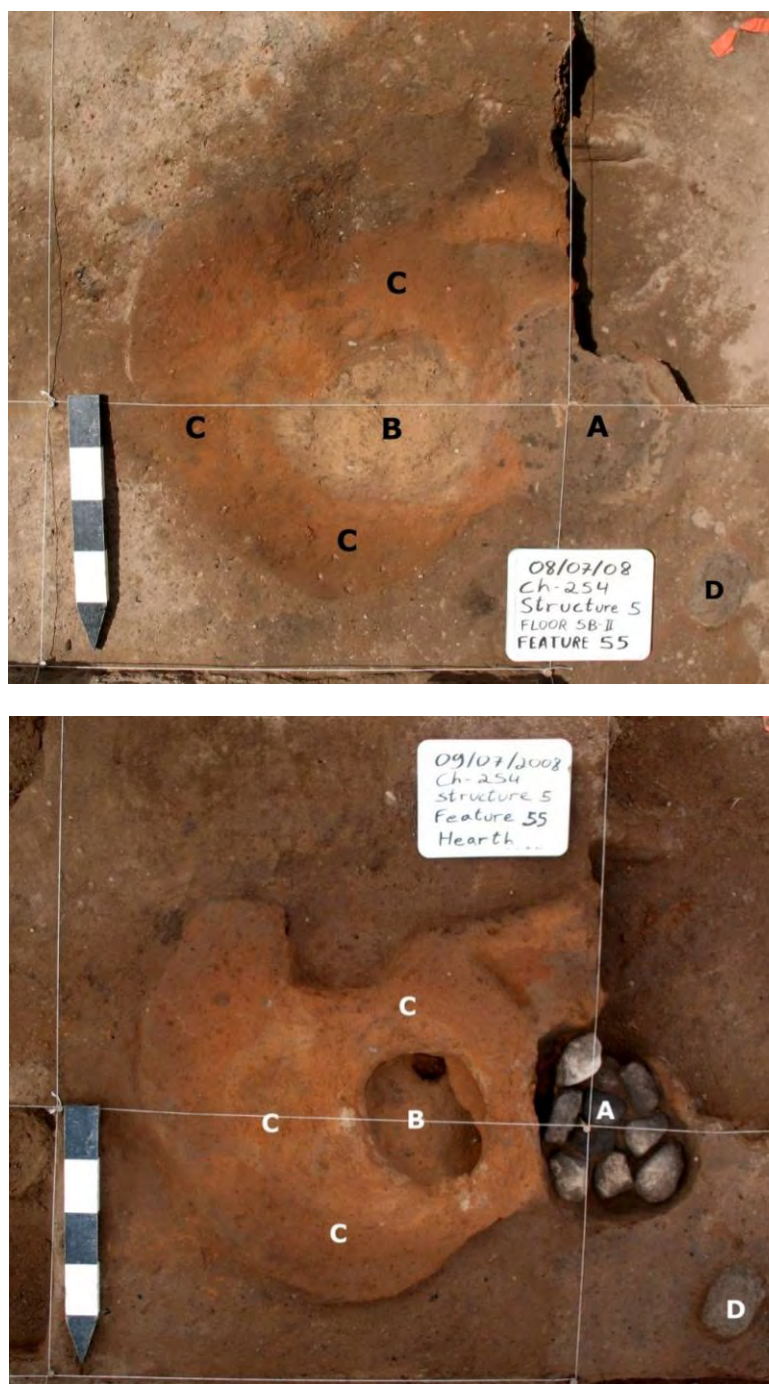


Figure 74. Floor 5BII, Feature 55. Top: the hearth area before excavation of the "Loci."
Bottom: after excavation of the "Loci."

Chapter 14

STRUCTURE 5BI

The next version of Structure 5 (Figures 75 and 76) included the addition of a course of adobe to the wall of Structure 5B-II. About 5 cm of loose, dark brown, sandy fill with small inclusions was then spread evenly over Floor 5B-II. The top of the fill was more compact, and mixed with orange adobe melt (Level 6). This served as the preparation for Floor 5BI.

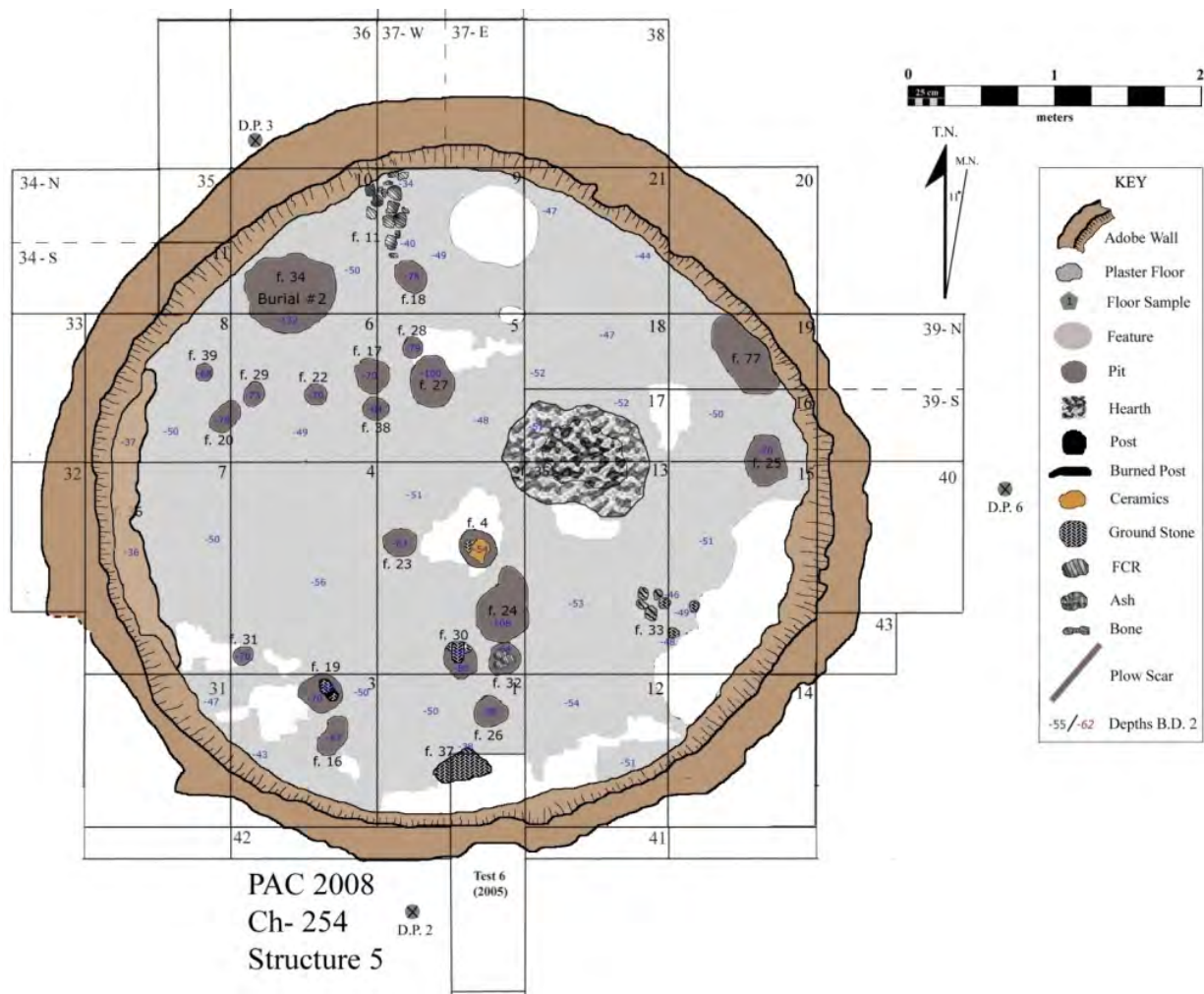


Figure 75. Plan of Structure 5BI and its associated features.



Figure 76. Structure 5BI after excavation. A baulk is still present in the northeast portion of the structure

Architectural Details

Floor 5BI consisted of a single plaster layer, 2 cm thick, applied to the floor preparation layer. As was the case with the floor below, Floor 5BI curved slightly upward at its edge to meet the wall. Floor depths were 44 to 50 cm BD2 to the north, 48 to 50 cm BD2 to the east, 43 to 51 cm BD2 to the south, 47 to 50 cm BD2 to the west, and 48 to 56 cm BD2 toward the center of the floor. In the southwest quadrant of the structure we observed a thin layer of white ash directly on the floor. Fifty-four samples of the floor were collected, with the exception of the baulk area in the northeast quadrant of the structure (Figure 77).

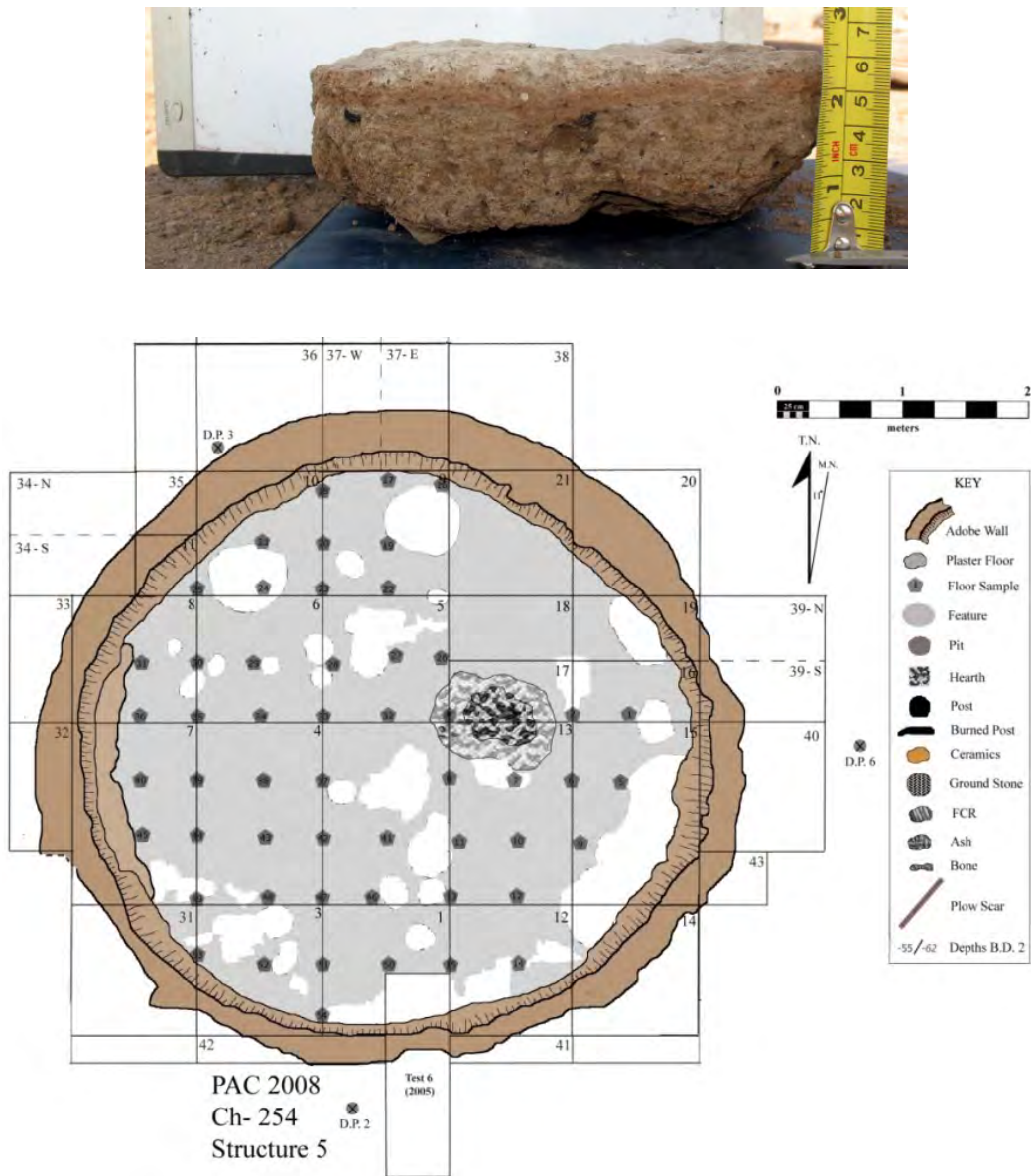


Figure 77. Floor 5BI, sampling program. Top: a sample of the plaster Floor, showing the compact ash layer. Bottom: sampling locations.

Feature 36 was an extension of the western adobe “step” (Feature 54b of Floor 5BII) created before floor 5B-I was laid (Figure 78). In its new configuration, the step measured 2 m along the inner face of the wall; the top was 36 to 37 cm BD2.



Figure 78. Floor 5BI, Feature 36.

Feature 35 was a hearth just east and north of the floor's center. The hearth was indicated by a slightly raised area of fractured plaster, with a white ashy center surrounded by gray to orange discoloration (Figure 79). The area must have been exposed to intense heat for an extended period, since the discoloration extended several centimeters downward into the floor preparation material. As was the case with the hearth in Floor 5BII, this was not a plastered bowl-shape hearth—but unlike the earlier hearth, the one in Floor 5BI lacked internal “loci.” The fire built on Floor 5BI may have been used with hearth stones or other items that were not preserved in place. The Floor 5BI hearth had the same exact horizontal provenience as earlier hearths (in Floors 5BII and 5Cb) and a later one (in Floor 5A).

Twenty-one pit features were identified in the floor (Features 4, 16–20, 22–32, 34, 38, 39, and 77). All were filled with dark brown sandy soil, with few inclusions. Feature 4 yielded a burnished ceramic vessel (probably a bowl) placed over a broken *mano* and a few pebbles. The fill of Feature 19 included a complete basalt maul (found 60 cm BD2). Feature 30 yielded a *d* mano and a broken maul (at 60 cm BD2). Feature 32 contained several pebbles and fire-cracked rock (at 64 cm BD2), but these contents might have been part of Feature 48 (see Floor 5BII). Features 24 and 27 were larger and deeper than the others, and might have been postholes (Figure 80). The horizontal proveniences of these two features was the same as those of two burned posts we found in Floor 5A (2007 Features 4). The burned posts did not extend below Level 4, however, and we found no evidence for posts in Features 24 and 27. If we are dealing with a careful repetition of a roof support pattern, as seems evident with the hearths, floor features were remembered and replicated during the architectural evolution of the house.



Figure 79. Floor 5BI, Feature 35.



Figure 80. Floor 5BI, Feature 27. The side of the feature reveals earlier floors (through Floor 5C).

Human Remains

Burial 2 of Structure 5 (pit Feature 34), of an infant, was in the northwest portion of the room, near the wall.¹ The grave was a circular pit, 60 cm in diameter, dug through the plaster of Floor 5B-I (starting at 53 cm BD2). The grave cut through floors 5B-II and 5C and sterile Level 10, and ended at the sterile clay of Level 11 (at 132 cm below BD2). The remains were placed directly on the clay bottom of the pit (Figure 81), and the pit was filled with loose, dark brown soil without inclusions. The hole in Floor 5B-II was then patched with plaster (slightly lighter in color than the original floor material) mixed with gravel.



Figure 81. Structure 5, Burial 2, in pit Feature 34.

The fill of the grave was excavated in four levels: A extended downward from the plaster floor (53 cm BD2) to 74 cm BD2. Level B extended from 75 to 83 cm BD2. Level C extended from 84 to 109 cm BD2. Level D extended from 110 to 132 cm BD2. The compactness and color of the fill did not change, but artifacts were confined to Levels C and D.

The infant was placed on its right side, in a flexed position. The long axis of the skeleton was oriented 50 degrees west of magnetic north (i.e., with the cranium toward the northwest), with the face facing to the southwest. (Ch 254 Skeleton 2, found in 1999, was similarly flexed, with

¹ Adult human bones, presumably from a disturbed grave, were found slightly below Floor A in 2007. This was designated as Burial 1 of Structure 5. Burial 1 as about 1 m west-southwest of Burial 2, also near the wall. No grave offerings were recovered from Burial 1.

its head to the west.) The top of the cranium was 121 cm BD2 and the bottom was 131 cm BD2; the top of the rib cage was 125 cm BD2; and the feet were 129 cm BD2.

The bones were so fragile that we exposed and released them by spraying them with water. Also, the bones began disintegrating as soon as they were exposed to the air (before then, the clay of Level 11 must have kept moisture levels high enough to allow the bones to survive). Finally, twice during excavation the burial pit was flooded with rain water. Because of the rapid deterioration of the tiny skeleton, most it (and its clay matrix) was enveloped in foil and turned over to INAH-Chihuahua.

A few bones were exported for aging and for isotopic analysis (see below). Andrea Waters-Rist, in Dr. M. A. Katzenberg's isotopic laboratory, placed the age of the individual between 6 and 18 months. No pathologies were visible on the available bones. Ms. Waters-Rist also prepared the sample for the isotopic analysis. Dr. Katzenberg noted that the carbon and nitrogen values fit well with the results from three adult individuals from the same site, excavated in 1999 (see Webster 2001 and Webster and Katzenberg 2009). The nitrogen values for the infant were about 2 points higher, as is to be expected with a nursing infant.

The infant was buried with numerous burial goods, most of which found in Level D. Shell beads (940 in all) were found surrounding the body from head to toe, with the largest concentration over the torso and the legs (Figures 82–84). Many of the beads seemed to be arranged in strands around the neck and torso, so a long necklace may have been wrapped several times around the infant. Or perhaps strung beads were sewn onto a burial shroud. Several beads found in the bottom of Level C (at 109 cm BD2) were intentionally deposited in the fill after the infant's body was covered, or else were transported upward by soil perturbation.

Several types of shell beads were identified, including large and small disc, bi-lobed, and inverted T shaped; many of the beads were found sticking to each other, presumably as they were strung. If so, different types of beads were strung together. The larger disk beads were generally produced from a darker part of the shell than the smaller ones, but numerous beads were bichromatic. A few *Olivella* beads and local land snails were included in the assemblage.

A subrectangular shell pendant with three perforations was placed either at the chest or near the knees. A compact lump of clay was found just the west of the skeleton; it may have been placed there intentionally, or perhaps was part of Level 11.

The most striking piece included with the burial was a pendant, 5.5 cm in diameter, placed east of the infant's feet (Figure 85). It appears to consist of an unknown, dark, probably organic substance (pitch?) molded around a core. A seam around the edge of the piece shows that the flat front and curved back were created separately. The front of the piece was inlaid with a central turquoise disk surrounded by four "arms" created with pieces of orange stone, with a half-moon-shaped piece of turquoise at the end of each "arm." The piece was submitted to INAH's conservation department in Mexico City.



Figure 82. Structure 5, Burial 2, showing the infant skeleton and shell beads. Looking northeast



Figure 83. Structure 5, Burial 2, showing the infant skeleton and shell pendant . Looking northwest.



Figure 84. Beads and shells found with Structure 5, Burial 2. Vertically, the clusters reflect the items' position relative to the infant (top: items at the head; bottom: items at the feet). For the large clusters of items, the left column includes of bi-lobed beads, the center-left column includes purple to white shell beads, the center-right column includes stuck-together beads of all types, and the right column includes small, thick, shell beads. The items above the large clusters include the T-shaped beads, *Olivella* beads, other minor types, and the large shell pendant.

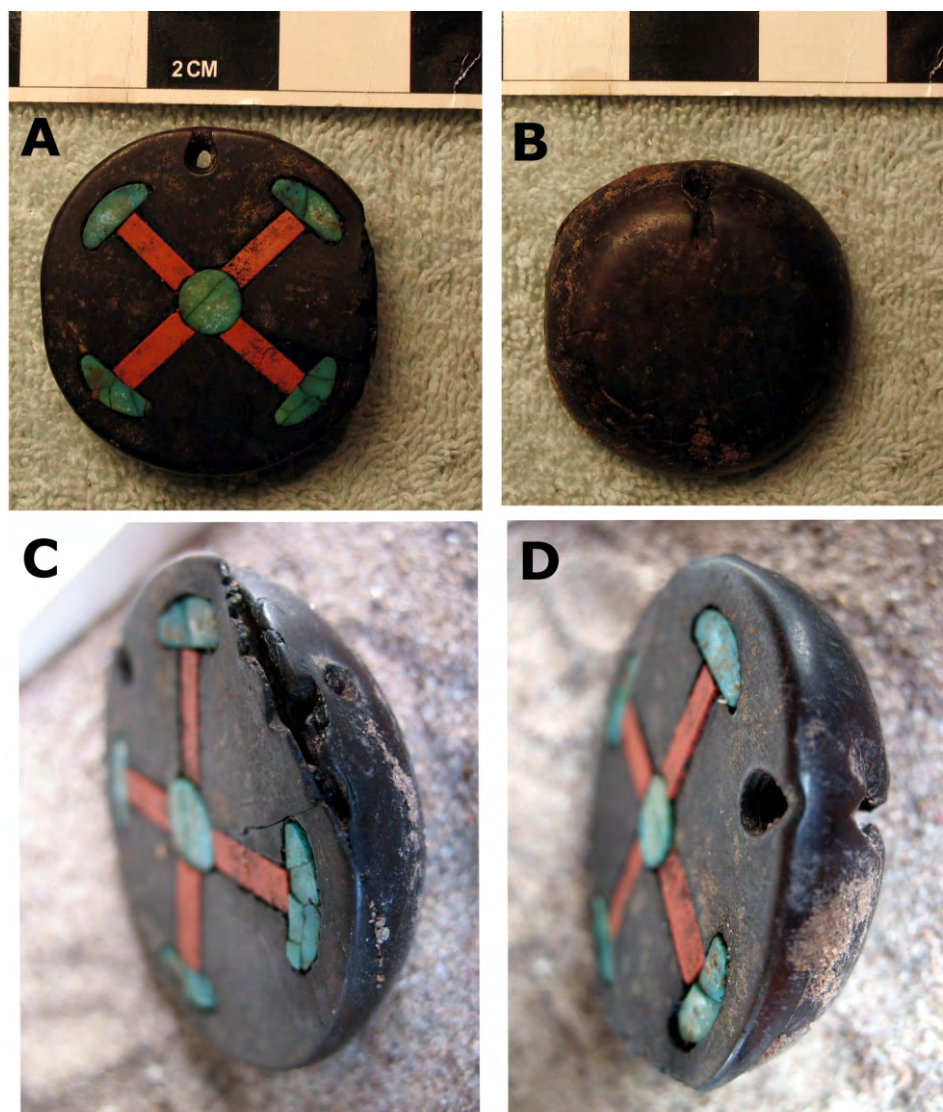


Figure 85. Ornate pendant from Structure 5, Burial 2. A: front. B: back. C: side view, showing the separation of the two exterior surfaces of the pendant. D: one of two suspension holes.

Stable Isotope Analysis of Collagen from Structure 5, Burial 2

Andrea Waters-Rist

The bone sample was cleaned ultrasonically, dried, and soaked in 1 percent hydrochloric acid (HCl), which was changed 17 times until all mineral was removed, following Sealy (1986). The remaining organic material was soaked in a 0.125 solution of sodium hydroxide (NaOH) for 20 hours in order to remove any humic or fulvic acid. The resultant collagen was then rinsed to neutrality and freeze-dried.

Collagen was analyzed on a Finnigan Mat Delta+ mass spectrometer interfaced with a Carlo Erba gas analyzer, in the Isotope Science Laboratory, University of Calgary, under the direction of Stephen Taylor. Isotope ratios are reported in per mil (‰) relative to V-PDB for carbon and AIR for nitrogen. Precision of analysis is for both $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ are 0.2 ‰ as determined by repeat analyses of an internal laboratory standard. C/N ratios as well as %C and %N are provided by the Carlo Erba gas analyzer.

$\delta^{13}\text{C}$: -7.3

$\delta^{15}\text{N}$: 14.1‰

Atomic C/N Ratio: 3.4

%C: 44.1

%N: 14.0

Collagen Yield: 5.37

Other Features

Three other features—consisting of artifacts, not architectural details—were directly associated with Floor 5BI. These features indicate that the floor was not cleaned as meticulously before abandonment as the earlier floors.

Feature 11 was a concentration of about 15 pieces of fire-cracked rock, along with a rhyolite core and a broken mano, abutting the north wall. Most of these items were found 34 to 40 cm BD2, but some of the fire-cracked rock was “floating” a few centimeters above the floor, in Level 5 (see below).

Feature 33 consisted of three small ground stone balls and four pebbles, found 46 to 48 cm BD2. One stone ball was pitted on two sides, as if it had been used as a hammerstone.

Feature 37 was an overturned rhyolite metate fragment, found 38 cm BD2. This was the same flat stone recorded in the north profile of Test 6 in 2005, and left *in situ* at the time

Fill Postdating Floor 5BI: Levels 3–5

Levels 3–5 accumulated between the abandonment of Floor 5B-I and the creation of the floor of Structure 5A (Figures 86 and 87). The distinction between the three levels was clearest on the west side of the structure, less visible on the east side. The plowing that disturbed the floor assemblage and floor of Structure 5A had also reached these levels. Sherds belonging to the partially reconstructible pots removed from Floor A (in 2007), and additional human bones thought to be part of Burial 1, were identified in Levels 3 to 5. The most intense rodent activity anywhere in the structure was also observed in these levels.

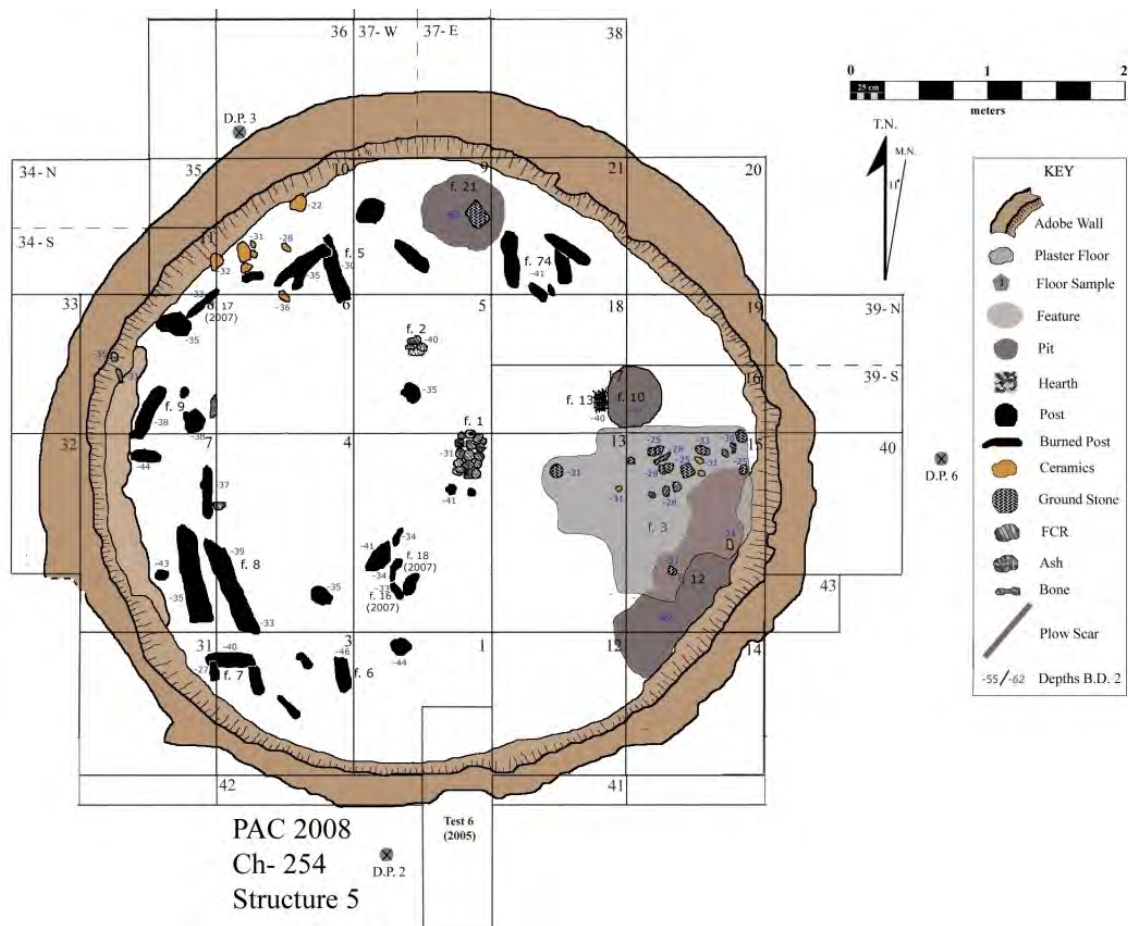


Figure 86. Structure 5, plan of Levels 3–5 and associated features.



Figure 87. Oblique view of Structure 5, Levels 3–5. Looking north.

Level 5 consisted of light orange, loose fill with many inclusions, overlying Floor 5BI. This was thickest in the center and east portion of the structure (rising as much as 18 cm above floor 5BI), and entirely absent in the southeast quadrant of the structure (Figure 88). Level 5 seems to represent a gradual accumulation of fill following the abandonment of Floor 5B-I, possibly from the disintegrating roof and wattle-and-daub walls of the structure. Although Structure 5 did not continue in use as domestic space, Level 5 yielded evidence of limited activity within the structure, in the form of Features 11 and 2. Feature 11 was the concentration of fire-cracked rock partly associated with floor 5B-I. Feature 2 (at 40 cm BD2) consisted of four flat pieces of fire-cracked rock, on top of small nodules of white ash.



Figure 88. Stratigraphic relationships of Floors 5A and 5BI and Levels 3 and 4.
In this part of Structure 5, Level 5 was absent.

Feature 1 was a hearth built on top of Level 5, 10 cm above Floor 5B (at 31 cm BD2) (Figure 89). This consisted of at least 30 small fire-cracked pebbles and a pebble with a ground depression, mixed with charcoal and ash and clustered in an measuring 35 cm north-south by 20 cm east-west. Horizontally, this was in the general location of the earlier hearths in floors (5Cb, 5BII, and 5BI), although slightly to the west of them.

Level 4 overlay Level 5 in some places, Floor 5BI in others, and consisted of dark gray, very loose soil mixed with charcoal, small adobe fragments, and gravel. The associated features suggest that the interior of Structure 5 served as an activity area between uses as domestic space (i.e., after abandonment of Floor 5BI and before the creation of Floor 5A). Also, a cluster of sherds was found in Levels 4 and 5 in the north part of the structure. The rather mixed nature of Levels 4 and 5 suggest that these were forming almost simultaneously.

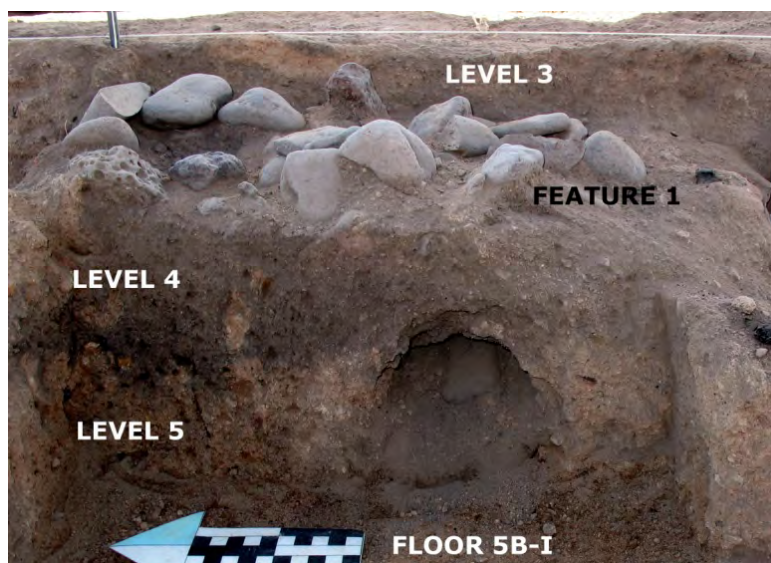


Figure 89. Structure 5, Feature 1, a hearth. A rodent hole can be seen between the hearth and Floor 5B-I.

The most distinctive features in Level 4 were eight clusters of burned beams (2008 Features 5–9 and 74; to these must be added 2007 Features 16–18, found below Floor 5A) (Figure 86, 87, and 90). While most of the beams were charred throughout, some still retained an unburned core. The beam clusters were restricted mostly in western and northern parts of the structure; they were found from 30 to 45 cm BD2.



Figure 90. A burned beam in Structure 5, Level 4.

Smaller chunks of charcoal were found throughout Level 4. At the west side of the structure, all of the beams were found on top of Level 5 or in Level 4; several beams in Features 5 and 74 were found lying directly on floor 5BI. The northernmost beam of Feature 5 extended over the concentration of fire-cracked rock at Feature 11. Feature 13 consisted of a charred bundle of grass found on top of Level 5 (at 40 cm BD2), and might have burned at the same time as the beams.

The most likely explanation for the burned beams is that before burning, they were part of Structure 5BI. In that case their stratigraphic position indicates that before the superstructure burned, some fill had accumulated on Floor 5B-I. If the superstructure was in place for a while after abandonment of the room, however, we might expect to find charred remains of posts still in their respective holes in Floor 5B-I. As that was not the case, the exact meaning of the burned beams eludes us.

Features 10 and 12 were pits in the eastern part of the structure. They were filled with dark brown sandy soil with few natural inclusions, and seem to have been trash pits.

Level 3, the sub-floor preparation for Floor 5A, consisted of 5 to 10 cm of compact orange to brown adobe melt material, with pockets of darker soil, on top of Level 4 and its associated features. The builders of Floor 5A chose not to remove the features (including the burned beams) associated with Level 4, even though the earlier remains could have weakened the plaster floor. Interestingly, Floor 5A did not preserve well on the west side of the structure, where the burned beams were clustered.

Feature 3 seems to have been associated with Level 3 (at 25 to 31 cm BD2). This feature was a large, distinct lens of light gray clay and ash, with charcoal flecks and a few inclusions, occupying most of Unit 15 and part of Unit 13. Embedded within the feature material were sherds, several pieces of ground stone (including two nearly complete mauls, large stone balls, and a mano fragment), and broken rocks (Figure 91). The purpose of this feature is unclear, but a favorite field guess was that it served as an offering before the plastering of Floor 5A. Feature 3 partly overlay pit Feature 12 of Level 4. The matrix beneath and immediately surrounding Feature 3 was mottled and mixed, suggesting that Levels 4 and 5 were disturbed by the feature.

Feature 21 was the same pit as Feature 73, which was canceled. Feature 21 was a large pit cut from either Level 3 or floor 5A, and filled with gray, loose, sandy soil with gravel and charcoal. A metate fragment was found in the feature fill (at 21 cm BD2). Feature 21 may have been a trash pit.



Figure 91. Structure 5, Level 3, Feature 3.

Chapter 15

STRUCTURE 5A

The portion of Structure 5 down to the uppermost floor, designated Structure 5A, was excavated in 2007 and 2008 (Figures 92 and 93). Just before the placement of the Level 3 fill and Floor 5A, the wall of structure 5BI was reinforced by adding an adobe “buttress” to the internal face of the east and west sides of the wall (Features 78 and 79 respectively) (Figure 94). The adobe was applied while Level 4 was still exposed, but did not go deeper than that level. This evident from the burned beams of Feature 7, which were partly covered by the added adobe addendum. The western “buttress” was 25 cm wide and 3.5 m long, while the eastern one was 15 cm wide and 1.5 m long. The purpose of the remodeling was either to extend the internal “steps” (Feature 54) or to strengthen the adobe walls, which must have been decades old. The western side of the structure, where the probable entrance to the structure was located, seemed particularly in need of strengthening.

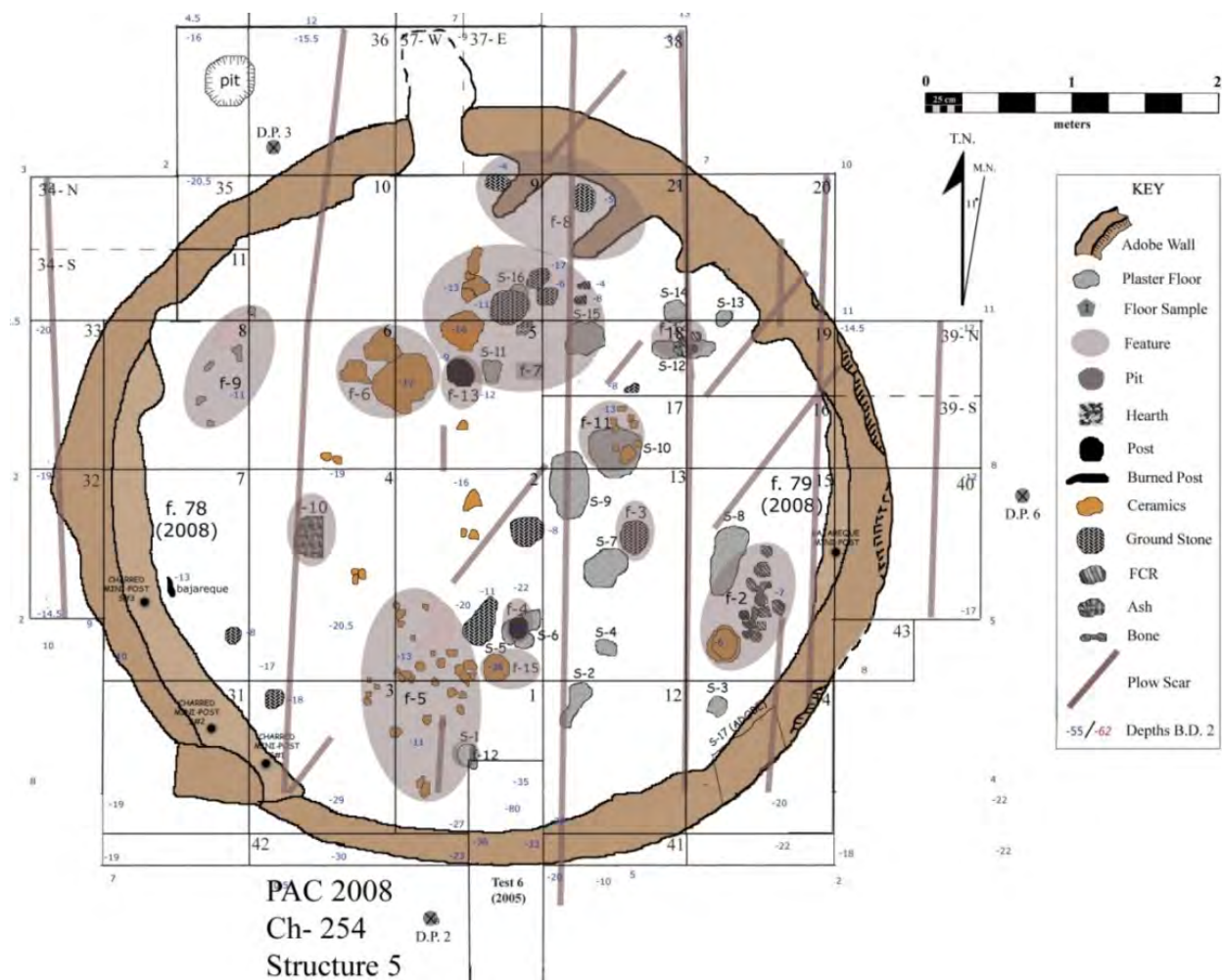


Figure 92. Plan of Floor 5A and its associated features.

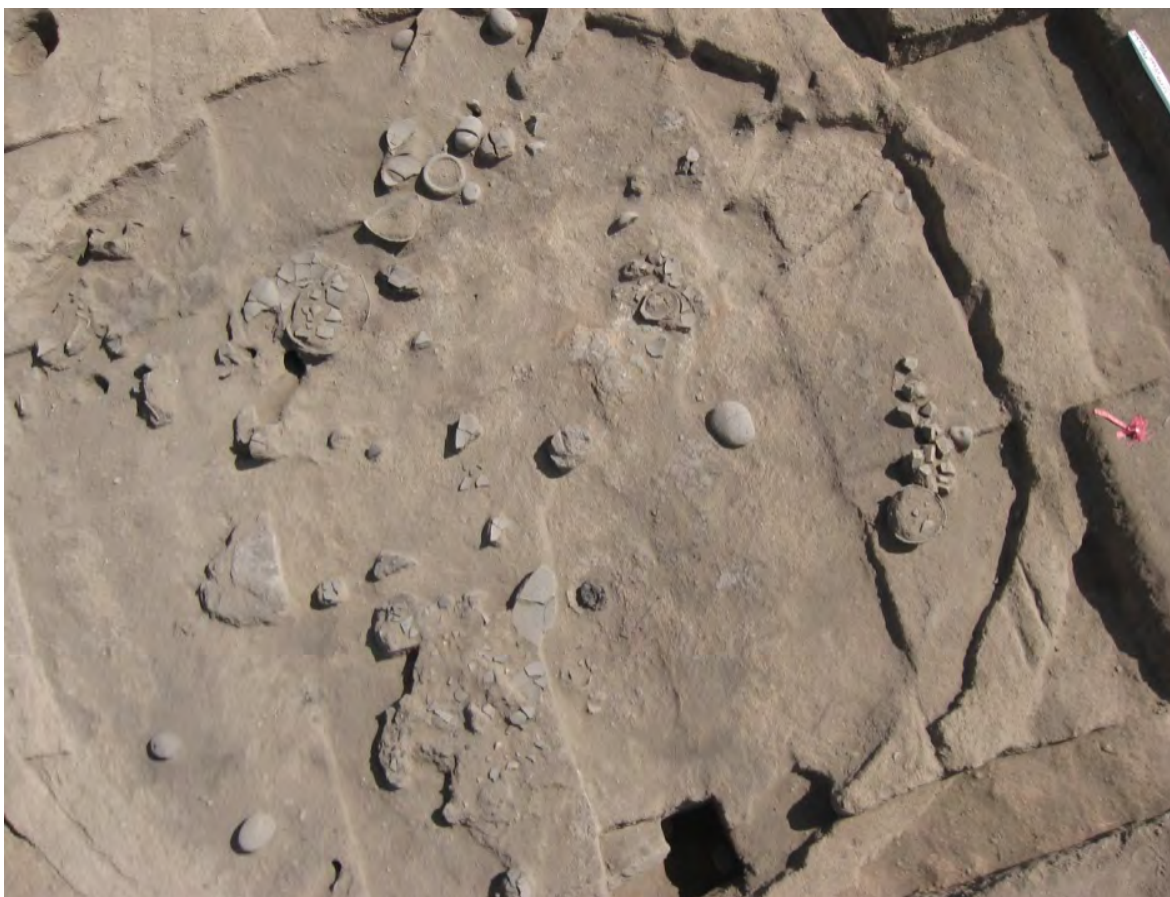


Figure 93. Structure 5A after excavation of the floor. The cleaned-out 2005 Test 6 is at the bottom of the picture. In this photo, the north-south line is rotated slightly counterclockwise; the grid and main plow marks extend north-south.



Figure 94. Wall 5A, showing the adobe “buttress” (Feature 78) over Wall 5BI-II.

Architectural Details

A low adobe wall base encircled the single room; the wall base was slightly less curved on the east and west sides of the structure. Burned “mini” posts set into the top of the remaining wall base, on those same sides of the structure (Figure 95), suggest a pole-frame and *bajareque* superstructure rather than an adobe upper wall. Very little fallen adobe was observed within the excavated area, but melted adobe is frequently described in the excavation notes. The only possible solid chunk of adobe wall fall was found in the north side of the house, near the floor assemblage labeled Feature 3.



Figure 95. A “mini” post in the west wall base of Structure 5. The squares on the scale measure 1 by 1 cm. Photo by Danny Zborover.

Structure 2 also had small poles set in an adobe matrix, offering a precedent for this sort of construction. However, in Structure 2 surviving poles were angled inward in such a way that a domed structure was likely. The Structure 5 “mini” posts appear to have been placed vertically, indicating a vertical wall.

Two low adobe extensions into the room appeared to be continuous with the wall base, suggesting a small alcove, but remain questionable (see Features 7 and 8, below).

Two support posts for the roof were located toward the center of the structure, in a NNW-SSE line (an orientation is quite similar to that for the two-post system in Structure 2). The posts measured about 20 cm across at the floor level, which seems inadequate for bearing the weight of a roof. Either there were additional interior roof support posts or the roof was light and partly supported by the “mini” posts found in the structure’s wall base. In the latter case, entry must have been through the side of the structure, not through the roof.

Although there were remnants of clay flooring, especially around the two roof support posts, much of the floor surface had been destroyed. In those areas, the floor was marked by the distribution of the inferred floor assemblage. No formal fire pit or other interior formal feature was present, but an ash concentration was found in the western portion of the room and burned areas were found in the eastern portion of the room.

Structure 5A had burned, based on the following evidence. The soil just above the floor was mixed with charcoal fragments and ash. This ashy stratum was mostly visible in the profile as a slightly darker layer below the brown plow zone soil and the light brown adobe melt and floor. The floor or underlying deposits (or both) had been exposed to high temperatures in several places. The two known interior posts (Features 4 and 13) were charred only above the floor level. Similarly, the “mini” posts embedded in the wall base were charred only above the surviving wall base. Some of the reconstructible pots in the inferred floor assemblage were blackened. Finally, the extensive floor assemblage suggests sudden abandonment—something explained by unplanned destruction of the house by fire.

The 2007 excavation continued slightly below the level at which floor remnants and most of the floor assemblage artifacts were clustered. For remains exposed during that effort additional effort and probably part of the fill above Floor B, see Features 5, 17, and 18 (below). It was not clear whether Feature 15 was related to the 5A floor or to the deposits below.

Features

Most of the 18 numbered features were not architectural elements, but in situ artifacts and artifact clusters (Figure 96).

Feature 1 consisted of parts of three or four vessels, as well as other sherds, found near Unit 4 of South Trench W. These were not part of the floor assemblage but were assigned a feature number to designate the concentration of pottery. The sherds included a body wall from a partly scored jar, with blackening on the lower portion of the wall. A larger, thicker body wall came from an undecorated vessel with an estimated diameter of 34 cm. A jar shoulder had patterned scoring over most of its exterior surface, and corrugations on the lowest part of the sherd. Two round protuberances on the upper shoulder could represent a broken handle (Figure 97).

Feature 2 consisted of two vessels stacked on the floor in the east portion of the room, next to a cluster of fire-cracked rock (and three pieces of fire-cracked rock were removed from over the vessels) (Figure 98). The lower vessel was the lower portion of an olla that had been cut in two horizontally, creating a bowl. The incomplete upper vessel was a jar with neck banding and red-on-brown designs (Figure 99).

Feature 3 included a circular mortar and an oval stone bowl broken into three pieces (Figure 100).

Feature 4 was the more southerly of the two interior support posts.



Figure 96. Features in the north-northwest quadrant of the house. At the upper left is Feature 13, the northwest roof support post. Feature 6 (a large, partly corrugated olla) is in the upper left quadrant of the photo. Just below the middle of the photo, a string crosses the base of a large polychrome jar. Stone tools of Feature 3, in the lower right quadrant of the photo, include a stone mortar, a small hand stone, and a mano. Photo by Rafael Cruz Antillón.



Figure 97. Large sherd from Feature 1. The image has been manipulated to bring out the scoring over most of the sherd exterior. Two possible handle scars are present at the top of the sherd, and the start of a corrugated area can be seen at the bottom of the sherd.



Figure 98. Feature 2. Note the stacked pottery vessels and a cluster of fire-cracked rock.
Photo by Rafael Cruz Antillón.

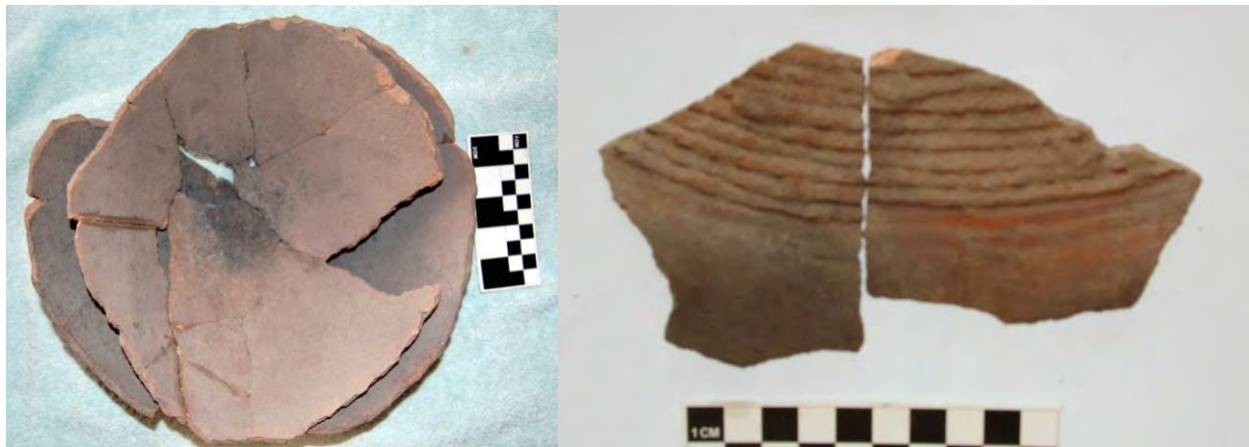


Figure 99. The two partial vessels of Feature 2. Left: The vessel bases, stacked as found in the field. Right: two conjoining sherds of the upper vessel, showing the neck banding and traces of a red-on-brown design.



Figure 100. Feature 3, mortar and stone bowl.

Feature 5 was located near Feature 4. The artifacts included in this area included a flat stone with a ground surface, broken into three pieces (Figure 101), and most of a broken polychrome jar with a black background (see below). A small fragments of burned log was also recorded as part of Feature 5, but was found below the inferred floor level and more likely is part of the fill above Floor B (see also Feature 18).



Figure 101. Feature 5, flat stone with ground surface.

Feature 6 was part of a large olla, found in the northwest sector of the structure. A faded red design is present below the textured neck (Figure 102). The jar was set into the floor, near the northwest main roof support post, and probably served as a stationary water jar.



Figure 102. Feature 6, olla. Top left: during excavation. Top right: during reconstruction in the lab; the faded design is below the corrugated neck. Bottom: the texturing on the neck.

Features 7 and 8, combined, included a concentration of stone artifacts and much of a polychrome vessel with a black background, in the northern sector of the house next to the north wall (Figure 103). This area also included two small, low adobe “wing walls” extending into the room. Conceivably the “wing walls” were instead fallen wall sections, or something equally unrelated to the design and use of the room—but if so, there were no visible joints between the “wing walls” and the wall base encircling the structure.

Feature 9 was in the northwest sector of the structure, just west of Feature 6, and contained scattered human remains and *bajareque*. Below the human remains was a horizontal burned timber (Feature 18).

Feature 10 was an ash concentration, 3–5 cm thick, in the west-central portion of the house (Figure 104).



Figure 103. Features 7 and 8, artifact cluster. The tips of the possible “wing walls” appear at the top of the photo. Photo by Rafael Cruz Antillón.



Figure 104. Feature 10, ash concentration.

Feature 11 was a concentration of sherds from a large undecorated olla.

Feature 12 was a floor fragment, in the northeast corner of Unit 6, that demonstrated multiple layers of floor plaster. Floor sample No. 1 was collected from this feature.

Feature 13 consisted of sherds from the olla of recorded primarily as Feature 6. The sherds were on top of a post remnant (Feature 16) and appeared to have been displaced by plow action.

Feature 14 consisted of materials from the “tusa hole” (burrow) that underlay both Feature 16 (a post) and Feature 6 (olla sherds).

Feature 15 was a concentration of sherds (from a partly reconstructible pot) southwest of Feature 3 and east of Features 5 and 18. Feature 15 was encountered below the 5A floor level; it must be related to either the 5A floor deposits or to the fill below that floor level, but we could not tell which.

Feature 16 was more northerly of the two charred interior posts.

Features 17 and 18 were horizontal timbers found below the 5A floor level, and pertaining to an earlier occupation. The features were encountered below human remains found in the northwest part of the structure (see below).

Pottery

As is so often the case, the counts by category yield quite different percentages if one uses sherds in general or just rims (Table 31).¹ The largest difference is seen in the Undecorated category, which accounts for 72 percent of the total sherds but only 34 percent of the rims. This reflects the fact that locally made red-on-brown vessels tended to have plain lower bodies. Similarly, red slips and painting on textured and Santa Ana Polychrome vessels often extended no farther down than the shoulder.

If we consider only rims sherds, Table 31 suggests that one in three bowls and jars was undecorated. However, some vessels had plain rims and decorated areas farther down, so this estimate may be on the high side.

Table 31. Pottery from the Structure 5 Excavations in 2007.

	Undec.	Black	Red-slipped	Red-on-brown	Text.	Poly-chrome	Combo	Mimbres	Other	Total
<i>All Sherds</i>										
Count	6007	551	308	411	876	242	36	3	117	8551
Percent	70.2	6.4	3.6	4.8	10.2	2.8	0.4	0.0	1.4	
<i>Rims</i>										
Count	109	23	38	66	31	8	0	1	16	292
Percent	37.3	7.9	13.0	22.6	10.6	2.7	0.0	0.3	5.5	

A rare form that occurs in both late Viejo and Medio period contexts is a flanged jar that appears as if the top part of a jar is sitting in a bowl, leaving a projecting flange (Figure 14). Three sherds from such a vessel came from the fill over Floor A of Structure 5 (one is shown in Figure 105). All were from a plain brown vessel. The form also occurs on red-slipped and polychrome vessels in other assemblages.

¹ In Table 31, “Combo” sherds are those that combine two or more categories of decoration, for example, textured sherds with red painted designs. “Other” sherds include those that do not display the usual (and presumably local) techniques or designs. The black-background polychrome described later falls in the Other category, along with sherds with soft white paste and surfaces with either corrugations or red line decorations, yellow-tan sherds from a small, thin-walled jar with a “pleated” corrugated neck and plain body, sherds with cream pastes and red-on-cream exteriors, an unidentified black-on-white sherds, and sherds with bands of black or yellow-orange slip on the rims.



Figure 105. Three examples of pottery from the Structure 5 excavations. Upper left: flange from a brownware vessel (Lot 2593). Lower left: sherds with appliqué or modeling. South Trench, Test 3E, plow zone (Lot 2586). Right: large section of an undecorated brown olla. South Trench, Test 4E, Feature 1, plow zone (Lot 2623).

Textured sherds show a variety of treatments, including corrugation of various sorts, incised corrugation, scoring, pattern scoring, and, on a few sherds, appliqué or modeling (Figures 105 and 106). Some of the textured designs closely follow the chevron and branching designs seen on some Viejo period red-on-brown and polychrome sherds. A few sherds with pattern scoring have what we call the “tire track” design, which seems to have been made with a tool with four tines, with a total width of 0.5 to 1.0 cm. The use of a tined tool is most clearly seen on scored vessels on which the individual tooled lines are distinct.

In the Combo category, textured sherds with red paint include examples with red slip bands on or over lips (reminiscent of Pilón Red Rim), and also sherds applied over or at the edges of textured zones. Unusually, the partly reconstructed jar in Figure 107 has traces of oblique red lines inside the neck of a polished brown jar.

Structure 5 yielded sherds from two vessels of black background polychrome (Figures 108 and 109). The sherds were concentrated in Feature 5, in Unit 6 (Lots 2625 and 2690), in the southern part of the house, and in Feature 7/8 in Units 21 and 23 (Lot 2611). Additional sherds of the type were scattered on the floor of Structure 5A, and also outside the structure. To our knowledge, this polychrome type has not been found elsewhere; until it is, we prefer to not give it a name. The black background is deliberate. In the most intact example, an angular design in red and silvery white covers the middle and shoulder of the jar body, while the base is slipped chocolate brown (Figure 108). A zigzag pattern is present on the jar neck, below a red slip band on the rim (Figure 109). The volume of this vessel was estimated by Louis Irwin and Donna Byers (both of the UTEP Department of Biological Sciences) to be about 15 liters (4 gallons).



Figure 106. Three examples of texturing. Top left: a scored jar rim from Feature 15 (Lot 2638). This image was manipulated to bring out the scoring, which was produced by a tool about 1 cm wide. Such tool scoring was referred to by the project as “tire track” scoring. Top right: a rim with vertical texturing, resulting in a pleated appearance (Unit 14, Level 1; Lot 2607). Bottom: part of small jar with neck corrugations, the latter partly obliterated by vertical incising. North Trench East, Test 2, Plow zone (Lot 2585).



Figure 107. Two views of a partly reconstructed jar. Left: interior view. Note the traces of oblique red lines on the neck. Right: exterior view, showing black and reddish areas. (Lot 2630)



Figure 108. Partly reconstructed “black background polychrome” jar. Note the red-and-silver design on the body, the silver zigzags on the neck (more evident in Figure 109), the red lip, and the chocolate brown base. From Structure 5A, Feature 5.



Figure 109. Neck of the partly reconstructed “black background polychrome” jar.
Note the silver vertical zigzags below the red rim.

In this postmodernist age, we may note that the angular design over the body is somewhat reminiscent of snakes or rainbows, while the zigzags suggest lightning; taken together, the designs may be water symbolism. The silvery white lines may derived from an iron-free white clay, or the paint recipe may be the same as for the nominal black lines on Santa Ana and Babícora Polychrome (on local examples, those lines are often burned out or turn a silver-white color).

The sherds indicate the existence of a second black background polychrome vessel, in this case with a chocolate brown slip on the lip and also in places on the shoulder, in addition to the red and silver-white lines. Figure 110 shows additional sherds of this polychrome type.

The red-on-brown sherds (Figure 111 and 112) are from both jars and bowls. The painted designs include lines, triangles, and triangles with interior hachure. Line width and execution vary, and only a few sherds fall cleanly into the types defined by Di Peso and his colleagues for Paquimé. Most of those that do fit the northern zone types were classified as Anchondo or Mata Red-on-brown.



Figure 110. Sherds derived from “black background polychrome” vessels. Left: polychrome sherds with a black background, from Feature 5 (Lot 2625). Right: sherds of black background polychrome and of the chocolate brown-slipped shoulder, from Test 10, Level 1 (Lot 2505).



Figure 111. Red rim bands on “black background polychrome” sherds. From Feature 5 (Lot 2625).



Figure 112. Red-on-brown sherds, showing the variability in painted designs.
From Test 9, Level 1 (Lot 2593).

Several sherds came from a tan-yellow vessel that is unique within the PAC assemblages. The original jar was about 20 to 22 cm tall and had a vertically pleated neck (the pleats being about 5 cm long) and a sharply everted rim (Figure 106). The sherds were found in Test 8, Level 1 (Lot 2592); Test 9, Level 1 (Lot 2593); Test 14, Level 1 (Lot 2607); and Test 14, Level 2 (Lot 2643).

The three Mimbres sherds came from the plow zone of the South Trench (Lot 2576) and from Level 1 of Tests 14 and 25 within the house (Lots 4523 and 2620). As we noted earlier, plowing had reached the floor in places, but it seems reasonable to associate the Mimbres sherds with Structure 5A, the latest incarnation of the house established at this spot.

In 2007 we were excavating the Calderón Site and the Quevedo Site (Ch-218) at the same time, and since the two sites are 12 km apart and more or less contemporaneous (Kelley and Garvin 2012), we were always comparing the pottery from the two sites. At the time we perceived a common emphasis on red-slipped lips, on the use of combinations of decorative techniques, and on the relative emphasis on red versus black wares. Pottery was less abundant at the Quevedo Site, however, and polychrome and imported Mimbres sherds were rarer at that site.

Other Artifacts

The flaked stone assemblage is heavily weighted toward flakes and shatter without macroscopic signs of use-wear or modification. Of the 1,441 pieces of flaked stone, some 1,150 were tabulated as unworked flakes, snapped flakes, and shatter. The assemblage also includes 138 cores (mostly flake cores), 142 pieces that may have been utilized (but many may have post-depositional edge damage), seven pieces with definite retouch (both bifacial and unifacial), and four shaped tools. The two points, shown in Figure 113, came from Test 27, Level 1 (Lot 2621) and Test 14, Level 1 (Lot 2607); they resemble other Viejo period examples. One quartz crystal had obvious signs of use (south trench, Test 2, Feature 15 [Lot 2618]). A small obsidian biface came from Test 26, Level 1 (Lot 2622).

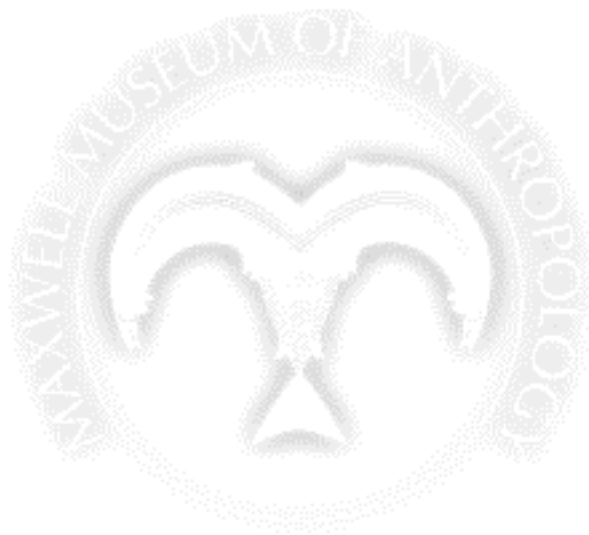


Figure 113. Two points from the Structure 5 excavations. Left: from Test 14, Level 1. Right: from Test 27, Level 1.

As was the case at the Quevedo site, the raw materials are dominated by rhyolite (86 percent). Other raw materials included basalt (of various grades; 1 percent), chert (2 percent), quartzite (2 percent), chalcedony (< 1 percent), obsidian in the form of “Apache tears” (1 percent), the quartz crystal, and unknown (including granite-like; < 1 percent). The retouched and shaped tools were mostly made of fine-grained basalt, chert, and obsidian. Except for the granite-like material and perhaps the obsidian, the raw materials were locally available (coarser basalts and rhyolites were common in the adjacent arroyo).

Fifteen ground stone items were recovered from Structure 5 and its environs. These included two stone bowls (Figure 100), five mano fragments, two flat ground stones, three axe head fragments, and two cobbles (found on the floor, and probably used as house furniture). Ground stone items were illustrated as part of the feature descriptions.

A Vermetid bead (1.3 cm long and 1.1 cm in diameter) came from the South Trench, west side (Lot 2587), as did a piece of cut mussel shell. Unworked local mussel shell came from multiple lots (2582, 2584, 2588, 2590, 2591, 2592, 2597, 2602, 2603, 2604, 2607, 2610, 2612, 2623, 2624, 2625, and 2650). Although it was fairly ubiquitous, only a few fragments, at most, were found in any one part of the structure.



Chapter 16

OTHER STRUCTURE 5 AREA EXCAVATIONS

Cultural Deposits Under Structure 5

Level 9 was the lowest cultural level excavated in 2008 (Figure 114). It predated the construction of Structure 5C and probably represents the earliest occupation in that part of the site. A 1 by 1 m unit (Unit 2-S; Figures 115 and 116) that exposed a hearth (Feature 57), two narrow trenches that followed the internal and external faces of wall 5C in Units 12 and 15, and a deep pit (Feature 59) pertain to this level (Figure 114). Floor 5C was built directly on sterile Level 10 in the northern part of Structure 5; Level 9 was found only in the southern part of the excavation area, but may have extended to the east and west.

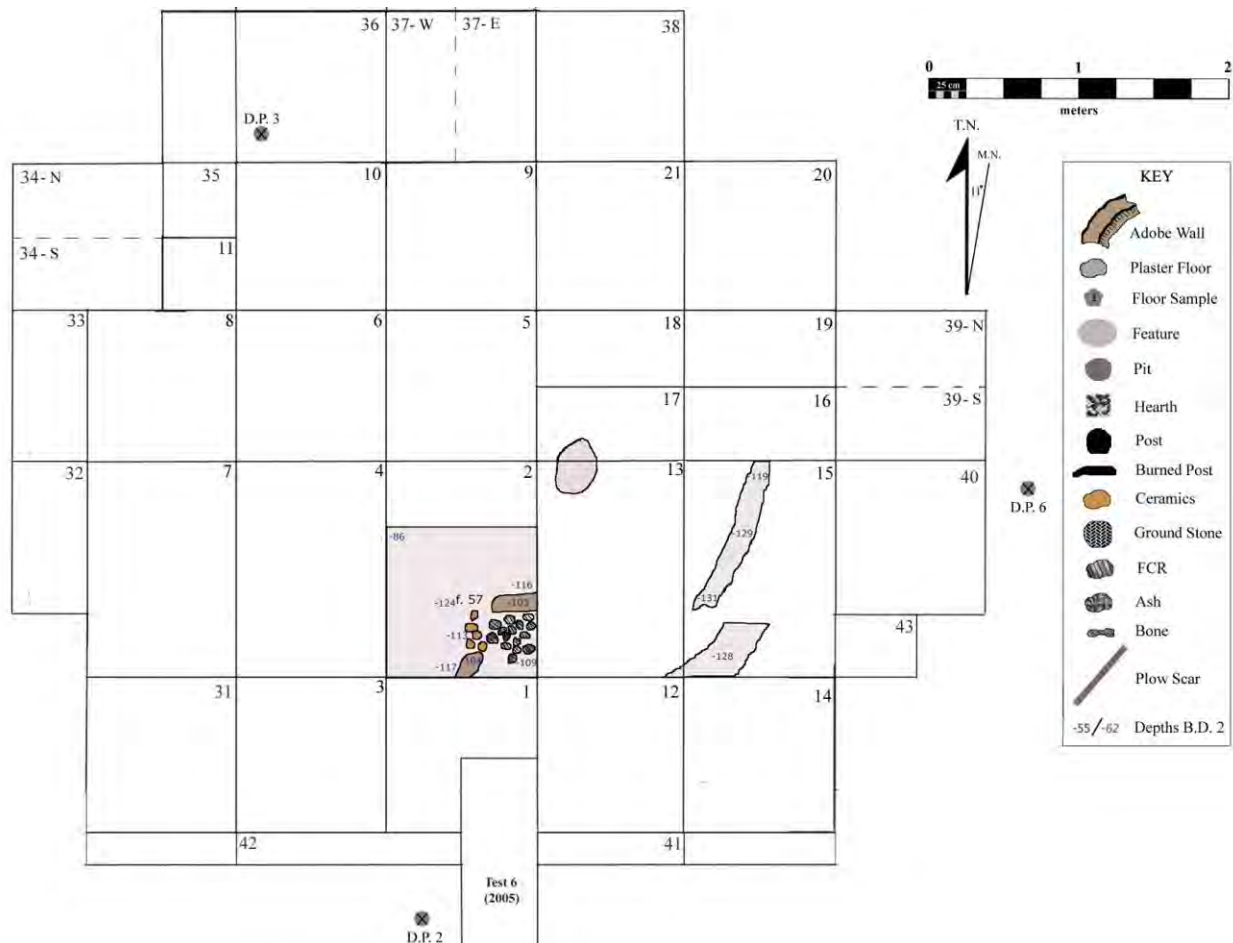


Figure 114. Level 9 excavations (shaded) and Feature 57 (the hearth).

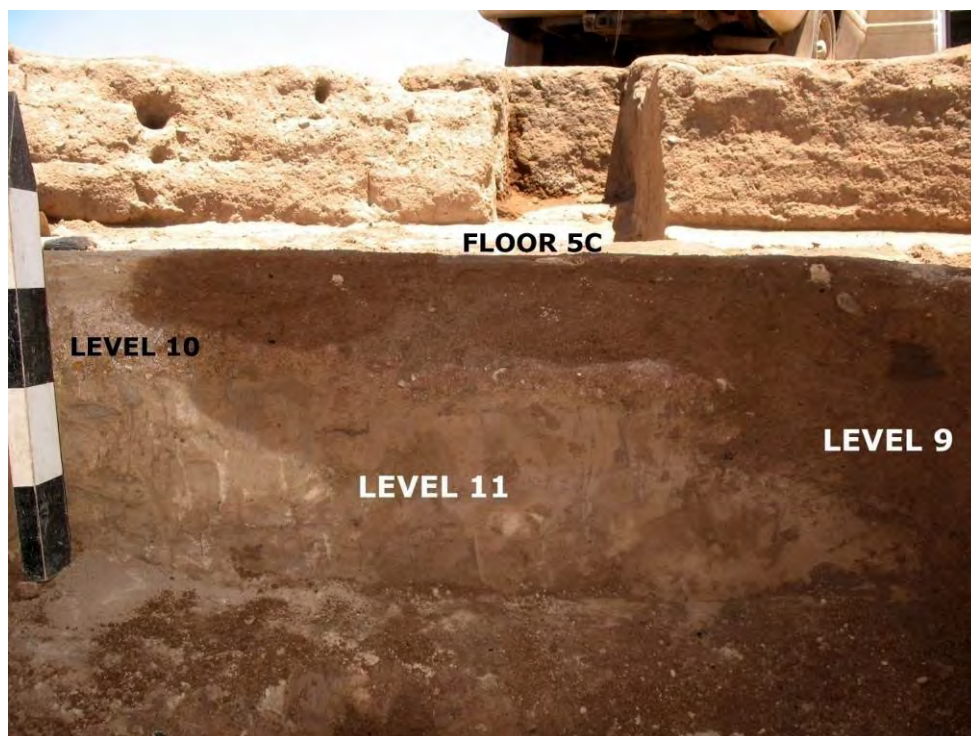


Figure 115. Unit 2-S, north profile.



Figure 116. Unit 2-S, south profile.

Feature 57 was a hearth partly exposed in the southeast corner of Unit 2-S. Minimum (observed) dimensions were 50 by 50 cm. The hearth was built on sterile clay (Level 11) at 120 cm BD, and was not associated with a plaster floor. Level 10 (fine gray gravel) was not present under the hearth. The west profile of Unit 2-S suggested that a depression was cut into the clay matrix to accommodate the feature.

The exposed portion of the hearth had an adobe rim, 10 cm tall, 15 cm wide, and 25 cm long. The rim was hardened and reddened by extended exposure to heat. Within the hearth, a large amount of charcoal, about 30 pieces of fire-cracked rock, ground stone, and pottery were found. A 15 cm thick lens with multiple layers of dark ash (mixed with charcoal and sherds) extended west, south, and east from the hearth to the respective profiles of Unit 2-S, and seemed to represent periodic cleaning of the hearth. The amount of heat alteration, the fire-cracked rock, and the multiple layers within the ash suggest that the hearth was used repeatedly.

A partly reconstructible olla came from the Level 9 hearth area (Lot 2985). This medium-sized jar was represented by 72 sherds, and another 13 sherds are probably from the same vessel—but no rim sherds were found. The jar was a polished dark brown ware with rosy patches that appear to be due to variation in the clay. Similar rosy patches on brown jars were observed in the 1999 collection from this site. A few of the sherds have a broad red band, and others appear to have black or burned out paint. Sherds from Lot 2985 with residues were sent to Dr. Mathew Boyd of the Department of Anthropology, Lakehead University. His analysis showed *Zea mays* starch as well as an unknown starch, on the interior of the pot. A radiocarbon date falling in the 600s to 700s (the earliest date from the site) is associated with this pottery (see Chapter 20).

Lot 2985 also included a scored sherd and a rim sherd from a black bowl (polished inside and out).

After use of the hearth ended, this part of the site was abandoned and numerous thin strata of fine silt and sand covered the hearth and ash lens (as seen in the west, south, and east profiles of Unit 2-S). As much as 30 cm of gradual sedimentation occurred during this period.

Features 14 and 15

Feature 14 was first identified in the 2005 GPR scan as an area of greater compactness north of Structure 5. We hoped that Feature 14 would be a storage pit associated with Structure 5, so in 2008 we extended the Feature 5 excavation area to include this feature (Figure 117). The work also allowed us to test the accuracy of GPR on targets smaller than pit houses. The area turned out to be a complex feature used repeatedly for cooking, resulting in multiple archaeological strata (A through D). Once we exposed the uppermost level (A) to define the size of the feature, a smaller trench was excavated in Unit 23 to sterile (the gray gravel defined as Level 10 at Structure 5), exposing the local stratigraphy. The strata were then excavated separately. In the process, Feature 15 was also defined (Figure 118). The datum for these features was placed northwest of Feature 14. Figures 119 and 120 illustrate various aspects of Feature 14's internal structure, and its relationship to Feature 15.



Figure 117. The 2008 northern extension of the Structure 5 excavation. Looking south toward Structure 5. The plaster surface designated “Floor 1” of Feature 14 is at the lower right, with the underlying hearth beginning to emerge below it and to the left. A small collections of rocks at the same level as the top of Feature 14 was designated Feature 15

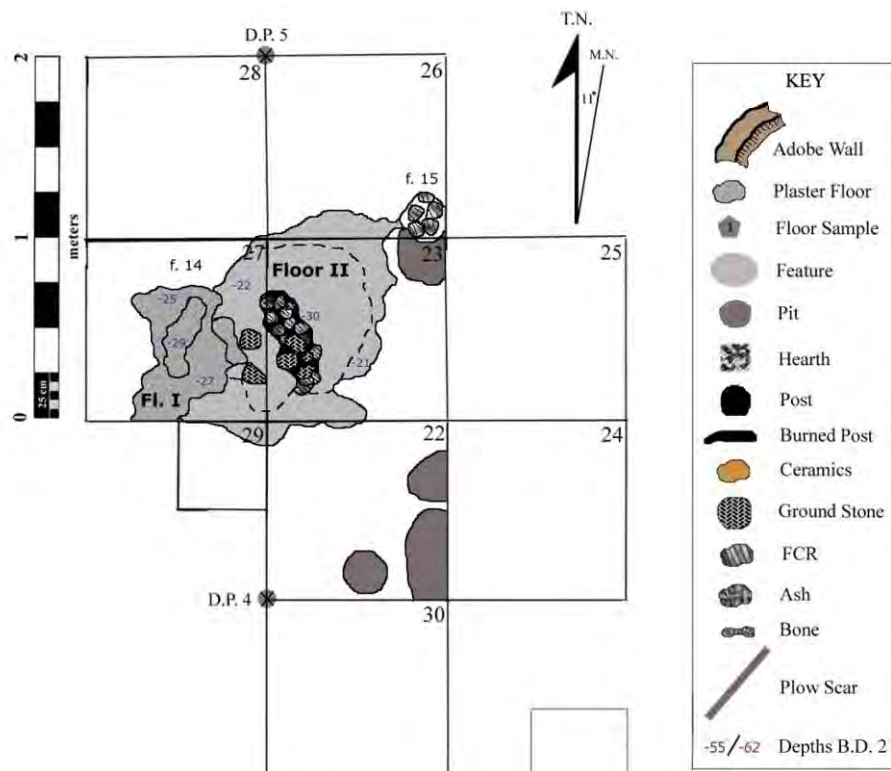


Figure 118. Plan of Features 14 and 15.



Figure 119. Profile views of Features 14 and 15. Top: west profile of Unit 23, showing the different levels and floors above the natural gray gravel (designated Level 10 in the Structure 5 excavations). Bottom: north profile of Unit 23, showing levels 10, D, and 2, Floor III, and Feature 15 .



Figure 120. Plan views of Feature 14, showing the successive exposure of the layers.

Level C, the earliest phase of activity, involved digging a circular pit into Level 10. The pit measured 50 cm in diameter and 15 cm deep (40 to 55 cm BD). As can be seen in Figure 117, the naturally gray gravel was thoroughly oxidized by heat from the cooking pit above. A “plaster floor” or compact surface (designated “Floor III”) was placed around this pit and its immediate area, directly on top of the natural gray gravel (37 to 40 cm BD). The “floor” was seen only in the four profiles of Unit 23, and we do not know its original extent. At least 37 small pieces of fire-cracked rock were found in the cooking pit, in dark ash and soil.

Level D represents the gradual elevation of the surface around the fire pit defined in Level C. The first addition was a uniform, 4 cm thick layer of compact brown-red adobe on top of “Floor III.” This was followed by two additional layers (each 5 cm thick) of lighter adobe melt. The

three new layers were separated by thin lenses of dark ash in the immediate area of the pit, suggesting that the feature was actively used during the formation of Level D.

The next round of activities was designated Level B. Once the top of Level D had risen to 25 cm BD, a new pit with a diameter of 60 cm was cut into that surface. The earlier pit was plastered over (“Floor I”) forming a bowl-shaped feature. We found at least 92 small pieces of fire-cracked rock in the new pit, in a mix of ash, charcoal, and light brown clay-like soil. When excavated, the area just to the north and east of the bowl-shaped feature was more compact than either the pit’s ashy fill or the Level D adobe melt. Although we first assumed this was an adobe enclosure around the cooking area (see Feature 57), its profile contained thin strata corresponding to the accumulation process labeled Level D. We concluded that the area was hardened by constant exposure to the heat from the pit.

Level A represents the last active use of the cooking area. Level A consisted of several complete and broken manos on top of smaller fire-cracked rock (at 21 to 33 cm BD). The ground stone pieces also showed signs of being exposed to fire. Finally, the fire pit was plastered over (“Floor II,” 22 cm BD). A thin layer of dark ash was present between “Floor I” and “Floor II” at the edge of the cooking pit. Curiously, the plaster only partly covered the ground stone of Level A, and these were sticking through the plaster when we first exposed the “floor.” “Floor II” was in or at the bottom of Level 2, the “adobe melt” that surrounded Structure 5 on all sides.

Four circular patches of darker fill were identified in the adobe melt in Units 22 and 23, so might have belonged to Level A. If so, the patches may represent holes for posts that surrounded the cooking area, perhaps to provide a windbreak or other limited shelter.

The plaster of “Floor II” occurred in a circular area 1.5m in diameter. Neither the 2005 GPR scan nor the adjacent excavations showed evidence of a structure in this area.

Feature 14 is best regarded as an external hearth that was remodeled several times and finally plastered over. It was probably was used by the occupants of Structures 5A and 5B. We have wondered why a hearth used and remodeled repeatedly was sealed by a plaster “floor.” The plaster could represent the closing of a ritually important feature, but it could also just be an attempt to seal in some rather dirty soil next to a structure.

In a small area on top of “Floor II” we found a 3 to 6 cm thick cultural deposit with ash. This cultural deposit was dubbed “Level 3”—not to be confused with the floor preparation material for Structure 5, Floor 5A. As the cooking pit had stopped functioning, “Level 3” may have been associated with the use of a different fire pit (one associated with Feature 15). Above this deposit was Level 2, compact, orange-brown adobe melt (7 to 20 cm BD). Level 1 was dark gray, loose plow zone material (7 cm below to 13 cm above Datum 2).

Test Trenches

In order to better understand the extramural stratigraphy at Structure 5, and to better define the construction sequence for the wall bases, three narrow test trenches were opened next to the wall of the structure. Two units (37 and 39) also served to connect the stratigraphic profiles of the northeast baulk to the external ones.

Units 34-N and 35

This was a 50 cm by 150 cm trench, limited to Unit 35 and the northern portion of Unit 34 (Figure 121).

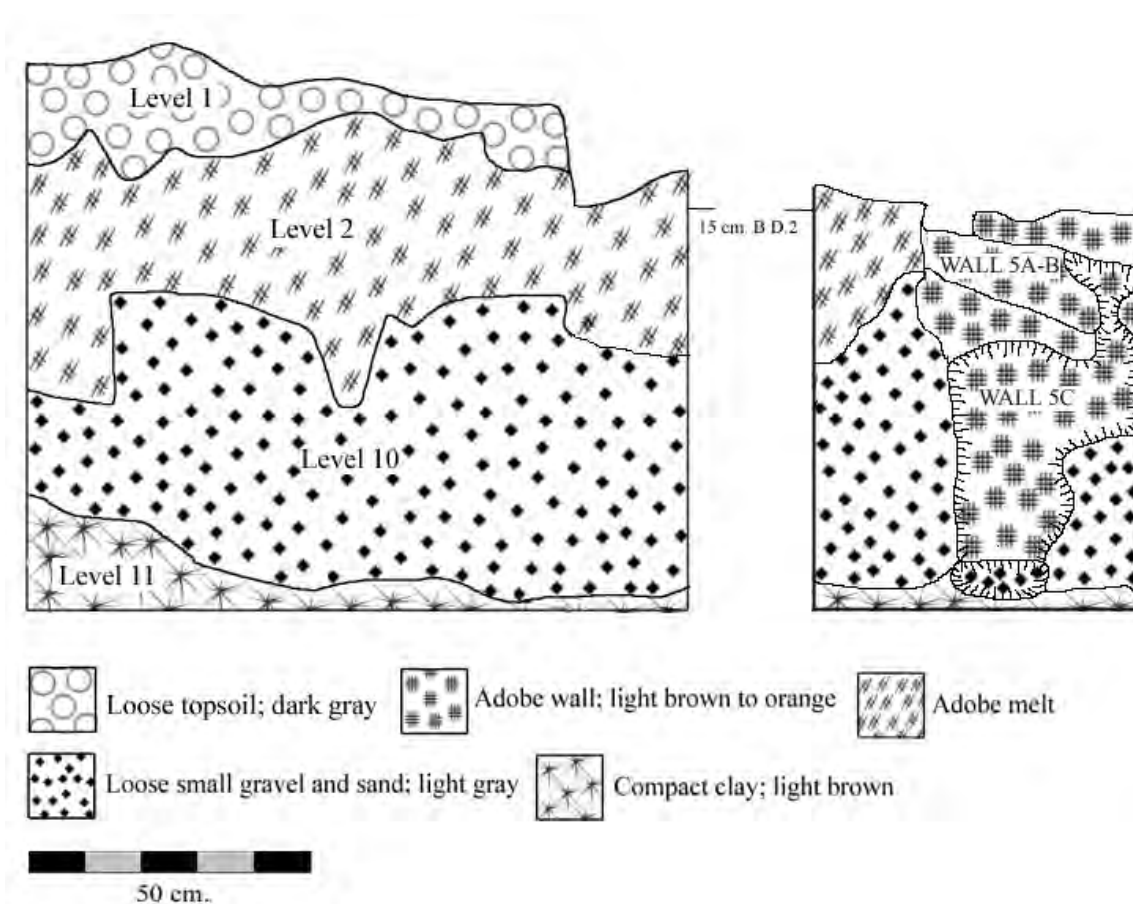


Figure 121. Profiles of Tests 34-N and 35. Left: north profile. Right: east profile.

The stratigraphy as observed on the south, west, and north profiles was quite straightforward. The sterile clay Level 11 (top at 82 cm BD) and the gray gravel Level 10 (top at 40 cm BD) were overlain by the adobe melt of Level 2 (top at 25 above datum) and the plow zone Level 1 (top at 45 above datum). The profiles suggest that no large construction or other extensive modifications

took place in this area during the occupation of Structure 5 (which is also suggested by the lack of GPR signatures in the area).

The east profile revealed the external face of the structure walls; Wall 5C is clearly seen under the later adobe courses of walls 5B. The walls about Level 10, confirming that this part of the structure was built against the perimeter of a pit dug into culturally sterile deposits.

Unit 37-E

This unit was a 50 by 100 cm trench, limited to the east side of Unit 37 (Figure 122).

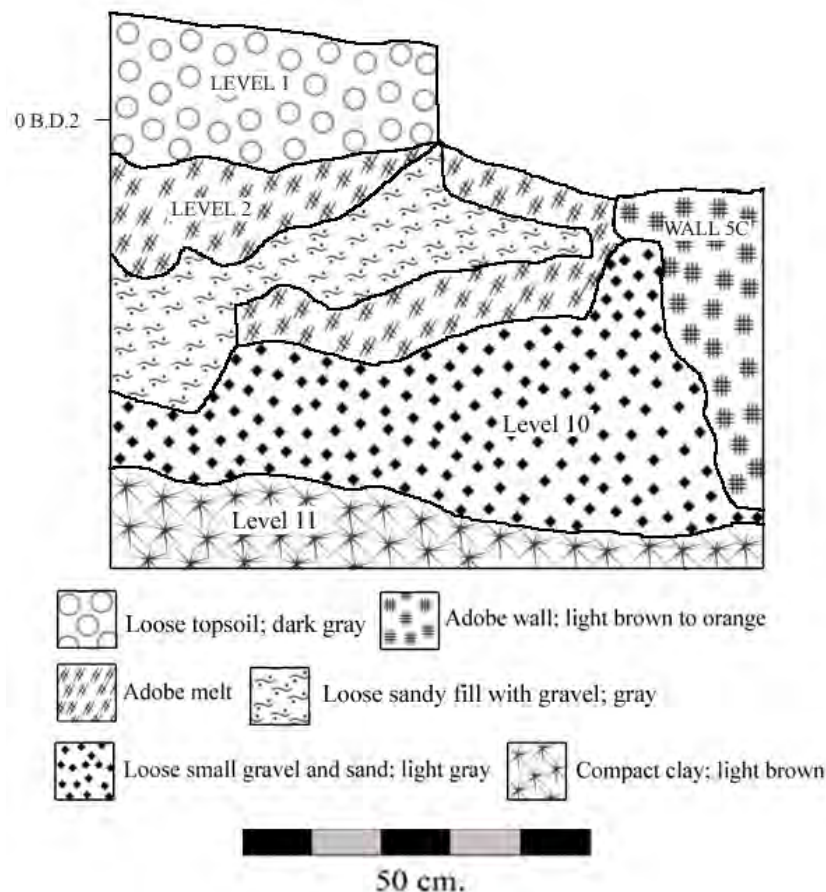


Figure 122. East profile of Unit 37-E.

In addition to recording the extramural stratigraphy in Unit 37-E, we dismantled the adobe walls (Figure 123) to connect the stratigraphy to the west profile of the baulk inside Structure 5.



Figure 123. Unit 37-E, before the adobe walls were dismantled.

The east profile of the test showed the usual sequence of Level 11 (top at 50 cm BD) overlain by Level 10 (top at 40 cm BD). Above these natural levels was a mix of adobe melt (Level 2) and gray sandy fill (top at 5 cm BD). This mix was also characteristic of Level 3 (the preparation layer for floor 5A), which was at roughly the same depth. This is, in turn, was overlain by the plow zone Level 1 (top at 15 cm above Datum 2). Wall 5C appears at the south end of the profile and, as was seen in Unit 35, it abutted the edge of a pit cut into sterile Level 11. This area also showed more mixing of the adobe melt and gray fill than did the northwest side of the structure. The GPR scan for the north of Structure 5 shows faint images that might be due to this mixing.

Unit 39-N

This 50 by 100 cm trench was limited to the north side of Unit 39 (Figure 124). In addition to recording the extramural stratigraphy, we dismantled the adobe wall to connect this unit to the south profile of the internal NE bulk. In contrast to the profiles in other tests, those of Unit 39-N showed a surprisingly complex stratigraphy. The northern profile showed the usual sequence of Level 11 (top at 55 cm BD) below Level 10 (top at 40 cm BD), but there was a partial removal of gravel and clay towards the east, resulting in a sharply sloped depression. The depression later filled with loose sandy silt (top at 90 cm BD), overlain by adobe melt mixed with charcoal (top at 45 cm BD) and loose gray fill (top at 35 cm BD). Two curved gray lines intersected these two last levels and may represent a root intrusion. The deposits were then covered by the adobe melt of Level 2 (top at 23 cm BD), with an angular piece of adobe visible in the profile. This deposit was, in turn, topped by the plow zone Level 1 (top at 3 cm BD). In the profile, Level 1 showed two distinguishable levels (loose over compact).

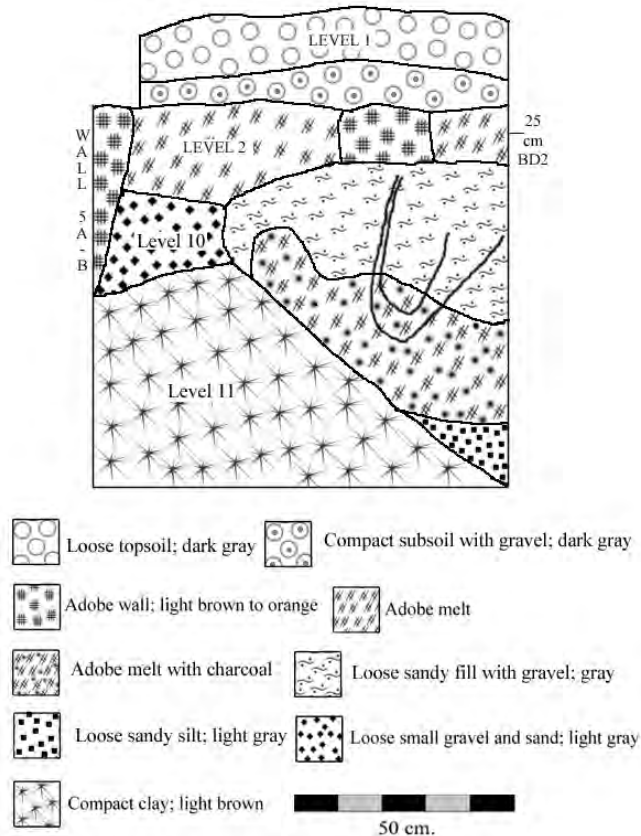


Figure 124. North profile of Unit 39-N.

The adobe wall of Structure 5 (5A, 5BI, and 5BII) was seen in the west half of the profile; here the wall was built directly on a ledge cut into clay (Level 11), and abutted both Level 11 and Level 10. The area showed the greatest amount of human modification seen around Structure 5; consistent with a GPR scan where a secondary anomaly is present northeast of the house.

Composite Profile

Figure 125 provides a composite profile extending both inside and outside Structure 5.

Structure 6: The “Twin” to Structure 5

In 2005, Test 5 was excavated to the plaster floor of a circular structure just south of Structure 5, and a small section of the curved wall or pit lining was exposed as part of the ground-truthing of the GPR survey of that year. The 2007 Tests 3 and 4, placed at right angles to 2005 Test 5, further exposed the wall/pit lining. The exposed wall/pit lining section conformed closely to what is seen on the 2005 GPR imagery.

Chapter 17

STRUCTURE 6 AND OTHER FIELDWORK, 2010

GPR images from 2005 indicated two pit structures that we called “twins” because of their proximity. In 2005, Test 5 was placed to cut the southern wall of Structure 5 and the northern wall of Structure 6, to confirm the existence of both. In 2007, two east-west trenches exposed more both structures. The northern structure of the two, Structure 5, was excavated in 2007 and 2008 (see Chapters 11–15). The 2010 work focused on exposing Structure 6 (Figures 126–129). At the beginning this work, fill from Test 5 and the southern 2007 trench were removed to ensure that the 2010 samples came from untested deposits. As excavation continued, it became apparent that the levels observed in the earlier tests did not continue across the entire structure, and level subdivisions were assigned—Level 2C, for example.

Between the 2008 field season and 2010, don Caterino Calderón and Sra. Alicia Calderón had sold the property to Sr. Luis García Castello. The earlier contour plowing, part of a “dry” (direct rainfall) farming strategy, was abandoned, and the new owner put in an irrigation well. The rows now extended east-west, with water flowing downhill from an irrigation ditch along the west edge of the field. The new owner also operated much larger tractors and the field was plowed more deeply. The combination of deeper plowing and downhill furrows accelerated soil erosion. The new owner graciously allowed us to build a protective berm upstream from Structure 6 and to continue our excavations, even though he had already started planting.

Structure 6: Excavation Levels

Above the House

Due to recent plowing, the upper 22 cm of soil BS was loose and fairly homogeneous, but with large sherds, other artifacts, and remnants of previous crops. This plow zone material, designated Level 1, was removed in 4 by 4 m units due to the disturbance. The fill was screened and the artifacts were collected.

Level 2 was the lower, more compact part of the plow zone, extending 50 cm below Level 1 and including the lowest part of the furrows of 2010. Since these furrows were only recently introduced into previously undisturbed strata, the strips of fill between the furrows retained their integrity. The entire level was excavated to 72 cm BS. Concentrations of artifacts within this level, such as Feature 1, were excavated and recorded separately.

Level 2C, a thin deposit, was found in the northeast quadrant of Structure 6. Later excavation suggested that Level 2C was part of Feature 1 within Structure 6 that had been disturbed by plowing.

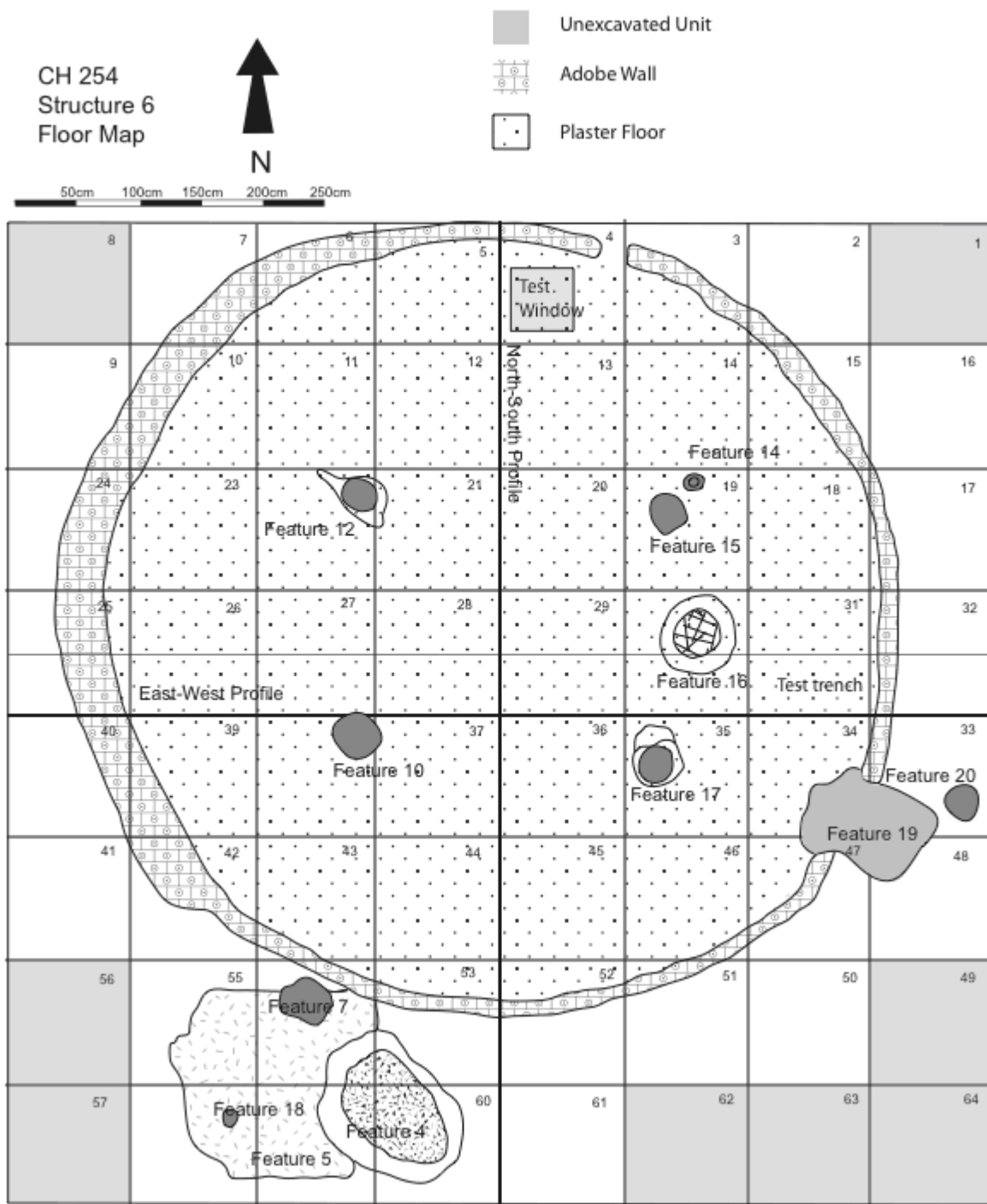


Figure 126. Plan of Structure 6. Prepared by Tanya Chiykowski.

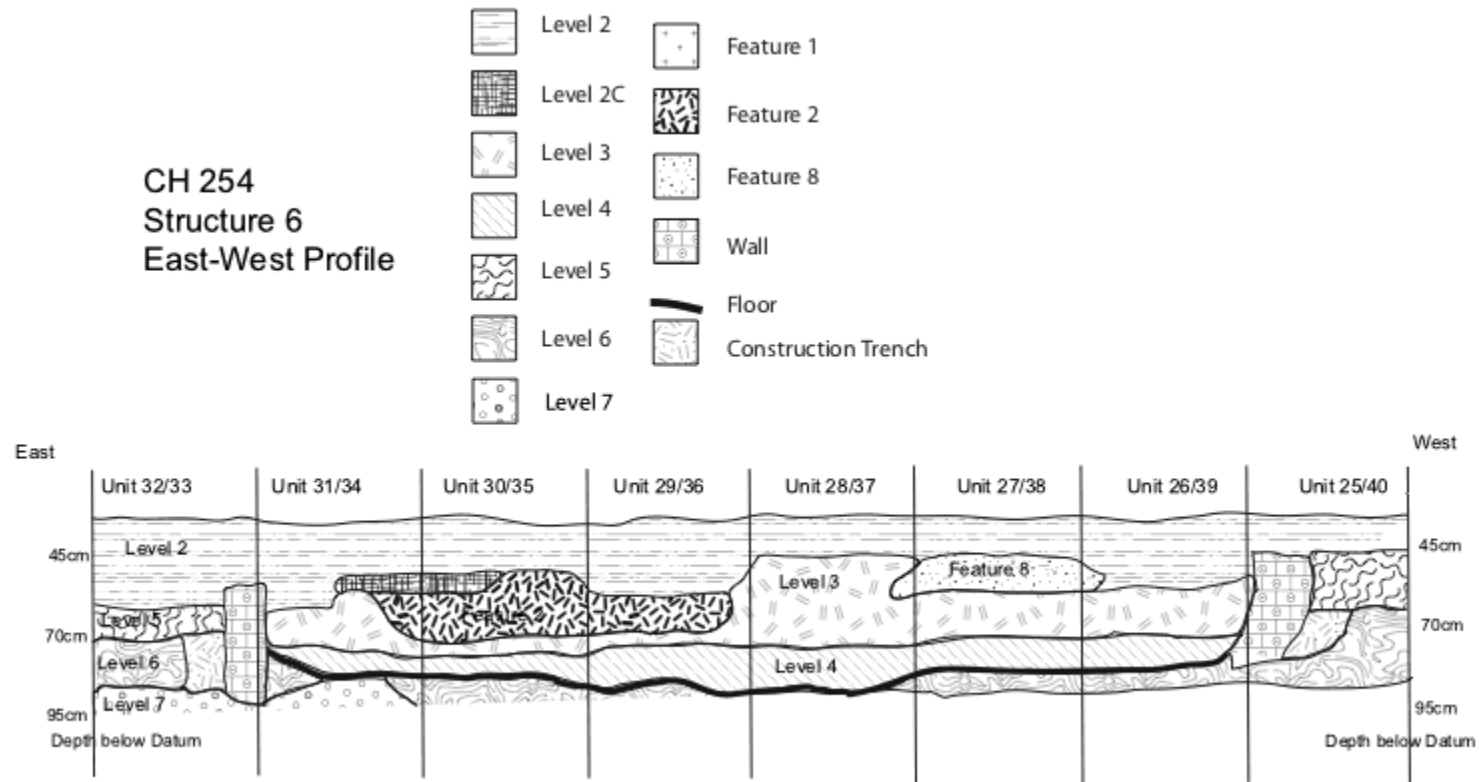


Figure 127. East-west profile of Structure 6. Prepared by Tanya Chiykowski.

CH 254
Structure 6
North-South Profile

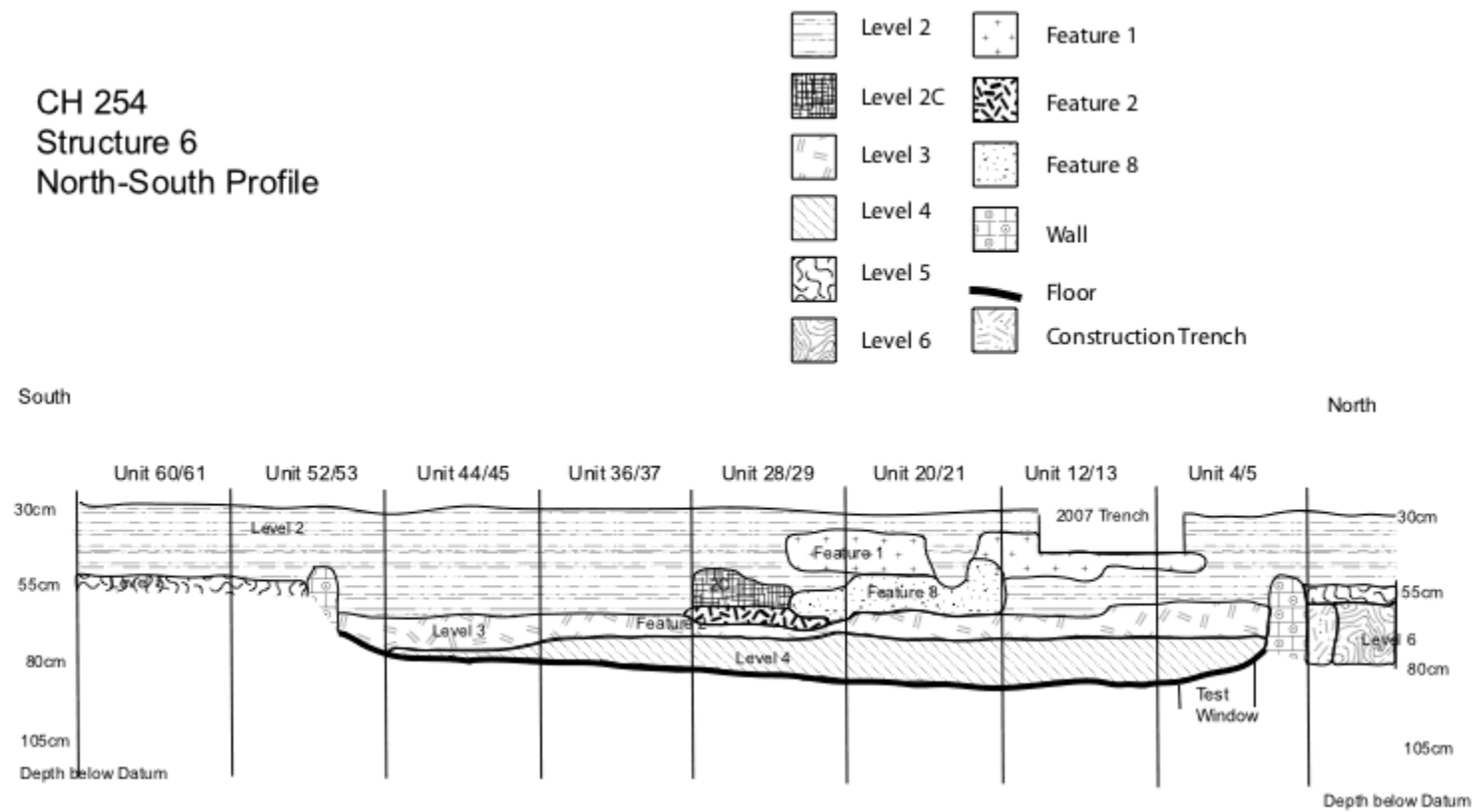


Figure 128. North-south Profile, Structure 6. Prepared by Tanya Chiykowski.



Figure 129. Structure 6 after excavation. View to west. The two fire pits and two east posts are shown in the lower half of the photo. The “test window” is to the right, and the two west posts are in the upper half of photo. The possible entrance is at the lower left. The photo was taken before the excavation of the two east posts.

Within the House

A hard level was clearly visible in the southeast corner of Structure 6. Excavation revealed stained patches within a clay-rich area. Level 2D was interpreted as remains of the house wall and roof. Artifacts were scarce and small. A large rodent burrow extended to the floor of Structure 6 in Unit 46.

Level 3 covered the entire floor and was a continuation of the structural fill seen first in Level 2D. A major rodent burrow, Feature 15, extended to the floor of Structure 6 and yielded modern seeds and cloth within Unit 19. The northeast roof support post, directly underlying this disturbance, was also identified as Feature 15. Level 3 contained the largest number of artifacts, mixed with *bajareque* and other structural remains.

Level 4 extended to the house floor at depths of 76 to 86 cm BD (below datum). Artifacts were sparse in Level 4 and there was no floor assemblage; it appeared that the house had been cleaned out prior to abandonment.

Outside the House

Found outside of the adobe walls of Structure 6, Level 5 underlay the upper fill recorded as Level 2. Level 5 was below the plow zone. Features 19 and 20 were located within this level.

No cultural remains were recovered from Level 6, a layer of gray gravel found between 71 and 82 cm BD.

Reaching a depth of 142 cm BD, Level 7 consisted of sterile clay with cobbles.

Features

The features defined at Structure 6 included artifact concentrations, floor features, and external features. Two additional features, 11 and 13, proved to be rodent holes.

Postdating the House

Feature 1 was a concentration of artifacts in a 4 by 3 m area in the north and northwest portions of Structure 6. The artifacts had been disturbed and dragged by plow action. Within Feature 1, the upper 10 cm was designated Level A and the lower 15 cm was designated Level B. In this same area, a shallow east-west trench dug in 2008 had exposed a horizontal surface on which several large sherds were found. In 2010, more large sherds were found, mixed with large pieces of burned and unburned *bajareque*, manos, a hard sedimentary rock, and three projectile points. Soil from the feature was collected and fine-screened in the lab, yielding retouch flakes whose materials visually matched those of the three projectile points. Feature 1 most likely represents an exterior work area or primary trash deposit associated with one of the later versions of Structure 5.

Feature 2, a shallow pit within Level 2C, was disturbed by plow action and extensive rodent activity. The feature included an abundance of fire-cracked rock and ash and may have been an exterior hearth into which trash was thrown. Burned *bajareque*, sherds and a variety of stone artifacts were found, leading the excavator to assume that the trash pit represented multiple deposition episodes.

Feature 8/9 represents a concentration of *bajareque* (in many cases measuring more than 15 cm across, and showing various degrees of burning). The pieces of *bajareque* included holes and casts of the original wattle—evidence of a perishable superstructure above the adobe wall bases (Figure 130). The feature also yielded several sherds of a scored vessel.



Figure 130. *Bajareque* from Structure 6, showing voids and casts.

Features 3 and 6, two concentrations of dark sediment containing ash and fire-cracked rock, were also found. Feature 3, outside the horizontal limits of Structure 6, was well within the plow zone and disturbed; it seemed to be a small exterior hearth in a pit. It was small, measuring 27 cm across and 14 cm deep. Feature 6 was found in the fill of Structure 6, in Level 5. Ashes, fire-cracked rock, and a small mano were concentrated in an area roughly 20 by 15 cm across and 15 cm deep. This did seem to be a hearth, not as there was no discoloration of the adjacent soil, but material dumped during cleaning of a nearby hearth.

Structural Elements

Feature 10 was the post hole for the southwest roof support post in Structure 6 (Figure 131). The hole measured 36 cm east-west and 31 cm north-south, and extended 67 cm below the floor. The top 15 cm of the post hole extended 15 cm through the hard-packed fill immediately below the floor. From 15 to 60 cm below the floor the post hole extended through Level 6, and had a diameter of 20 cm at the base of that level. The bottom of the post hole was in Level 7. The post hole fill was dark, due to organic staining, and a few sherds and a bone. A large sherd covered the posthole at floor level.

Feature 12, the post hole for the northwest roof support post, resembled Feature 10 in terms of size and depth, also reaching 67 cm below the floor. This post also extended through the subfloor fill and Level 6, ending in Level 7. Unlike Feature 10, Feature 12 included an irregular, oblong collar (oriented northwest-southeast), with the post hole measuring 30 cm in diameter within the collar. The post hole fill included small sherds and animal bones.

A major rodent burrow, Feature 15, extended to the floor of Structure 6 and produced modern seeds and cloth within Unit 19. The post hole for the northeast roof support post was located underneath the rodent burrow, and was badly disturbed at floor level (along with the adjacent floor). Modern materials continued into the upper few centimeters of the post hole. Despite the disturbance, it was apparent that the original dimensions of this post were comparable to those of Features 10 and 12; like those two features, Feature 15 ended in Level 7, 67 cm below the floor. A piece of fire-cracked rock was found in Feature 15, 15 cm below floor level.

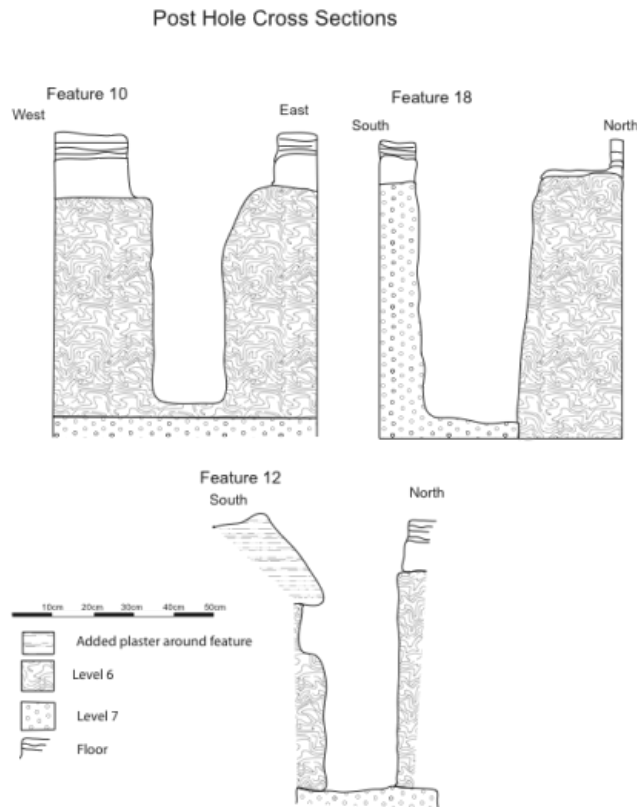


Figure 131. Profiles of major support post holes in Structure 6.
Prepared by Tanya Chiykowski.

A post hole for a secondary support post, Feature 14, was found 10 cm northeast of Feature 15. Feature 14 measured 18 cm in diameter and extended 17 cm below the floor. It yielded a fragment of wood (not charred) that measured 10 cm in diameter and 15 cm long.

Feature 17, the post hole for the southeast roof support post, was also comparable in size and depth to the two western post holes (Features 10 and 12).

Feature 16, a basin-shaped hearth, was placed in the east half of the structure, just east of the line between the two eastern posts (Figure 132). The hearth had a diameter of 32 cm and a maximum depth of 15 cm. The upper edge of the hearth rose 2 to 3 cm above the floor. Although the basin was thoroughly burned, it was cleaned out prior to or during structure abandonment.

The hearth was sectioned, revealing two lower hearths associated with earlier floors (Figure 133). The lower hearths were simple clay-lined basins; the upper had a diameter of 70 cm and the lower one had a diameter of 90 cm. The lower hearths were not fully excavated so their depths are unknown.



Figure 132. Feature 16 (hearth) in Structure 6.



Figure 133. Cut through Feature 16, exposing earlier hearths.

Features 19 and 20 were taken as evidence of a lateral entry in the southeast wall of Structure 6. At Feature 19, a break in the adobe wall base corresponded to a section of missing floor and a roughly rectangular stained area extending across the line of the wall (Figure 134). The stained area measured 65 cm across. Feature 20 was a post hole northeast of Feature 19; the post hole measured 32 cm in diameter and extended 23 cm below the top of Feature 19. The very dark posthole fill included large and small animal bones.



Figure 134. Feature 19 at Structure 6: side entry or late pit?

The crew interpreted these two features as the remains of a gradual ramp from the outside living surface to the floor of the pit (in contrast with Structure 5 and its adobe entry step). The nearby exterior features led further credence to this hypothesis. Nonetheless, the fact that Feature 19 stain extended below the Structure 6 floor bears attention. An alternative interpretation of Feature 19 is that it was a pit cut into the house wall and floor after the house was abandoned.

Outside the House

At least four features were present south-southwest of Structure 6 (Figure 135). The largest was Feature 5, an irregular patch of floor plaster thought to indicate an outside activity area. The plaster formed a shallow depression in which no artifacts were found. The plastered surface bore east-west plow marks, from earlier plowing of the site, and so it is surprising that Feature 5 survived at all. A layer of sand covered the plastered area.

Feature 4 was an exterior plaster-lined pit at the east edge of Feature 5, and postdated that feature. Feature 4 was full of ashy sand, and charred maize was found inside the pit. This feature showed no reddening, suggesting that it was not a hearth.



Figure 135. The group of features outside Structure 6. Note the curving wall base of the house, in the upper left part of the photo.

Feature 7 is a burial of a puppy or small dog (the second dog burial found by the PAC; the other was at Ch-240 in the Santa Clara valley). Although bones and teeth had been dragged by plow action into Units 51–53, enough of the burial was in place to suggest that the dog was buried on its right side (probably during the occupation of Structure 6).

Feature 18 was a hole some 20 cm in diameter and 17 cm deep in the plaster of Feature 4.

Construction of Structure 6

Construction of the house began with the excavation of a large pit. The side walls of the pit sloped and the pit bottom was not entirely level. A circular trench was excavated 10 to 20 cm inside the pit wall, and served as the bottom of the adobe wall base. Subfloor material was laid to create a somewhat dish-shaped floor (that extended roughly 65 to 83 cm BD). The estimated floor area within the adobe wall base was 30.1 m².

The adobe wall base varied in width from 10 to 40 cm. The original height of the adobe wall base is unknown; *jacal* construction above the wall base is inferred.

Post remnants and other pieces of wood indicate that the four main posts and other major structural elements were pine, while three pieces of madrone or manzanilla were probably used for *jacal* wall or roof construction.

Floor construction was observed in a 50 by 50 cm test in Unit 4 (in the northern part of the structure), in a 50 cm wide east-west trench through the house (to expose the subfloor strata for profiling), and in the post holes. At least four separate floors were observed (Figure 136), three of them associated with the superimposed hearths. These floors represented remodeling of a single structure, rather than sequential structures. The floors were separated by 1 to 2 mm thick deposits of sandy soil. The layers of floor plaster were visible in all of the subfloor exposures except at Feature 19, the possible entrance. Each floor maintained a 90 cm long north-south ridge, west of the hearths, that was reminiscent of the proposed “deflector” seen in Structure 4.



Figure 136. Structure 6 floor, showing multiple layers of plaster

Floor plaster was continuous with the wall plaster on the adobe wall base (Figure 137).

Structure 6 was not burned during its occupation. The hearths and floors were carefully cleaned, suggesting that remodeling and abandonment of the house was deliberate. It is possible that the main posts were removed during house abandonment, given the breakage of plaster around the Feature 17 post hole. The superstructure was allowed to collapse into the pit.



Figure 137. Cut through the wall of Structure 6, showing the wall-floor juncture.

Other Fieldwork in 2010

Tests

The GPR images of 2005 included five large circles, each about 12 m in diameter and 1 m below the surface, in the northern part of the site. Two explanations seemed likely: these were natural features or, less likely, they were large, early domestic structures. In the latter case, a shift in the size and function of Viejo period houses would need to be explored. Two 1 by 1 m units were placed within one of the large circles. We could not excavate planted areas, so the two units were placed in an unplowed area along the road around the North arroyo. The stratigraphy of the two tests closely resembled that found in the north wall of the North arroyo. No features were found in the tests. We concluded that the large circles seen in the GPR imagery, at a depth of 1 m, were natural.

Surface Collections

We had made surface collections in previous years, and did not intend to do so in 2010. Sr. Calderón dry-farmed the field, and left it fallow between 2005 and 2008 due to lack of precipitation. With the change in ownership, the field was converted to well irrigation, deeper plowing, and a change in crop row direction, resulting in new surface concentrations of artifacts including human bones and large sherds. It appeared that the deeper plowing had cut into previously undisturbed houses, some of them outside the GPR grid. A series of 20 by 20 m units was established over the western part of the site (the area in which we were permitted to walk), including areas beyond the limits of the GPR grid (Figure 138). Crew members walked these units at 1 m intervals and collected surface remains.

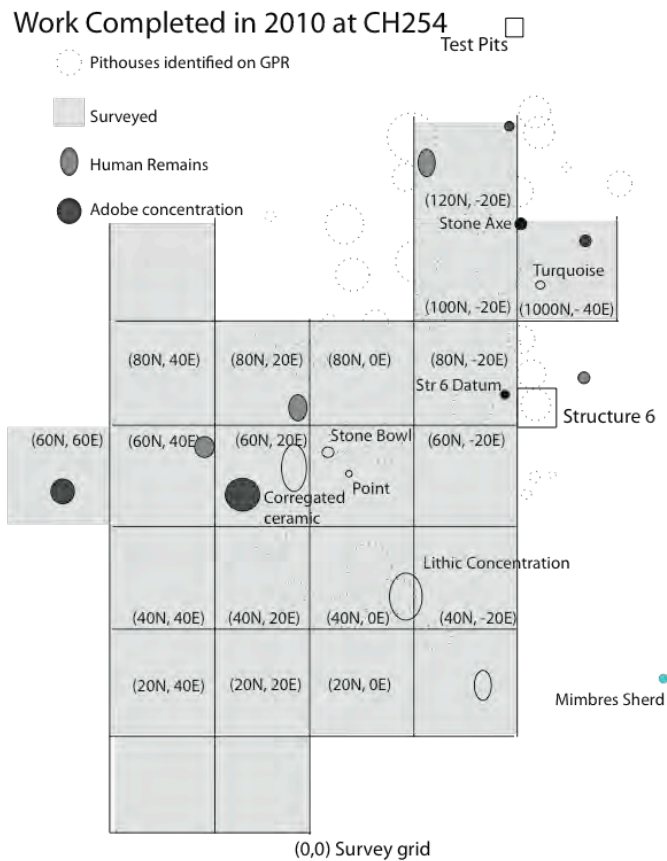


Figure 138. The area surface collected in 2010.

Collecting was limited to large sherds and rims, cores other flaked stone other debitage, and human bones were collected. Most ground stone was photographed but not collected (at INAH's direction, in response to the amount of ground stone in our previous collections). The exception was a stone bowl from N60-0E, which was collected and exported for residue analysis (Appendix A).

Chapter 18

ARTIFACTS FROM THE 2010 FIELD SEASON

Pottery

The sherds from 2010 fit well with those recovered in previous field seasons. The sherds derived from three discrete sets of collections. The first was the surface collections from grid units (Table 32). More than 4000 sherds were collected from these units.

Table 32. Surface Collection Lots, 2010.

Lot No.	Grid unit
4200	N80E0
4201	N60E20
4202	N60E0
4203	N80E20
4204	N40E20
4206	N20E20
4207	N0E20
4208	N40E0
4209	N60E20
4210	N80E-20
4211	N20E-20
4212	N40E20
4213	N20E0
4214.1	N120E20
4214.2	N120E20
4215	N100E20
4218.1	N100E-40
4218.2	N100E-40
4218.3	N100E-40
4218.4	N100E-40

The second set of collections, and the largest (more than 10,000 sherds), came from the excavation of Structure 6. The sherds from the Structure 6 excavations support the inference that Structure 6 was occupied fairly early in the history of the site (probably before A.D. 900). In this overview of the pottery, some levels are combined on the basis of stratigraphic relationships. In this chapter, Level 2 combines the variations in Level 2 recognized at the time of excavation. Level 2F combines the sherds from the deposits within Level 2 that were given individual feature numbers. Level 4 represents the structural debris in the Structure 6 pit.

Very few sherds were found on or immediately above the floor of Structure 6 (i.e., in Level 5). A few more sherds were recovered from the units combined into Level 4. Most of the sherds came Levels 2 and 2F, that is, from the surfaces and features that we think were associated with the middle and upper structures in the adjacent Structure 5 (Floors A, B1 and B2). The exception is Feature 4, which produced only 11 sherds (10 undecorated and one polished black) and which yielded a radiocarbon date confirming its association with the Structure 6 occupation.

The third set of collections come from two test pits dug in order to evaluate large circles seen at a depth of 1 m in GPR imagery.

Tables 33 through 35 summarize the sherds recovered in 2010. The project adopted a descriptive approach to ceramic categories. The assemblage reflects a brownware tradition in potters were free to shape and decorate their vessels various ways (as is the case with all of the local Viejo period assemblages).

Table 33. Numbers and Weights of Body and Rim Sherds, 2010.

	Body Sherds (count)	Rim Sherds (count)	All Sherds (count)	Body Sherds (weight, Grams)	Rim Sherds (weight, Grams)	All Sherds (weight, Grams)
Surface Collection	3865	223	4088	56749	1891	60180
Str. 6, Level 1	187	13	200	1856	164	2020
Str. 6, Level 2	6045	252	6297	31130	1799	33628
Str. 6, Level 2F	2731	178	2909	27509	3013	30120
Str. 6, Level 3	1101	74	1075	7443	1012	9530
Str. 6, Level 4	141	9	150	749	78	827
Str. 6, Level 5	51	1	51	295	2	297
Total, Structure 6	10256	527	10783	68984	6068	75052
Test 1, Level 1	59	5	64	66.5	16	83
Test 1, Level 2	28	8	128	708	27	735
Test 2, Level 2	92	6	98	547	20	567
Test 2, Level 3	43	1	44	261	11	272
Test 2, Level 4	21	0	21	69	0	69
Total, Tests 1 and 2	243	20	263	1105	74	1179
Grand Total	14364	770	15134	126837	8023	134860

Table 34. Categories of Body Sherds, 2010.

	Plain	Black	Red-slipped	Red-on-brown	Textured	Santa Ana Poly-chrome	Mimbres Black-on-white	Combos and Others	Total	Weight (grams)
Surface	2508	172	276	291	445	114	1	58	3865	60180
Str. 6, Level 1	107	17	16	9	33	4	0	1	187	1856
Str. 6, Level 2	4048	400	334	345	748	68	0	102	6045	31130
Str. 6, Level 2F	1582	290	135	148	515	17	2	42	2731	27509
Str. 6, Level 3	749	91	48	61	135	3	0	14	1101	74434
Str. 6, Lev. 4	111	11	2	5	11	1	0	0	141	740
Str. 6, Lev. 5	42	3	3	1	1	0	0	1	51	296
Total, Str. 6	6639	812	538	569	1443	93	2	160	10256	68984
Test 1, Level 1	43	5	0	2	8	0	0	1	59	67
Test 1, Level 2	20	2	3	2	1	0	0	0	28	161
Test 2, Level 2	61	0	2	7	22	0	0	0	92	547
Test 2, Level 3	30	7	1	1	4	0	0	0	43	261
Test 2, Level 4	14	0	0	2	4	1	0	0	21	70
Total, T1 & T2	168	14	6	14	39	1	0	1	243	1105
Grand Total	9145	968	815	827	1884	208	3	219	14364	126836

Table 35. Categories of Rim Sherds, 2010.

	Plain	Black	Red-slipped	Red Rim	Red-on-brown	Textured	Poly-chrome	Combos and Others	Total
Surface	54	10	37	48	10	31	4	29	223
Structure 6, Level 1	3	0	2	2	0	4	0	2	13
Structure 6, Level 2	110	14	37	39	6	38	0	8	252
Structure 6, Level 2F	76	16	11	17	4	43	0	11	178
Structure 6, Level 3	29	10	6	13	1	12	0	3	74
Structure 6, Level 4	4	2	0	0	0	3	0	0	9
Structure 6, Level 5	0	1	0	0	0	0	0	0	1
Total, Structure 6	222	43	56	71	11	100	0	24	527
Test 1, Level 1	1					2		2	5
Test 1, Level 2	3	3				1	1		8
Test 2, Level 2	3	1				1	1		6
Test 2, Level 3						1			1
Test 2, Level 4									0
Total, Tests 1 and 2	7	4				5	2	2	20
Grand Total	283	57	93	119	21	136	6	55	770

Obvious imports are limited to three sherds of Mimbres Black-on-white—a far different situation than that reported by Di Peso et al. (1974) for the Convento and Los Reyes 1 and 2 sites in the northern zone. Less obviously, vessels were sometimes exchanged among Viejo period communities of the southern zone. Fralick and Stewart's (1999) preliminary compositional analysis found that visual attributes alone were insufficient to distinguish non-local sherds from local sherds, however, an X-Ray diffraction study now being conducted at the University of Alberta indicates that a few of the plain sherds did, in fact, come from outside the local area. The same study supports our earlier inferences that most of the pottery recovered by the project was locally made.

Plain

Plain (or Undecorated), the most numerous category of body sherd, includes sherds ranging from tan to deep brown to red-orange, with additional variability due to firing clouds and blackening from usage. Completely plain vessels occurred as both bowls and jars. Undecorated sherds from the lower parts decorated vessels were also placed in this category, as might be inferred from a comparison of Tables 34 and 35.

Black

Although the Black category overlaps with Plain (Undecorated), the assemblage includes definite polished black sherds. This treatment was applied to the interiors of bowls, to the exteriors of bowls and jars, or to both surfaces. If enough of the vessel is present, the color can grade from brown to black even on thoroughly polished vessels. (This can also be the case for the better-known Medio period Ramos black from the northern zone.) Most of these sherds are assumed to be local and to represent a variant on the local brownware tradition. However, some sherds are so hard and well-polished that they may be imports. Black vessels appear to be earlier, and more numerous during the Viejo period, than in the northern zone.

Red-slipped

Red slips (Figure 139) were most commonly applied to jar exteriors and bowl interiors, but could occur on both surfaces. It is not clear to what extent entire vessels were red-slipped; perhaps some jars were slipped on the shoulders and had plain brown bases. Red-slipped vessels, like polished black ones, appears to be earlier and more numerous in southern zone Viejo period sites than in those of the northern zone of the culture area.

Vessel supports are rare in the culture area, but a few are known from Paquimé. The PAC recovered a vessel from El Zurdo that had attachment scars from four round feet (Kelley 2009). That vessel was found in an arroyo bed and could not be dated, however. The sherd in Figure 139 is the first vessel support reported for the upper Santa María drainage, and though it cannot be precisely dated, it is from a Viejo period context. It was recovered from the plow zone between Structures 5 and 6, which suggests that it is late Viejo.



Figure 139. Red-slipped sherds. The left three sherds are from jars. The right sherd is the vessel foot fragment from Lot 4356.

Red Rim

Red lips occur on otherwise undecorated vessels (insofar as one can tell from rim sherds alone), and on textured necks. A red lip on a black vessel is occasionally seen, as are red-lipped polychromes. Red on the rims of vessels, and especially on their lips, was an important local design approach.

Red-on-brown

The hallmark of the Viejo period, red-on-brown vessels were produced locally and do often do not fall neatly into the types defined for the northern zone. When the local sherds do closely fit northern zone types, we cannot tell whether they were imported from the north or carefully reproduced locally.

In the lab, very finely lined red-on-browns were recorded as Mata Red-on-brown. Sherds with a bright red-orange, often smeared paint, with polishing over the paint, was classed as Anchondo Red-on-brown. Sherds with such well-defined design attributes are consistently outnumbered by more generic red-on-browns. These obviously local red-on-browns tend to have red lines of medium width, and some have wide lines and blocks of red paint. The red paint can vary from bright red-orange to dark red and even brown. Triangles, nested lines, and branching lines are usually found pendant to horizontal lines. The rare red dots can be placed between framing lines or in patterns across the pot. Paint was usually applied directly to an unslipped surface. Slipped backgrounds do occur, but rarely; it is unclear whether they belong to the local red-on-brown tradition or should be separated in future studies.

Textured

In descending order of popularity, major surface treatments can be classed as corrugated, incised, corrugated, incised, and scored. Minor texturing techniques include appliqué and the use of bosses. The texturing exhibits a certain exuberance, and a single vessel could display combinations of surface treatments. Some jars may have been textured all over, but the vast majority were textured on the shoulder and the lower part of the vessel was left plain. A few sherds are from bowls with exterior corrugations.

Polychrome

Most of the polychromes recovered in southern zone Viejo period sites are classified as Santa Ana Polychrome, but many sherds do not fit easily into that type. Santa Ana Polychrome is part of the local brownware tradition, and a forerunner of Babícora Polychrome. Medium-width to thin lines of alternating red and black, usually on a tan or light brown background, can encircle the vessel, can duplicate the chevron and branching designs seen on red-on-brown and textured sherds, or can be extend vertically or at an angle from a horizontal line. Larger areas of red and black also occur. The background colors range from light tan to dark brown.

The red paint found on polychrome sherds ranges from red-orange to dark red, and at times is thinly applied or rather faded. The nominal black paint often fires out gray or burns out altogether. Some of the Santa Ana Polychrome sherds show designs virtually identical to those on some red-on-brown sherds.

Some of the polychrome sherds are not Santa Ana Polychrome, but do not fit any other defined types. They appear to be locally produced. Some indicate steps towards the Babícora style repertoire, but others are idiosyncratic.

Combination/Other

In the southern zone we have consistently found combinations of techniques and unusual design approaches, which we termed Combos and Other. A corrugated vessel with red paint over the corrugations was placed in the Combo category, for example, along with a description. Examples of Other design approaches include black-on-brown, black-on-red, and red-on-black. The mix and match approach never accounts for a large percentage of assemblages, but the sherds are eye-catching.

The most important of these sherds may be the ones with soft white paste. Those sherds are most often undecorated, but some are corrugated or have red paint. They also occur in a different Viejo period site of the upper Santa María drainage, Ch-218, and could be from a specific production locale.

The 2010 ceramic assemblage includes a few sherds of black polychrome, of the same type as the reconstructed vessel recovered from Structure 5, Floor A in 2008.

Vessel Forms

The predominant forms are hemispherical bowls (Figure 140) and jars. Because the 2010 sherd sample is weighted so heavily in favor of the site surface and upper excavation levels, we hesitate to describe trends in vessel form through time. However, jar rims do outnumber bowl rims in the lowest levels of Structure 6, so perhaps there was a trend from jars to bowls. Minor forms include incurving bowls or *tecomates*, and, rarely, vessels with highly everted walls that could be classed as plates or shallow bowls.



Figure 140. Two rims from a deep, plain hemispherical bowl.
Lot 4355, Unit 1, Level 2B.

Only one or two pieces in the 2010 assemblage from Ch-254 appeared to be part of appendages or figurines. Jar handles were also rare. Three were tabulated; two were braided forms attached at the rim and shoulder of a vessel.

Estimated Rim Sizes

Based on rim sherds, two-thirds of vessel rims were estimated to have diameters between 16 and 25 cm (Table 36). One in ten vessels had smaller-diameter rims, and a roughly equal number had larger-diameter rims. Excluding miniatures, the smallest estimated rim diameters were under 10 cm, while the largest exceeded 31 cm. We infer that most vessels were of modest size, but that larger jars and bowls were available for storage and serving.

Modified Sherds

A few drilled and shaped sherds were recovered (Figure 141). One sherd had a bevelled edge used for scraping.

Ground Stone

Twenty-one ground stone artifacts (or fragments of such artifacts) were recovered in 2010. Items from the site surface included six axes/mauls, a grooved maul, six stone balls, and five stone bowls. Two of the axes were full-grooved and four were 3/4 grooved. One of the 3/4 grooved specimens had a double groove. Four were complete, one was broken behind the groove, and one was a midsection. A grooved maul or hammerstone was also collected from the surface.

Table 36. Vessel Forms and Rim Diameters, as Estimated from Rims, 2010.

	Vessel Form				Rim Diameter (in cm)							
	Bowl	Jar	Un-known	Total	Not Measur-able	10 or less	10 to 15	16 to 20	21 to 25	26 to 30	31 cm or more	Total
Surface	84	110	29	223	36	6	23	97	32	21	8	223
Structure 6, Level 1	4	7	2	13	0	0	2	5	4	1	1	13
Structure 6, Level 2	140	102	10	252	21	10	36	112	57	14	2	252
Structure 6, Level 2F	63	77	38	178	19	4	25	72	33	15	10	178
Structure 6, Level 3	30	42	2	0	5	0	11	28	25	4	1	74
Structure 6, Level 4	1	8	0	9	0	0	2	6	0	1	0	9
Structure 6, Level 5	0	0	1	1	1	0	0	0	0	0	0	1
Total, Structure 6	238	236	53	527	46	14	76	223	119	35	14	527
Test 1, Level 1	2	3			2		1	1	1			5
Test 1, Level 2	3	3	2		3	1	3			1		8
Test 2, Level 2	1	3	2		3	1	2					6
Test 2, Level 3		1							1			1
Test 2, Level 4												
Total, Tests 1 and 2	6	10	4	20	8	2	6	1	2	1		20
Grand Total	322	346	82	770	90	22	105	321	153	57	22	770

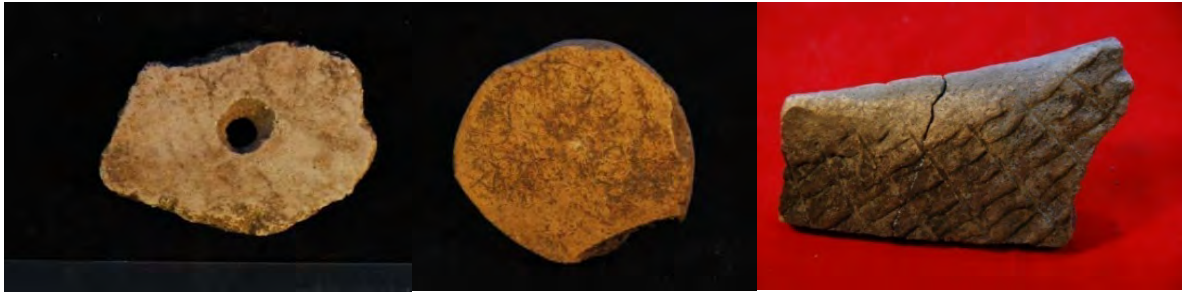


Figure 141. Modified sherds. Left: Shaped and drilled sherd; Unit 1, Level 2 (Lot 4269). Middle: worked sherd, Unit 36, Level 3 (Lot 4497). Right: sherd with beveled edge; Unit 1, Level 2B (Lot 4355).

Three pieces of ground stone came from excavated contexts. None was associated with the floor of Structure 6, which had been cleaned out during abandonment. A mano (17.35 by 8.6 by 6.4 cm) was associated with the thin ash level of Feature 6, in the fill above the floor of Structure 6. The mano has a single convex grinding surface. A hammerstone was associated Feature 15, and a stone ball with Feature 1.

Southern zone stone bowls can be oval or round (and in private collections, we have seen a variety of other forms). In most cases they measure 10 to 20 cm across and have fairly shallow depressions. Stone bowls are quite common on both Viejo and Medio period sites, and we have wondered about their function. A residue analysis that includes this bowl will appear in No. 19, Part 3 of this series.



Figure 142. A stone bowl from the site surface. Found northwest of the Structure 6 excavation area. Lot 4354.

Other Artifacts

The few pieces of worked bone and the single piece of shell collected in 2010 came from Level 3 in the Structure 6 excavation area. This level is one of those that we feel were part of an outdoor area associated with the middle occupation of Structure 5.

Bone

One piece of worked bone, shown in Figure 143, could be a rasp fragment. A tubular bone bead was recovered from Unit 47, Level 2 (Lot 4256). The bead is 1.2 cm long and 0.9 cm in diameter; it had burned. A second tubular bone bead came from Unit 47, Level 2 (Lot 4270). This bead is 1.7 cm long and 0.7 cm in diameter.



Figure 143. Possible rasp fragment from Unit 11, Level 2. Lot 4253.

Shell

A single *Olivella* bead was found in Unit 39, Level 1. It measures 1.2 cm long and 0.6 cm in diameter. Shell items were more commonly found in previous years.

Turquoise

One fragment of shaped, light green turquoise (with very little matrix) measures 1.1 by 1.0 by 0.5 cm. It was found on the site surface, at N 100, E 40 (Lot 4218). The piece was not drilled, but most likely was part of a pendant.

A turquoise tessera from the surface (Lot 4230) was worked on all edges and faces. It measures 0.9 long, 0.4 to 0.5 cm wide, and 0.2 cm thick.

A piece of unworked turquoise (Figure 144) was found on the surface of the Structure 6 excavation area (Lot 4224). It measures 0.8 by 0.7 by 0.4 cm.



Figure 144. Miscellaneous artifacts found in 2010. Left: unworked piece of turquoise; surface, SE Quad of the Structure 6 excavation area (Lot 4224). Right: quartz crystal from Unit 38, Level 2 (Lot 4286).

Quartz Crystal

A quartz crystal (Figure 144) came from Unit 38, Level 2 (Lot 4332).

Pigment

A small piece of white chalk came from the fill of the Structure 6 excavations (Lot 4286). The piece measures 1.1 by 0.9 by 0.7 cm.

Chapter 19

MISCELLANEOUS FIELD STUDIES

Possible Cobble Road

East of Structure 5, and extending parallel to a north-south trending arroyo close to the east edge of the plowed field, was a linear feature of neatly arranged cobbles (Figure 145). This segment of possible cobble road is 3.5 m wide, 40 m long, and oriented 330 degrees west of magnetic north. Sr. Calderón did not remember it ever being used.



Figure 145. The possible cobble road, looking north. Loose rocks are also present in the photo; the road is indicated by the embedded cobbles to the right of the stadia rod.

We excavated a 50 cm by 50 cm test a few centimeters west of the arroyo bank, to 15 cm below the ground surface (Figure 146). The east profile of the feature showed one course of cobbles, laid flat directly on the sterile clayey soil. We did not see any diagnostic artifacts between or below the cobbles.



Figure 146. The test excavation along the possible cobble road. Looking west.

Historical Trash

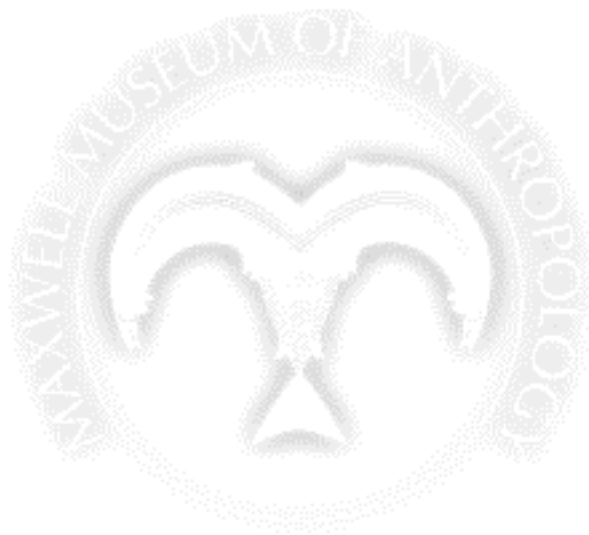
A concentration of historical trash was found 45 meters east of the possible cobbled road and perhaps was associated with it (Figure 147). This feature included chunks of concrete, tin cans, china, plastic, and sacks buried under a few centimeters of topsoil. Sr. Calderón stated that there had once been a house nearby.



Figure 147. Historical trash.

Nearby Surface Finds

During daily breaks, crew members examined other portions of Sr. Calderón's field and collected diagnostic artifacts from the surface. The most important finds came from the south bank of the North Arroyo. These included beads (including one of turquoise), worked shell, Mimbres sherds, and points. We also collected a few corrugated sherds associated with a crumbling plaster floor visible in the north bank of the arroyo.



Chapter 20

RADIOCARBON DATING

Radiocarbon dates were obtained for the 1998, 1999, 2008 and 2010 field seasons. One sample was run at the University of Arizona. Three of the 1998 dates and 11 from 1999 were run by Isotrace Laboratory at the University of Toronto. Dates from 2008 and 2010 were run at the 14Chrono Laboratory at Belfast University; we are fortunate that the director of that lab, Paula Reimer, is a long term collaborator of the PAC. The dates from 1998 and 1999 relate to test excavations and the four structures excavated in 1999. The 2008 dates are from the Structure 5 excavations, which revealed three superimposed houses and an associated external hearth. The 2010 dates come from the Structure 6 excavations. The Chrono14 assays have smaller 1 sigma ranges than previously acquired dates.

At the 2 sigma level, there is complete overlap of possible dates from Structures 1 through 4 (Table 37). However, the calibrated dates with the highest probability suggest that Structures 3 and 4 are later than Structures 1 and 2 and the area north of the North Arroyo (explored in Tests 1 and 2). Based on the radiocarbon dates, the stratigraphic evidence, and the recovered pottery, we feel that Structure 2 is the oldest of the first four structures excavated at the site, and that Structures 3 and 4 are the latest. The superimposed versions of Structure 5 (A–C) parallel the sequence of dates from Structures 1 through 4 (Table 38).

Table 37. Radiocarbon Dates from the 1998 and 1999 Field Seasons.

Lab Code	Lot Number	Provenience	Conventional ¹⁴ C Age BP	2-Sigma Cal Age A.D. with Highest Probability ¹
AA32392	8061	Test 2, Level 4	1085 ± 50	860–1028, 0.969
TO-7600	8032	Test 1, Level 5	1010 ± 70	891–1190, 0.996
TO-7601	8071	Test 2, Level 5	840 ± 70	1147–1283, 0.675
TO-8578	9343	Structure 2, pole in adobe	1070 ± 60	806–1042, 0.954
TO-8580	9129	Structure 2, charcoal from adobe	1030 ± 90	848–1194, 0.944
TO-8581	9120	Structure 3, just above floor	900 ± 90	994–1280, 1.000
TO-8582	9138	Structure 3 just above floor	840 ± 50	1152–1280, 0.789
TO-8583	9341	Structure 4, floor	850 ± 70	1146–1280, 0.634
TO-8584	9341	Structure 4, floor	820 ± 70	1150–1192, 0.753
TO-8584	9341	Structure 4, floor	820 ± 70	1150–1192, 0.753
TO-8585	9340	Structure 4, floor	810 ± 70	1150–1296, 0.791
TO-8586	9098	Structure 1, floor fill	850 ± 50	1151–1277, 0.725
TO-8587	9188	Structure 1, Test 28, Feature 6	1080 ± 110	760–1164, 0.939
TO-8588	9188	Structure 1, Test 28, Feature 6	1010 ± 40	962–1068, 0.744

¹More complete probability figures are given in Stewart et al. (2005).

Table 38. Radiocarbon Dates from the Structure 5 and 6 Excavations.
(2008 and 2010 field seasons)

UBA Lab No.	Raw ¹⁴ C Date	Plus or Minus	Cal. AD ranges (2 σ)*	Proba- bility	Material	PAC Lot No.	Comments
10432	1068	31	895–925 936–1021	0.21 0.79	<i>Zea mays</i>	2923	Unit 2, Level 7, above floor C, Structure 5
10433	975	20	1017–1052 1081–1128 1135–1152	0.51 0.38 0.11	<i>Zea mays</i>	2852	Unit 23, lowest exterior hearth in Feature 14 north of Structure 5
10434	1057	39	894–1027	1.00	<i>Zea mays</i>	2746	Unit 2, Level 5, between Floors 5A and 5B, Structure 5
10435	968	20	1019–1052 1080–1153	0.42 0.58	<i>Zea mays</i>	2999	Unit 21, Feature 73, pit dug from floor 5A, Structure 5
10436	927	20	1036–1158	1.00	<i>Zea mays</i>	2851	Unit 23, Feature 14B, middle level of external hearth
10437	1016	21	986–1034	1.00	<i>Zea mays</i>	2736	Unit13, Level 3, below floor 5A, Structure 5
10438	1010	21	986–1040 1110–1115	0.99 0.01	<i>Zea mays</i>	2711	Unit 4, Level 3, below Floor 5A (?), Structure 5
10442	915	19	1037–1167	1.00	<i>Zea mays</i>	2705	Unit 2, Level 5, Floor 5B1, Structure 5
10443	924	19	1037–1159	1.00	<i>Zea mays</i>	2867	Unit 15, Levels 3–5, Feature 12. Pit extending down from Floor 5A.
10673	931	17	1037–1156	1.0	Graminae	2773	Unit17, Feature 13, Structure 5
10674	1178	18	778–894 929–931	0.995 0.005	<i>Juniperus</i> sp.**	2972	Unit 15, Feature 56. Cultural fill into which Floor 5C was excavated.
10675	1269	20	678–776	1.	Unknown wood	2985	Unit 2, Level 9. Hearth below cultural fill into which Floor 5 C was dug.
10676	986	25	993–1052 1081–1128 1135–1152	0.61 0.30 0.09	<i>Zea mays</i>	2850	Unit 23, Feature14A, the uppermost of the three external hearths north of Structure 5.

Table 38. Radiocarbon Dates from the Structure 5 and 6 Excavations.
(2008 and 2010 field seasons)

UBA Lab No.	Raw ¹⁴ C Date	Plus or Minus	Cal. AD ranges (2 σ)*	Proba- bility	Material	PAC Lot No.	Comments
16361 (2010-11)	885	34	1039–1110 1115–1220	0.34 0.66	<i>Zea mays</i>	4335	Unit 59, Level 5A, Structure 6
16362 (2010-12)	882	20	1048–1086 1123–1137 1149–1217	0.22 0.05 0.73	charcoal	4469	Features 8 and 9, Level 5, Structure 6
16363 (2010-13)	1032	29	900–917 967–1036	0.02 0.98	<i>Zea mays</i>	4512	Unit 23, level 4, Structure 6

*Calibrated with CALIB v. 6.1.1 (Stuiver and Reimer 1993) using the IntCal09 calibration curve (Reimer et al. 2009).

**Charcoal or wood

Taken together, the results suggest that the excavated structures date from roughly the 900s to the late 1100s or even to the late 1200s. The hearth underlying the lowest version of Structure 5 dates to the 700s or 800s.

The date associated with the early hearth fits with a series of earlier dates obtained from Ch-272 and Ch-159 (see Stewart et al. 2005) that suggest occupations that might be called “early Viejo period.” At first the earlier dates appeared to be statistical outliers, but as the number of early dates from different sites increases, it seems more likely that there are Viejo period sites dating to the 700 and 800s (even if so far, there are no houses in the southern zone known to be that early). The Structure 6 dates indicate that the occupation of the structure coincided with use of the external activity area labeled Feature 4, while the date from Feature 9 in the Structure 6 fill postdates use of the structure and apparently reflects use of an exterior area most likely associated with the middle floors of Structure 5.

We have found charts prepared by Paula Reimer to be especially helpful in visualizing the probabilities of dates, and we reproduce it here (Figure 148). More complete information about the 1998 and 1999 dates can be found in Stewart et al (2005); a more recent review of the dates can be found in Kelley et al. (2012).

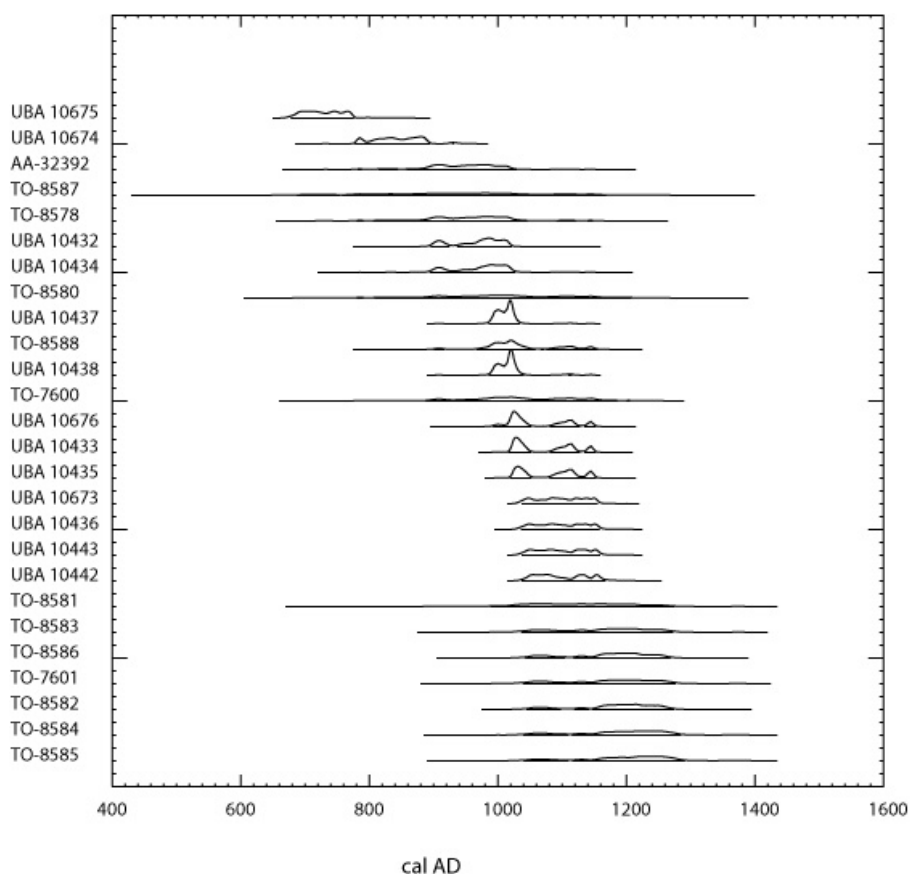


Figure 148. Two sigma ranges for radiocarbon dates from 1998, 1999, and 2008. The 2010 dates are not included. Chart prepared by Paula J. Reimer in 2011.

Chapter 21

ANÁLISIS MACROBOTÁNICO¹

Natalia Martínez Tagüeña

El presente estudio se encuentra en proceso por lo que a continuación se presenta un breve resumen de lo observado hasta el día de hoy. Las muestras fueron recolectadas en el sitio arqueológico Ch-254; provienen de diferentes unidades (2, 5, 6, 10, 13, 15, 17) y de varios elementos (13, 14, 17, 34, 55, 56, 57, 58) como fogones y pisos de estructuras. En ocasiones donde el carbón fue visible y de suficiente tamaño, se recolectó directamente de los contextos durante excavación. Sin embargo, la mayoría de las muestras analizadas fueron procesadas por la técnica de flotación. Las muestras de tierra tuvieron un volumen de 2 litros y se procesaron en campo con un proceso simple de flotado, donde por medio de la agitación manual de la tierra, inmersa en un contenedor de agua, los restos se desprenden de la tierra y flotan hacia la superficie; éstos se recolectan y se dejan secar para poder ser identificados con la ayuda de un microscopio.

La identificación de los macro-restos se realiza por medio de comparaciones de uno a uno, entre la colección de referencia y los materiales arqueológicos desconocidos. El primer paso consiste en separar la muestra en diferentes tamaños por medio de un tren de criba: (1) mayor de 3.36 mm, (2) entre 3.36 y 1.68 mm, (3) entre 1.68 y .5 mm, y (4) menor a .5 mm. El segundo paso consiste en la observación del material con un microscopio binocular de aumento 10–70X; al separar la muestra por diferentes tamaños homogéneos, la observación en el microscopio se facilita. Cabe recordar que únicamente se tomaron en cuenta los restos carbonizados suponiendo que son resultado de actividades prehispánicas. Debido a las alteraciones que sufren los restos macrobotánicos al carbonizarse, la identificación se realizó en su mayoría a nivel de género y Familia. Las identificaciones taxonómicas presentadas en el texto, van precedidas por la palabra “Tipo.” Esta palabra se refiere a que si bien el espécimen asemeja al taxón nombrado, también podría asemejarse a otros especímenes relacionados, o no relacionados.

Se dió prioridad al análisis de cuatro muestras seleccionadas para fechamiento por radiocarbono (Lot [Muestra] 2773, Lot 2850, Lot 2972, Lot 2985,) en donde se identificaron fragmentos de pastos (tipo Familia Gramineae), una cúpula de maíz (tipo *Zea mays*), madera de junípero (tipo *Juniperus* sp.) y un tipo de madera sin identificar todavía. Se cuenta también con nueve muestras de flotación (Lot 2846, Lot 2851, Lot 2873, dos muestras del Lot 2954, Lot 2958, Lot 2959, Lot 2960) en donde el análisis preliminar indica una alta presencia de madera carbonizada bien preservada y en ocasiones redondeada, de los géneros junípero (tipo *Juniperus* sp.) y encino (tipo *Quercus* sp.). También una alta presencia de maíz (tipo *Zea mays*) representado por cúpulas y fragmentos de olote. En menor cantidad se aprecian fragmentos de tallos de pasto (tipo Gramineae) y una semilla del tipo Cheno-am (tipo *Chenopodium* o *Amaranthus* sp.). En espera de una identificación más fina a nivel de género, también se identificaron posibles fragmentos de semillas de leguminosas (tipo Leguminosae).

¹ A second botanical analysis by Martínez Tagüeña, based on samples recovered from the Calderón Site in 2010 and also from other sites, will appear in No 19, Part 3 of this series.

Más adelante se complementará el análisis con semillas y madera que faltan por identificar, al igual que por la integración de muestras recolectadas en futuras temporadas de campo. Por ahora, se puede apreciar diversidad en la selección de recursos de plantas por los habitantes del sitio y buena preservación de material macrobotánico en la zona de estudio.

Chapter 20

CONCLUDING REMARKS

The purpose of this monograph is to describe Ch-254, the Calderón site, based on the studies completed to date, rather than to provide synthetic statements. Those seeking such statements can find them in a number of publications by project members. Nonetheless, a few general remarks seem in order.

Pottery

The Calderón site produced the largest number of sherds of any site investigated by the PAC. Identification of the 58,000 or sherds from the 1998–1999 field seasons, the 12,777 sherds from the 2007 and 2008 seasons, and the 15134 sherds from 2010 (a total of more than 85,000 sherds), occurred in the field laboratory, with small numbers exported for technical analysis and for Karin Burd-Larkin's dissertation research at the University of Colorado (Burd-Larkin 2006). The pottery from the Calderón site was important because it was the first large assemblage of Viejo and Viejo–Medio transitional pottery we handled. The existence of Santa Ana Polychrome, first suspected by David Phillips based on the early deposits at El Zurdo, was confirmed at this site.

Brand (1935), Sayles (1933, 1936), and Gladwin (1936) were correct in assuming that Babícora Polychrome developed, somehow, from the red-on-brown series (possibly from Médanos Red-on-brown). The “missing link,” Santa Ana Polychrome, is comparable to Mata Polychrome, but with thicker line-work. The basic color scheme found in Babícora Polychrome also characterizes Santa Ana Polychrome (red and black lines on a tan to brown, generally unslipped background). The interlocking scrolls and solids often seen on Babícora Polychrome are absent, however. Instead, Santa Ana has designs dominated by alternating, closely spaced, red and black lines, including chevrons and red and black lines branching from (usually) red lines. Red-slipped areas, as well as occasional texturing, can be seen on upper vessel walls of early polychromes. Lumholtz (1902 1, Plate IVa) illustrated a small jar that may be Santa Ana Polychrome.

With the knowledge gained from the Calderón site, we can look at collections made previously and see that such early polychrome was fairly widespread. Art MacWilliams reviewed Sayles' Chihuahua site collections at the Arizona State Museum and found multiple occurrences of Santa Ana-like polychrome. Based on our own collections from the southern part of the Chihuahua culture area, we can say that such polychromes occur at a number of sites in the Santa María and Babícora basins.

At the Calderón Site, Santa Ana Polychrome was not found with Puebloan architecture (contiguous rectangular rooms built of adobe or stone) but with dispersed pit houses, houses with adobe wall bases, and jacal structures. Instead, full-blown Babícora Polychrome (and there are a few sherds of that type at Calderón) is the polychrome typically associated with pueblos in the Babícora Basin and in the Santa María and Santa Clara Valleys.

We had a strong impression that within the southern zone, potters selected motifs from a suite of geometric designs with a pan-regional or pan-areal distribution. The selected motifs were placed on vessels with similar background colors, using similar paints (and in some cases, similar slips, texturing, or both). One may say that the local Medio period polychromes developed in place, drawing on long-standing ceramic traditions. Line designs on the textured wares and red-on-browns were duplicated in early polychromes. Almost identical designs and paint colors occur on ivory, tan, brown, and dark brown surfaces, and similar designs occur on textured pieces.

The southern zone ceramic assemblages include examples of Mata Red-on-brown, Pilón Red Rim, and variations on Anchondo and Leal Red-on-tan. However, more of the red-on-brown sherds are best described as “generic” red-on-brown, due to the often small size of the sherds or lack of identifying attributes. Other red-on-browns, which otherwise probably belong in Victoria Red-on-brown, show designs and brushwork similar to those of the early southern polychromes. Black-on-browns and even brown-on-browns also occur. How much of the color variation in paste, slips, and paints is due to differences in local materials, and how much to potters’ practices, deserves a study of its own.

We were particularly interested in sherds displaying combinations of the basic decorative approaches. The “combos,” though never a large percentage of any assemblage, underscore the nature of the ceramic tradition in the southern zone—a willingness to “mix and match,” in turn reflecting the artistic latitude enjoyed by the area’s potters. The degree to which media and techniques could be recombined creatively are illustrated by rim treatments. Combining plain and red rims with other decorative techniques (including red-on-brown and polychrome paint schemes, black finishes, and a variety of textures), more than 30 design combinations have been recorded for rims.

Assemblage variability is more fully indicated in the ceramic notebooks for individual lots. The notes identify white to off-white sherds, off-white pastes (including for corrugated sherds), red-on-white sherds, and sherds with red-slipped exteriors and white interiors (for an example of the last, see Lot 9009 from the 200N 200E systematic collection unit). Are the off-white pastes and surfaces merely one end of the brown-to-tan color range, or should they be segregated? In practice they were not, but white and off-white sherds seem more numerous at Ch-218 and Ch-254 than elsewhere, and should be re-examined.

Red-on-brown polka dot designs were rare but occurred on both jars and bowls; examples were recovered from the fill of Structures 1, 3, and 4. Other red-painted motifs (in addition to fine, medium, and broad lines) included pendant triangles and larger blocks of red. Red slips could be placed on the smooth sections of partly textured vessels, as could red lines. Red painted designs were also placed directly over texturing. Polished black or red interiors were combined with texturing or polychrome exteriors or, in the case of polychromes, a bowl could have a red slipped exterior and a polychrome interior.

Among the textured wares, one gets the impression of playful combining of various techniques, sometimes with the addition of red slip or paint. By varying the ways in which corrugation, incision, scoring, smoothing, and paint or slip were combined, a wide variety of individualized vessels could be created.

A few sherds normally associated with the Medio period were found at the site, mostly on the surface or in the upper levels. These include a few sherds of Babícora Polychrome, including the only example of a hooded vessel sherd (with coffee bean eyes) found by the PAC in the entire southern zone. Some of the black-on-red sherds were “least unlike” Madera Black-on-red. Texturing continued in the Medio period, and while the popularity of specific texturing techniques may have varied through time, the basic techniques were unchanged.

Architecture

The variety of house forms from Calderón contrasts with the regular progression of sequential house types reported for the Convento site by Di Peso (1974; Di Peso et al. 1974). Excavated structures at Calderón include houses with round adobe wall bases (Structures 1, 5A, 5B, 5C, and 6) and shallow pit houses (Structures 2, 3, and 4). Also a variety of roof support approaches are apparent. An even greater disconnect occurs when the Perros Bravos phase begins in the northern zone. During that phase, the northerners shifted to above-ground houses, but we have never found evidence of an equivalent shift in our own research area.

Over the years, project members have toyed with the idea that the Calderón Site documented not just the Viejo period, but the local transition from Viejo to Medio. Now we are less sure of that, but remain puzzled over the nature of the transition in the southern zone. Other than a fistful of Babícora Polychrome sherds at Calderón and some use of coursed adobe in wall bases, we found nothing at the site that anticipates the Medio period. But then, at El Zurdo (a Medio period site in the Babícora Basin) we had both Viejo and Medio period remains and little evidence of a transition. Perhaps the shift to the Medio period took place in the northern part of the Chihuahua culture area, after which the Medio period “package” spread rapidly southward.

A Floor Assemblage

Floor assemblages were extremely rare during the entire PAC program. The floor assemblage of Structure 5A is the most convincing floor assemblage we found in the Santa María Valley or Babícora Basin (a structure at the Quevedo site, Ch-218, did contain an intact grinding area, a fixed storage area, and several concentrations of pottery). The Structure 5A assemblage was at the base of the plow zone, with plow marks in the floor, so it is miraculous that the assemblage was as intact as it was.

In Structure 5A there was no dedicated grinding area, unlike at Quevedo. A round-bottomed vessel set into the floor near the northwest roof support post appears to have been a permanent storage container for water. A stone mortar was sitting near the north wall of the house. Two concentrations of black polychrome sherds were found, in the northern and southern parts of the house, and one pot was found inside another in the eastern part of the house. There was no formal hearth, but fire-cracked rock and an burned area were found in the eastern part of the house. We believe that the three levels of the external hearth north of the house were associated

with the three house structures, and that the uppermost external hearth was sealed with an adobe cap at the end of its lifespan.

The Village

The Calderón site has become the anchor of our interpretations of the Viejo period in the southern zone, because of the amount of work carried out and the richness of the results.

If the results of the GPR scans reflect the actual number of structures with adobe wall bases, the Calderón site had at least 35 structures. Some of them (Structures 2 and 4, for example) did not register clearly on the scans, so there may have been even more houses than the GPR work suggest. The village spanned perhaps 350 years, so the houses were not all occupied at the same time. Still, Calderón has (or, taking into account the recent plowing, had) more round structures than the much better known Convento site, and for now it holds the record for the largest number of known and suspected houses at a single Viejo period site.

One of the known structures at Calderón was larger than the others, and based on that fact and on its internal features, some project members have interpreted the larger structure as a community structure. This interpretation has been disputed, based on a second circular structure that was almost as large—but that second structure could also be a community structure, dating to a slightly different period. It is interesting that the two largest structures both show evidence of deliberate dismantling at the end of their use life.

All of the excavated structures had been remodeled, including replastering of the floor, suggesting extended occupation of homes. Structure 5 is unique in comprising three different structures, one of them with two separate floors, each built in exactly the same space. The middle house of the three (in chronological terms) is associated with an infant burial with a massive amount of jewelry. The history of this house speaks to us of social memory, and perhaps also to issues of lineage and status related that could relate to seniority of land use rights within the village.

Structure 5 was built over an earlier exterior hearth. The radiocarbon date from that hearth appears to be an outlier in terms of the Calderón series of dates, but similarly early dates are known from other sites (such as Ch-272, along with Ch-159 or El Zurdo in the Babícora basin). We therefore expect that an early Viejo period—predating most of the remains we found—will be defined as more work is done. Some of those earlier remains will be found under components contemporary with the ones we studied, since the southern zone people seem to have used particular locations over long stretches of time. This is clear from El Zurdo, where the occupation appears to extend from the early Viejo period to the end of the Medio period. It is also clear from the Calderón site, with its occupation between A.D. 800 or 900 to about A.D. 1250.

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