

Ceramic Production

In the preceding chapters, we started to outline multiple lines of evidence for ceramic production in a residential context at Ejutla. The amount of broken pottery we encountered during the excavations was overwhelming. Even without counting the many sherds that were no larger than a thumbnail, we collected 210,000 vessel fragments and other ceramic objects weighing approximately 3500 kg. This was the ceramic assemblage associated with one prehispanic house and associated exterior area, the composition of which was fairly standard utilitarian vessels that are typical of Classic period domestic contexts, including jars, bowls, comals, and other forms that we described in chapter 5. Yet we also recovered especially high quantities of some vessel forms. These include *sahumadors* and comals as well as quantities of figurines and ceramic spindle whorls that seemed anomalously large for one household. We also recovered molds for making various ceramic forms, especially figurines, and hundreds of pottery wasters and defective, misfired fragments that could not have served their intended use. Many varieties of ceramic wasters (Redmond 1979) were present in Ejutla, including misfired, misshaped, and spalled fragments. Among the pottery wasters were several hundred malformed, poorly fired, or unfinished figurines.

As we excavated and exposed the firing features, we encountered high quantities of fired clay concretions. These small amorphous and roughly formed fired-clay lumps with heavy concentrations of sand and grit were not potter's clay that was accidentally fired, nor were they obvious partially formed wasters. Rather, they appeared to be remnants of temporary earthen roofs placed over the firing pits (e.g., Stark 1985, 176). Roofs over the firing features would have been necessary to produce the reduced grayware vessels that were prevalent at Ejutla, including numerous *gris* wasters that we recovered in and near the excavated house.

In this chapter, we present the material evidence for ceramic production at Ejutla. We draw on comparisons with the ceramic assemblages from the other sites we excavated in the valley, as those findings are relevant for supporting our interpretation of high-intensity production (see Costin 1991) for exchange in a residential context at Ejutla (Feinman and Nicholas 2000, 2007b). We then provide an expanded discussion of the pit kilns, their contents, and an experimental study that was carried out at the University of Wisconsin to broaden the interpretive perspective for the archaeological firing features at Ejutla (Balkansky et al. 1997; Feinman and Balkansky 1997).

We end the chapter with a discussion of the large figurine assemblage at Ejutla, describing both the production evidence and the range of figurine forms crafted at the site, and key differences between the Ejutla figurine assemblage and those from other Classic period sites in the Valley of Oaxaca (Feinman and Nicholas 2019b; see Appendix 4). Although we present and integrate a variety of evidential sources, the principal goals of this chapter are to document ceramic production, to situate those activities immediately proximate to the domestic unit under study, and to illustrate that some of the pottery products from this context, though mostly locally distributed, were consumed beyond the occupants of the house and the settlement in which it was situated.

7.1. Material Evidence for Ceramic Production at Ejutla

An early indicator for ceramic production in the excavated context at Ejutla was the unusual abundance of figurines in and around the exposed structure, associated with midden contexts, and in the firing features. Fired-clay figurines and whistles are common components of ceramic assemblages at Classic period sites in Oaxaca (Feinman and Nicholas 2019b), and they are often recovered in domestic contexts. Most of the figurines at Ejutla fit within typical classes of Late Classic period Zapotec figurines that include females wearing a range of garments and headdresses, and warriors wearing cotton armor and sporting staffs and shields (Appendix 4, see Figure 4.51). The routine recovery of these and other Oaxaca figurines in domestic contexts underpins the strong inference that they were used in household ritual (e.g., Marcus 1998). But the quantities at Ejutla were anomalous. In total, we recovered 2005 figurines and fragments from the excavations. Why was one household associated with so many figurines? There was great repetition in the represented imagery; the most common forms were molded, full-body warriors wearing a loincloth and females wearing a plain garment (Table A4.1; Feinman and Nicholas 2019b). The great majority were broken at the neck. The detached heads include warriors sporting a variety of headgear and women wearing braided headdresses. Less common were small, modeled human and animal forms, a few of which were complete (see fuller discussion in section 7.7).

Approximately 11% of the figurines were defective in one way or another, including misfired and misshaped fragments. Others had cracked or exploded during firing (Table 7.1, Figure 7.1). Another subset was poorly

Table 7.1. Figurine wasters in the ceramic assemblage at Ejutla.

Defect	Female #1 (braided headdress)	Female #2 (intricate headdress)	Indeterminate	Indeterminate anthropomorph	Male/warrior	Miniature anthropomorph	Modeled animal	Whistle (globular)	Total
Firing error									
overfired	3	–	5	6	10	–	–	1	25
poorly fired/misfired	7	–	9	16	10	–	2	2	46
exploded/cracked	3	–	7	10	10	1	1	2	34
misshaped/distorted	1	–	2	8	1	–	3	–	15
miscellaneous error	–	–	2	8	–	–	–	–	10
Production error									
poorly formed/impressed	2	–	19	6	–	1	1	–	29
unfinished	–	1	24	18	4	1	1	1	50
large inclusion	1	–	2	3	–	–	–	–	6
Total	17	1	70	75	35	3	8	6	215



Figure 7.1. Sample of figurine head and torso wasters.



Figure 7.2. Poorly impressed (top) and burnt figurines (center and bottom).

formed or insufficiently impressed during production, or they may have accidentally been fired before they were finished (Figure 7.2). Many other usable figurines (~half of the assemblage) were not well fired and were eroded with indistinct imagery (Figure 7.3). In all, the defective figurines account for over 20% of all pottery wasters at Ejutla, a seemingly high percentage for a context of domestic production. The number of figurines, and especially the proportion of defective figurines, both seem highly anomalous if production was self-sufficient, geared only for consumption by household residents. Earlier models of craft production would have presumed (e.g., van der Leeuw 1977; Santley et al. 1989) that domestic production was not linked to specialization or exchange, but these findings were instrumental in challenging prior expectations.

The other 778 pottery wasters comprise a range of vessel forms, mostly utilitarian bowls and jars but also *sahumadors*, *comals*, effigy vessels, and associated appliques (Table 7.2). The proportions of pottery wasters

by paste and form largely match the overall ceramic assemblage. Over half of the wasters are from gris vessels, and the majority of gris wasters identified to form are bowls. Approximately 30% of the wasters are café paste, mostly from jars. Wasters from *comals* and most of the *sahumadors* are also café paste. A small quantity (~2%) are from amarillo vessels, mostly bowls and cylinders, which generally ranged in surface color from tan to orange. Many wasters, though, were too malformed, twisted, or partial to identify the form. The defective pieces include a diverse array of misshaped/warped, misfired, and poorly finished vessels (Table 7.3, Figure 7.4, Figure 7.5), often with spalled or exploded surfaces or poorly attached appendages (Figure 7.6). Many vessels broke or cracked across large air bubbles or large inclusions, or were vitrified or honeycombed (Figure 7.7, Figure 7.8). In some instances, unfinished blocks or lumps of clay were fired (Figure 7.9); in others, fingerprints had not been smoothed out before firing and were still visible (Figure 7.10). In addition, a sizable proportion of ceramics at Ejutla, and particularly those deposited near the pit features, were fire-clouded, multitonned, or misfired (mostly oxidized graywares) but still usable (Figure 7.11). Without formal updraft kilns, the Ejutla artisans did not have precise control over the firing process (Feinman and Balkansky 1997, 136), and they produced higher quantities of lower-fired café paste vessels than did ceramic producers in the center of the valley (Feinman and Nicholas 2001b, 142). The Ejutla potters often produced certain vessels in café paste that typically were made in gris (e.g., large cooking jars) or crema paste (e.g., small bowls and jars with red paint washed on the surface or post-fire scratching) in more central locations in the valley (Figure 7.12).

Mixed with the domestic trash were 70 ceramic *moldes* (or flat plates) that were used to turn or revolve clay vessels while forming them in the absence of a potter's wheel (Figure 7.13) and 74 ceramic molds. Domestic potters in Oaxaca still employ *moldes* or revolving platters (Thieme 2009, 22) to fabricate clay vessels. The molds were utilized to make a variety of ceramic forms (Figure 7.14). Some of the clearest molds (17) were for figurines, and another six appear to have been used to make appliques to append to effigy vessels, including feathered headdresses (Figure 7.15), a technology that had not been employed prior to the Classic period. Most of the molds were broken and fragmentary, but several molds match figurine forms common in the Ejutla figurine assemblage. One large mold for a figurine head was intact and closely matches several heads with braided headdresses in our collections (Figure 7.16). One complete mold for a small figurine also matches a figurine recovered on site (Figure 7.17). A small figurine we made with the mold is a close match for the prehispanic object.

Like the figurines, the Ejutla potters appear to have crafted ceramic spindle whorls. The spindle whorls were fabricated in two basic ways, by modeling and firing the clay objects or by abrading repurposed vessel fragments



Figure 7.3. Heavily eroded figurine fragments.

Table 7.2. Other ceramic wasters by general form and paste.

Form*	Amarillo	Café	Gris	Unidentified	Total
bowl	1	38	166	13	218
comal	–	6	–	–	6
jar	3	80	109	32	224
plate	–	2	–	–	2
sahumador	1	28	6	–	35
support	2	6	22	10	40
tecomate	1	2	11	–	14
unknown	6	77	104	30	217
urn	–	2	18	2	22
total	14	241	436	87	778

* see Table 7.1 for figurine wasters.

Table 7.3. Firing and production errors observed in the ceramic assemblage at Ejutla.

Firing error	Quantity
bubbled, cracked	29
exploded	61
misfired	142
misshaped	219
pock marks	25
spawled	42
vitriified	2
unclear	44
Production error	
large inclusion	17
poorly attached	61
poorly finished	135
Total	778



Figure 7.4. Misshaped and warped ceramic wasters.



Figure 7.5. Poorly finished vessel fragments.

(Carpenter et al. 2012). Approximately 70% of the Ejutla whorls were modeled and perforated while the clay was still wet. These modeled whorls have two basic forms, small spherical (bead-like) whorls (e.g., Kent 1957; O'Neale 1945) and flatter, disk-like whorls (e.g., Brewington 2000). The latter have a characteristic lip around the central perforation (Figure 7.18). The other 30% of the whorls were made by abrading a broken sherd into a disk, most often a jar body, and drilling a hole (usually biconical) in the center of the fragment (Figure 7.19). These abraded whorls are generally

slightly concave and often referred to as a centrally perforated sherd disk (Halperin 2008, 115).

The presence of several failed spindle whorls (one spherical and two modeled disk whorls) and ceramic disks that appear to be prepared but unperforated whorls links the Ejutla potters to the crafting of the modeled whorls (Figure 7.20). Most of the spindle whorls that we collected at sites near Ejutla during the earlier regional survey also are modeled, both spherical whorls and disk-like whorls, like those at Ejutla (Table 7.4). Although the whorls have

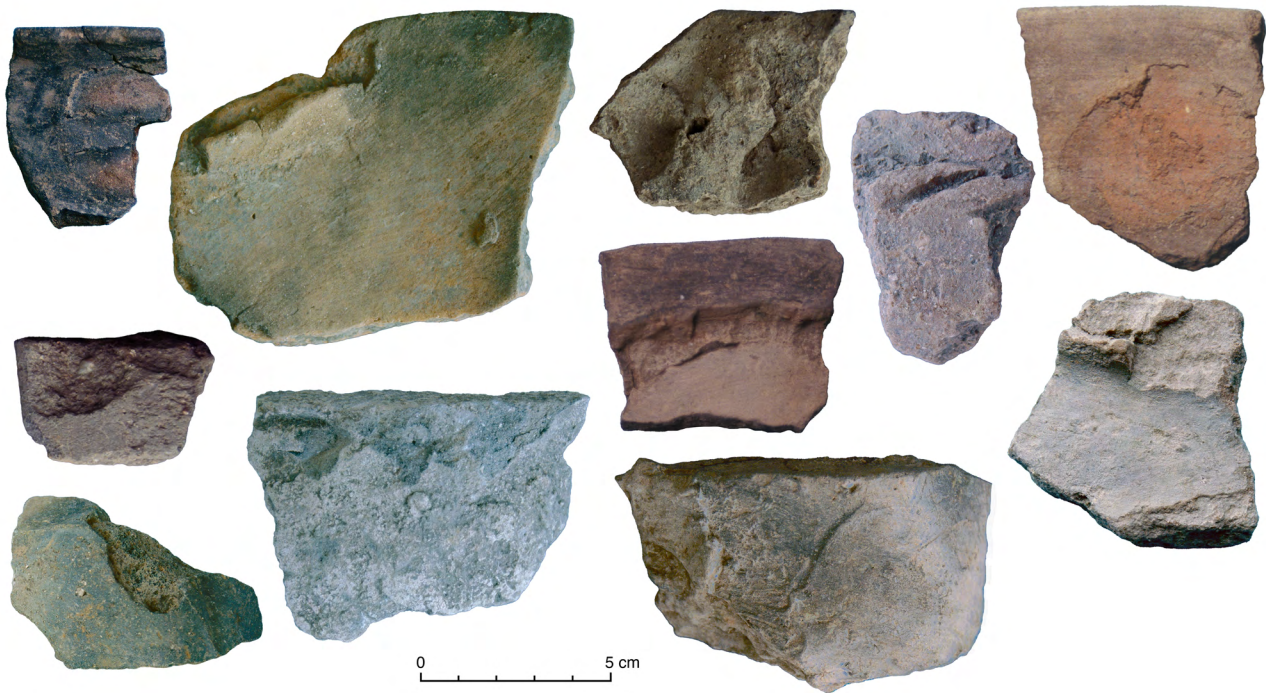


Figure 7.6. Spalled and exploded wasters.

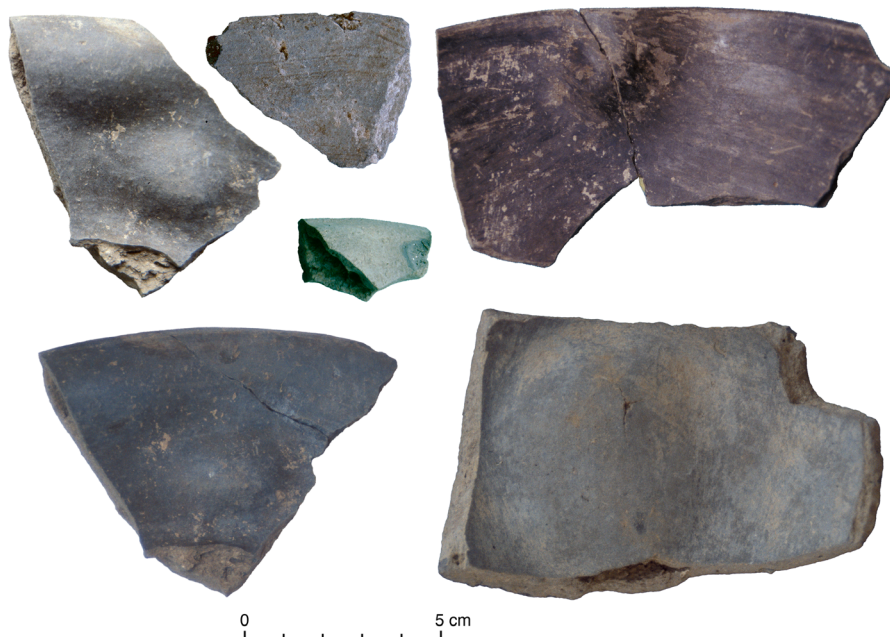


Figure 7.7. Ceramic wasters with large air bubbles and cracks.

not been chemically analyzed, it seems probable that they were made in Ejutla for exchange. Yet the Ejutla potters made some for their own use and repurposed broken vessels into abraded disk whorls as well.

In addition to the material evidence, ceramic production at Ejutla is indicated by compositional analyses of local clays that link them to archaeological vessels from the site. Petrographic analyses of raw clays taken from the current site surface and a sample of figurines and other coarse-paste

vessels recovered from the excavations, including jars, bowls, molds, *sahumadores*, and *comals*, revealed the raw clays to be qualitatively (mineralogically) similar to the pastes of the archaeological vessels (Carpenter and Feinman 1999). Because the coarse-paste vessels require minimal processing, their petrographic signatures were similar to those of the raw clays. In contrast to the figurines and other coarse-paste vessels, which often have large inclusions, some locally produced ceramic bowls from Ejutla were made with processed clays that are significantly finer

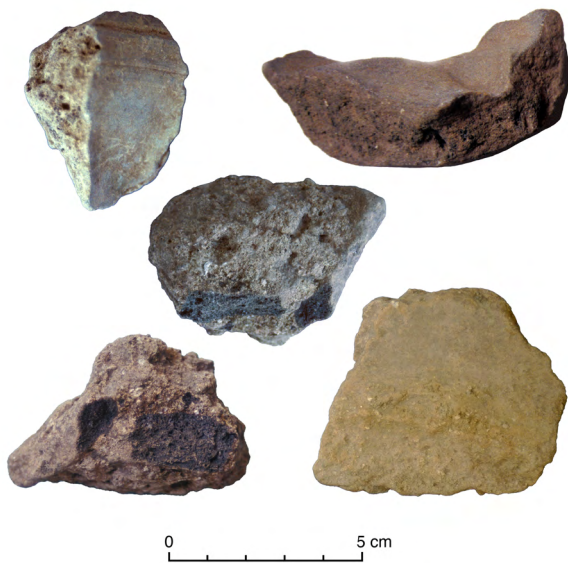


Figure 7.8. Vitrified and honeycombed wasters.

than the available raw clays. To test whether those vessels were made from the same local clays, Andrea Carpenter (Carpenter and Feinman 1999) experimentally beat and levigated the raw Ejutla clays, fired test tiles made from



Figure 7.10. Pottery wasters with finger impressions.

the resultant finer pastes, and then chemically (using inductively coupled plasma mass spectrometry, or ICPMS) analyzed the test tiles and a sample of archaeological vessels. The chemical composition of both reduced fine-paste bowls and oxidized coarse-paste jars from Ejutla were found to be within the range of variation of the test



Figure 7.9. Fired clay blocks and lumps.

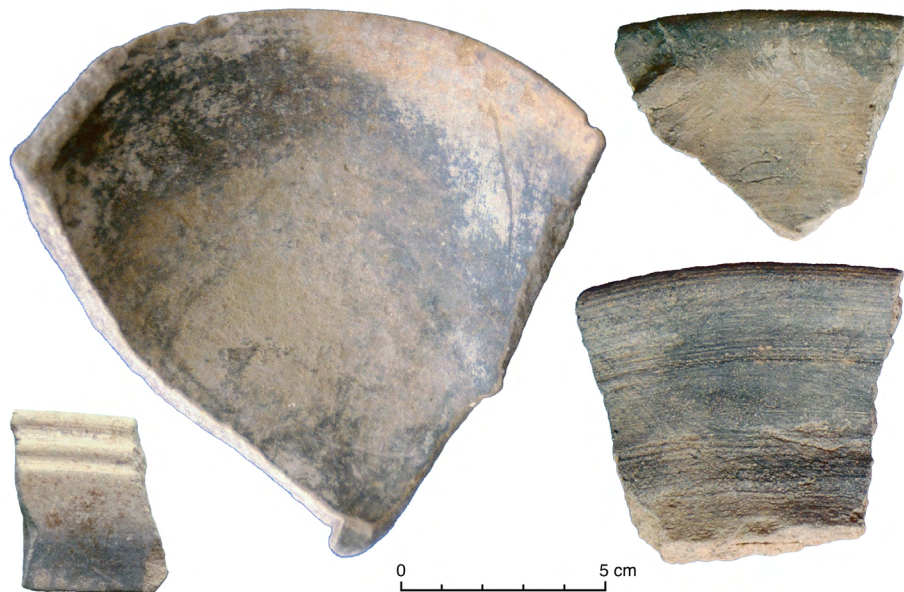


Figure 7.11. Fire-clouded bowl rim fragments.



Figure 7.12. Café paste sherds with post-fire scratching that is more typically found on crema vessels.

tiles. The experimental specimens bracketed the ancient sherds, strongly indicating that all of the latter were made using the local Ejutla clay.

Together, the petrographic, chemical (ICPMS), and experimental analyses confirm that the prehispanic potters of Ejutla had the knowledge to refine and process locally available clays to make a diverse assortment of ceramics. In this domestic context, they produced a range of oxidized coarse-paste vessels and figurines as well as reduced fine-paste bowls (see also Feinman et al. 1989). Petrographic analysis also helped address the question of why we found so many figurines during the excavations. Some proportion of them were produced for exchange. Nearly identical figurine forms were noted in surface collections that we made at several sites within 10 km of the Ejutla site during the earlier Ejutla Valley settlement pattern survey (Figure 7.21). Through petrographic analysis, one of those figurines was found to be a compositional match to the

Figure 7.13. Ceramic molds.

identical figurine forms recovered during our excavations (Feinman 1999, 92; Feinman and Nicholas 2001b, 140). Another figurine in *Urnas de Oaxaca* (Caso and Bernal 1952, figure 453c) that is attributed no more specifically than to Ejutla is a near match for the most complete mold that we found in the excavations almost 40 years later (see Figure 7.16).



Figure 7.14. Ceramic molds.



Figure 7.15. Ceramic molds for making figurines (warrior torso and head) and urn appliques, including feathers.

Several ceramic vessel forms that were rare at Ejutla nonetheless also may have been made at the site. Two forms appear to be distinct to Ejutla (or to sites in the southern part of the Valley of Oaxaca) as they were not present at any of the archaeological contexts we excavated in Tlacolula, nor were they represented in the collections reported from Monte Albán (Caso et al. 1967). These vessel forms include café bowls (sahumadors or braziers) with large medallion appliques and rope appliques on the rim, for which we also recovered several possible molds

(Figure 7.22, see also Figure 5.28). Another uncommon form was an amarillo cylinder with a depressed band below the exterior rim; on some vessels an applique band is situated above the linear depression (Figure 7.23).

We found small numbers of amarillo vessel fragments with exterior carving, mostly associated with contexts early in the occupational sequence. For the most part, these particular bowl and cylinder fragments were made in small quantities, a finding supported by the presence of amarillo vessel wasters in the domestic ceramic complex of this house. One cylindrical vessel has an incised band of small slanted ovals on a bolstered rim; another cylinder has a band of deep crosshatching below the exterior rim (Figure 7.24). A third, thin-walled cylinder with crude geometric carving is heavily fire-clouded and may have been a waster. One amarillo bowl that was broken into many fragments, but almost complete, has deep curvilinear carving (Figure 7.25).

Other rare vessels include spouted jars like those we found in the high-status residences at El Palmillo, so the Ejutla residence would not appear to be low status. All the jars at El Palmillo were made in gris paste, while both gris and amarillo spouted jars were present at Ejutla (Figure 7.26). It is not clear whether the Ejutla potters made these jars mostly for exchange and that is why they were rare on site, or whether they obtained them through exchange. Another rare form are sahumadors with an animal effigy (possibly a feline) on the rim of the bowl (Figure 7.27 top), similar to one example at Monte Albán (Caso et al. 1967, figure 334b); in another example the effigy is on the end of the handle.

Although we found few brazier supports (Figure 7.27 bottom left), we suspect these utilitarian implements were also made locally; two elongated supports appear to be from the same brazier, while one broader and shorter brazier support is the same form as a rare single object from the excavations at Miahuatlán (Markman 1981, plate 17). An unusual support in the form of an animal's head looks like a mouse (Figure 7.27 bottom center). A final rare ceramic object is shaped like a phallus (Figure 7.27 bottom right; see Joralemon 1974, 65, figure 11); the piece is not broken, so it is not clearly a handle or support, and its use is unclear.

7.2. Comparison with Excavated Classic Period Sites

Compared to the other Classic period contexts we excavated in the Valley of Oaxaca, Ejutla stands out in terms of the overall volume of ceramics and the various indicators of ceramic production detailed in section 7.1 (Table 7.5). Only on the lower terraces at El Palmillo did we find a possible firing feature (it was much smaller than those at Ejutla) (Feinman and Nicholas 2004a, 176, 2007d; Haines et al. 2004). We did not excavate any firing features during our investigations at Lambityeco (Feinman et al. 2016), but given wasters and other ceramic evidence of production that we recovered in the excavations, ceramic



Figure 7.16. Complete ceramic mold for a figurine head with braided headdress.



Figure 7.17. Complete ceramic mold for a small figurine (center), with a matching figurine from Ejutla (right) and a figurine that we made using the same mold (left).

production may have occurred nearby. During earlier excavations in other parts of the site, ceramic production was documented as an important economic activity at Lambityeco (Lind and Urcid 2010; Payne 1970; Peterson 1976).

We base our comparisons among the sites and houses on rim sherds and other diagnostic, decorated, or otherwise significant pottery fragments and do not include nondiagnostic body sherds (which comprised over 70% of the Ejutla ceramic assemblage). Given the different

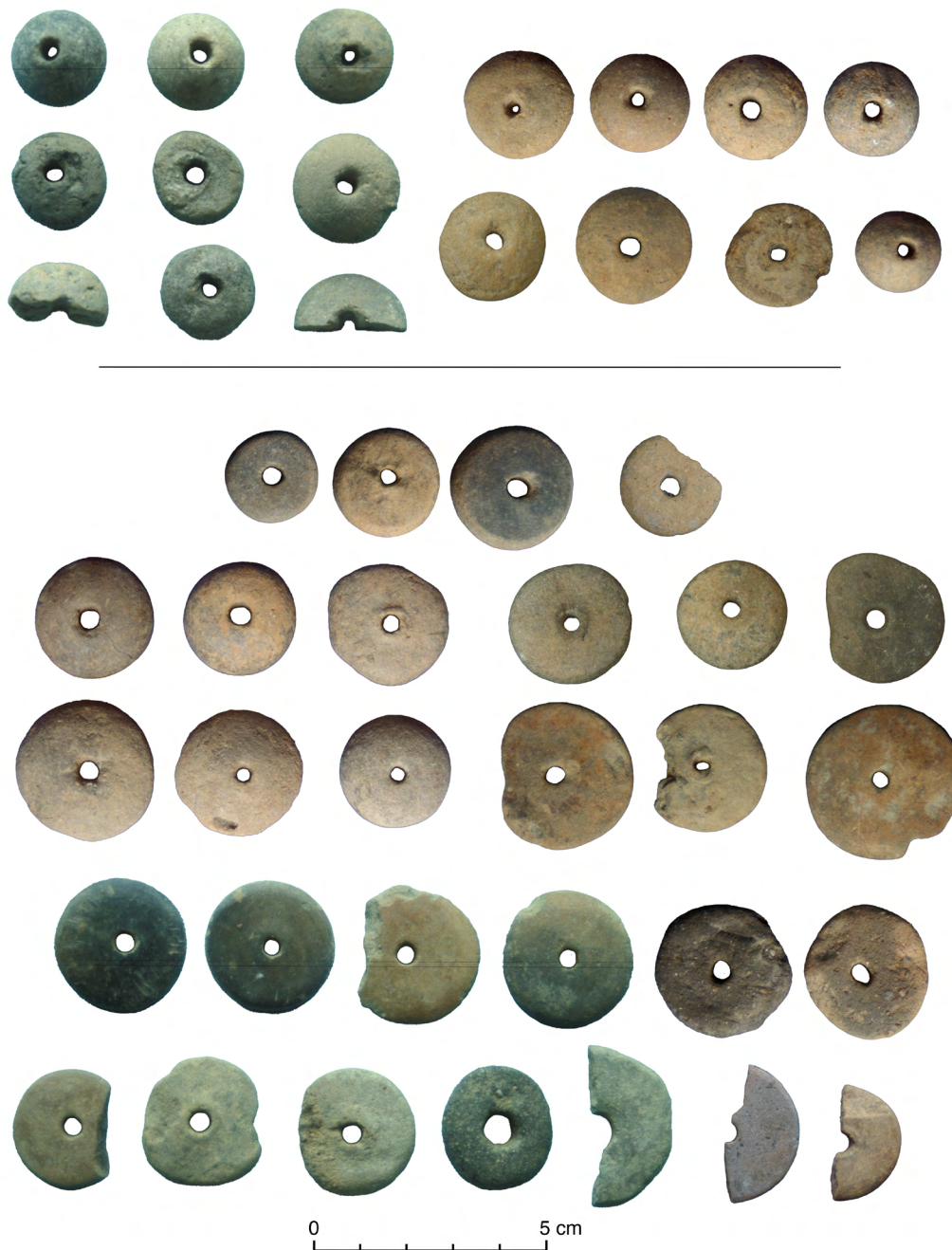


Figure 7.18. Modeled spherical (top) and disk-like spindle whorls (bottom).

number of houses excavated at the four sites, we compare per-house quantities, even though, in all cases, the totals for all eight residences at El Palmillo and all three at the Mitla Fortress are lower than for one house at Ejutla.

Per residence, the volume of ceramics at Ejutla was three to six times greater than at El Palmillo and the Mitla Fortress (see Table 7.5). Differences in the quantity of ceramic figurines were even greater, with 10–20 times as many figurines at Ejutla than in domestic contexts at either El Palmillo or the Mitla Fortress. The higher quantities of ceramics and figurines at Lambityeco reflect their use in public rituals hosted by priests who resided in the domestic

structure on Mound 165 (Feinman and Nicholas 2019b) (differences in the figurine assemblages at the four sites are discussed in section 7.7 and more fully in Appendix 4). Pottery wasters, defective figurines, molds for a range of vessels including figurines, and moldes also are much more abundant at Ejutla, both in raw numbers and as proportions of the ceramic assemblages. The one context that stands out from the others beyond Ejutla is the lower group of houses at El Palmillo. As a proportion of the ceramic assemblage at each site, pottery wasters comprise approximately 1.8% at Ejutla and 0.8% on the lower terraces at El Palmillo. For all other contexts the proportions are between 0.3% and 0.4%. The presence of at least one small firing feature

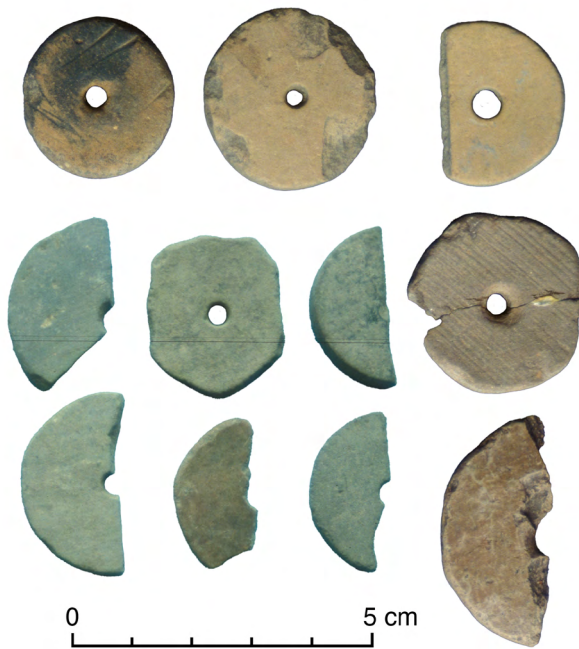


Figure 7.19. Abraded spindle whorls.

on a lower terrace at El Palmillo accords with the higher proportion of ceramic production indicators in that context relative to the other non-Ejutla contexts. The low numbers of material indicators of pottery manufacture that were recovered from the other excavated houses compared to Ejutla would indicate that those households either

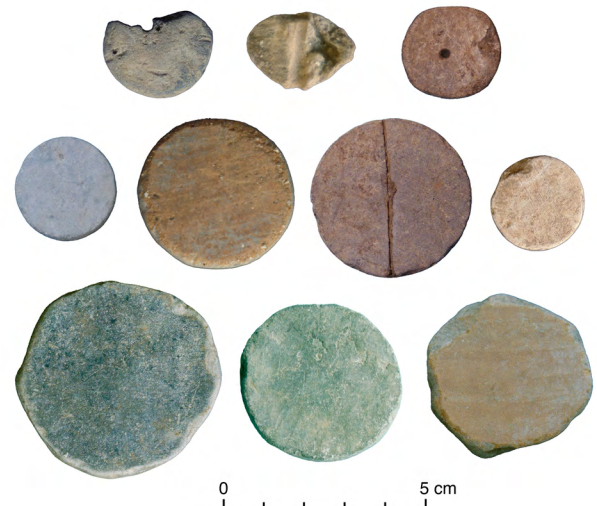


Figure 7.20. Spindle whorl wasters (top) and unperforated, unfinished sherd disks.

did not make pottery or only engaged in low-intensity production for immediate use. In contrast, the much higher quantities of all indicators associated with one residence at Ejutla support the argument that high-intensity ceramic production for exchange occurred in that context (Feinman 1999; Feinman and Nicholas 2000, 2004a).

Spindle whorls of all three size categories (see section 5.3.1) are present at El Palmillo, the Mitla Fortress, and

Table 7.4. Abraded and modeled spindle whorls* at Ejutla (excavation and survey), Lambityeco, El Palmillo, and the Mitla Fortress.

Site	Context	Abraded	Modeled total	Modeled disk	Spherical	Total
Ejutla excavation	–	32	77	42	35	109
Ejutla regional survey	–	3	9	5	4	12
El Palmillo	lower 3 terraces	44	1	–	1	45
El Palmillo	middle 2 terraces	27	4	4	–	31
El Palmillo	upper 2 residences	67	19	19	–	86
El Palmillo	top (Platform 11)	18	8	8	–	26
Mitla Fortress	3 houses	28	7	6	1	35
Lambityeco	M165	25	15	15	–	40
Site	Context	Abraded	Modeled total	Modeled disk	Spherical	
Ejutla excavation	–	29.4%	70.6%	38.5%	32.1%	
Ejutla regional survey	–	25.0%	75.0%	41.7%	33.3%	
El Palmillo	lower 3 terraces	97.8%	2.2%	–	2.2%	
El Palmillo	middle 2 terraces	87.1%	12.9%	12.9%	–	
El Palmillo	upper 2 residences	77.9%	22.1%	22.1%	–	
El Palmillo	top (Platform 11)	69.2%	30.8%	30.8%	–	
Mitla Fortress	3 houses	80.0%	20.0%	17.1%	2.9%	
Lambityeco	M165	62.5%	37.5%	37.5%	–	

* Quantities are totals for all residences in a site sector (El Palmillo) or site (Mitla Fortress).

Spindle whorls were collected at 10 sites during the Ejutla regional survey.



Figure 7.21. Figurines from other sites in the Ejutla Valley that were collected during the regional survey.

Lambityeco, as well as at Ejutla (Table 7.6; Carpenter et al. 2012, 391; Feinman and Nicholas 2012, 245), albeit in different proportions that in part reflect access to specific fiber resources. Larger and medium spindle whorls are more appropriate for spinning coarse fibers, such as from the fronds of maguey, which is an abundant genus in eastern Tlacolula, whereas the smaller whorls would have been used on cotton and other fine fibers. What stands out about the Ejutla whorls is the number associated with one house and the formality of the whorls compared to the other sites. The Ejutla household had twice as many spindle whorls as any residence at the other sites. In addition, most of the whorls at those sites are the abraded variety made from repurposed vessel fragments, even on the lower terraces at El Palmillo where some ceramic production was carried out, whereas most of the spindle whorls at Ejutla are modeled (see Table 7.4). Spindle whorls are only one of a number of tools, including a range of bone tools (Feinman et al. 2018b), that were used to process fiber into thread. All of these were recovered with frequency from all three Tlacolula Valley sites (Feinman and Nicholas 2012, 2016b). Possibly due to lack of access, the Tlacolula fiber workers more often made their own more expedient whorls from ubiquitous ceramic sherds. The residences at the top of El Palmillo had greater

proportions of modeled disk whorls (~30%). Whether those whorls were made elsewhere at El Palmillo or were traded from a site like Lambityeco, where there also were higher quantities of modeled whorls, is unknown, but in a trace element analysis of Classic period pottery in the Valley of Oaxaca (Minc et al. 2015), approximately 18% of utilitarian pottery sampled from El Palmillo was produced farther to the west in the central part of the Tlacolula Valley. Although the ceramic objects produced by the Ejutla potters were exchanged beyond their barrio and to their closest neighbors in the southern end of the valley, they do not appear to have been exchanged as far as the eastern arm of the valley (Minc et al. 2015).

7.3. The Pit Kilns

As we were finding evidence of shell working in and around the house and middens, we were also finding multiple indicators of ceramic production, as outlined in section 7.1. The close proximity of the production debris to the house tied both of those activities to the residents of the prehispanic structure. Yet although more than half of the pottery wasters at Ejutla were from gris paste vessels (see Table 7.2), which require a reducing (low oxygen) atmosphere, we had no remains of obvious kilns, like the



Figure 7.22. Café medallions and molds (two in upper left).



Figure 7.23. Amarillo cylinders with a depressed or applied band below the rim.



Figure 7.24. Other unusual amarillo vessels at Ejutla have a band of small slanted ovals (top), broad panels of crosshatching (center), and other carved designs (bottom).



Figure 7.25. Potsherds from one carved amarillo bowl that was found broken in situ (the two sherds on the right are from different but similar vessels).



Figure 7.26. Spouted jars from Ejutla that are similar to ones on high-status residences at El Palmillo.

two-chambered updraft kilns at Atzompa and Monte Albán (Payne 1982; Winter and Payne 1976). Those more formal kilns were built of stone and mortar and had separate chambers for the fire and the wares, and the Ejutla pit kilns were not like the updraft kilns at Atzompa (Mendoza

Escobar 2014), Monte Albán (Winter and Payne 1976), or Macuilxochitl (Faulseit et al. 2016; Winter et al. 2007). Other less substantial firing features at Monte Albán were simple updraft kilns dug into the bedrock (Markens and Martínez López 2009), and elsewhere in Oaxaca indirect-firing kilns have two horizontal chambers separated by a flue or wall (Flannery and Marcus 1983, 299; Whalen 1981, 97). Given the ubiquity of pottery in Mesoamerica, archaeologically documented kilns are rather rare (e.g., Payne 1970; Santley et al. 1989; Stark 1985). In their absence, Mesoamerican archaeologists have generally relied on other material correlates of pottery production, such as anomalous densities of potsherds and specific ceramic types, clay concretions, ash lenses, and wasters (e.g., Feinman 1980, 1982; Krotser 1987; Redmond 1979; Stark 1985), to identify loci of production. These criteria, however, are indirect measures that are subject to equifinality, such that each cannot be taken alone as a definitive indicator of ceramic production (Feinman



Figure 7.27. Unusual and rare ceramic forms include sahumador rims and handles with animal effigies (top rows), brazier supports (bottom left), an animal support (bottom center), and a fine-paste ceramic object shaped like a phallus (bottom right).

Table 7.5. Ceramic production indicators at Ejutla, Lambityeco, El Palmillo, and the Mitla Fortress.*

Category	Ejutla house	El Palmillo lower (per house)	El Palmillo middle (per house)	El Palmillo upper (per house)	Mitla Fortress (per house)	Lambityeco M165
Ceramic rims and diagnostics	57092	14666	15805	18636	8494	27000
Figurines (excavation only)	2005	111	139	168	188	1770
Fig wasters	215	8	7	10	4	9
Other wasters	778	105	42	38	26	80
Total wasters	993	113	49	49	30	89
Total molds	74	13	16	1	5	12
Molds for figurines	17	1	2	–	3	11
Moldes	74	3	1	1	1	12
Concretions	1035	8	5	3	1	4
Spindle whorls (ceramic)	109	15	15	37	12	40
% urns in café paste	40.0%	12.1%	5.9%	9.9%	0.3%	7.4%

* For El Palmillo the listed amounts are the average for the residences in each site sector; for the Mitla Fortress they are the average for 3 residences.

Table 7.6. Spindle whorls of different sizes at Ejutla (excavation and survey), Lambityeco, El Palmillo, and the Mitla Fortress.

Context	Large (>29 g)	Medium (8–29 g)	Small (<8 g)	Indeterminate	Total
Ejutla excavation	–	19	83	7	109
Ejutla regional survey	–	2	10	–	12
El Palmillo	19	102	71	2	194
Lambityeco	3	35	17	–	55
Mitla Fortress	6	17	13	–	36
Total	28	175	194	9	406

and Balkansky 1997; Stark 1989). Although a range of archaeological indicators are recoverable to identify pottery production, the case is always stronger when we can marshal multiple lines of evidence.

What we did find under the middens and even below the house were shallow pits that the ancient Ejutleños had dug into the soft bedrock (see Figure 4.1). There were no stone or adobe walls associated with these bedrock features, but, as we outlined briefly in chapter 4, they had other characteristics that indicated they were used to fire pottery. The features were slightly asymmetrical, with a narrowing of the depressions into what appears to be a stoke pit, or mouth, to add fuel and ventilate the kiln (see Figures 4.19–4.21). The levels below the middens that were in direct association with the bedrock pits held a more restricted artifact complex, largely limited to ash, ceramic wasters, clay concretions, a few rock cobbles, burnt bedrock, and potsherds. The layers of ash, charcoal, and burnt bedrock could be from other firing activities, but the shape of the features, the quantities of wasters, spacers, large broken but unused vessels that appear to have been used as kiln furniture, and high quantities of specific vessel forms in and around the firing features pointed to ceramic production, using the bedrock depressions as pit kilns. In

addition to the large number of defective sherds and pottery byproducts, many broken but unused ceramic vessels and the most abundant ceramic varieties—especially molded figurines, *sahumadors*, *comals*, and certain types of reduced (*gris*) bowls—were more localized in and adjacent to the pit features than were other ceramic categories (Feinman and Nicholas 1994).

The pit features and surrounding deposits at Ejutla also had high quantities of amorphous clay concretions (Figure 7.28). Similar ‘amorphous clay lumps’ or ‘numerous fire-hardened fragments of loam’ (with grass imprints) in pit deposits containing dense layers of ash, charcoal, ceramic wasters, and figurines at the Peñitas site in Nayarit, Mexico, have been interpreted as the remains of an impermanent earthen cover or roof that was placed over the firing pits (Bordaz 1964). Sheehy (1992, 768–69) argues that ephemeral firing features at Tlajinga 33 at Teotihuacan may have served as pit kilns, as described in ethnographic accounts of potters in South Asia (Rye and Evans 1976, 165–66); the term has since been applied more broadly (e.g., Heacock 1995; Rice 1987, 158). These are not true ceramic kilns, in that they do not separate the fuel from the wares (e.g., Rhodes 1968, 11). Rather they are a less costly option for intermittent producers.

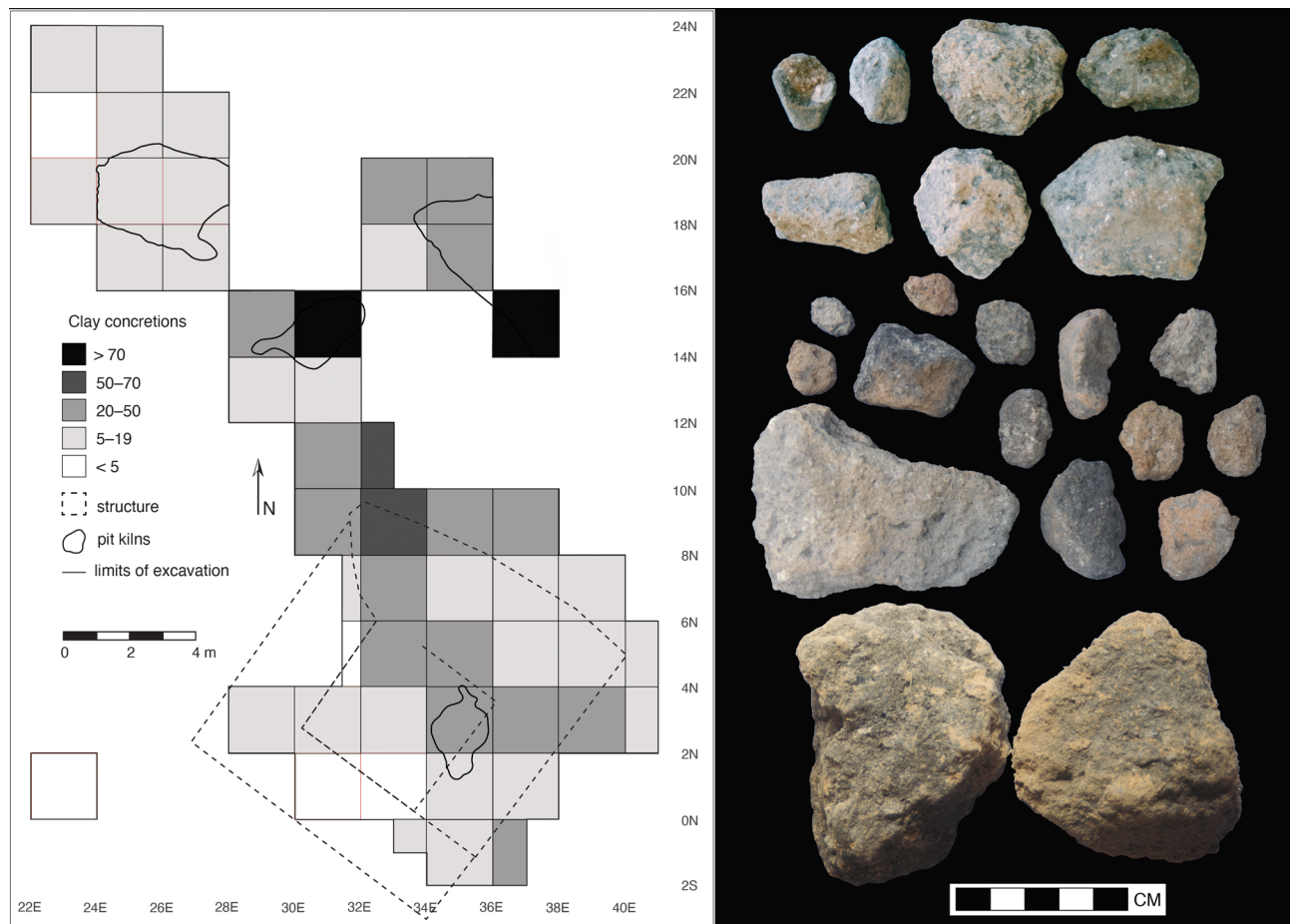


Figure 7.28. Clay concretions and map of clay concretion distributions in the excavated area.

Based on the nature of the firing features at Ejutla and their associated artifactual remains, the Ejutla potters used these depressions as pit kilns to fire pottery.

Reduced grayware vessels are prominent in the prehispanic ceramic tradition of the Valley of Oaxaca (Caso and Bernal 1965), and they are the dominant ware in the Ejutla ceramic collections (including pottery wasters). But based on the nature of the full excavated ceramic assemblage from Ejutla, the site's potters did not have the control over firing in pit kilns that would have been expected with updraft kilns (Balkansky et al. 1997, 150–51). The paste of many sherds had more or less sharp boundaries between the surface and the core, indicating they were fired in a poorly controlled firing atmosphere in which maximum temperatures were sustained only for short periods of time (Balkansky and Crossier 2009; Rice 1987; Velde and Druc 1999). Misfired sherds were common. For example, most figurines were oxidized café, but a small number appear to have been reduced accidentally. Similar inconsistencies in coloration were evident for most of the forms produced by the Ejutla potters. We found multitonned and fire-clouded vessels with regularity (see Figure 7.11). Frequent firing errors of these sorts are the likely consequence of direct-fuel firings, as would occur in pit kilns, where fuel and vessels are not completely separated (Vitelli 1993, 207).

There also were relatively high quantities of café pottery in the Ejutla excavations (~40%) compared to the other Classic period contexts we excavated (Table 7.7). The El Palmillo lower terraces (the context with the pit kiln) also had slightly higher quantities of café pottery. In addition, Classic period effigy vessels in Oaxaca are most often made of gris paste, but a much higher proportion in Ejutla are café (see Table 7.5). Café vessels are generally low fired in aboveground and open firings (Balkansky and Crossier 2009). Depending on the control of air flow, they also could be fired in pit kilns.

7.4. Ceramic Firing: Experimental Analyses

To broaden our interpretive understanding of the archaeological firing features at Ejutla, we had an experimental pit kiln constructed and fired at the outdoor archaeology laboratory at the University of Wisconsin in Madison (Balkansky et al. 1997; Feinman and Balkansky 1997). There is no contemporary analog to pit firing in the Valley of Oaxaca. Today's artisans in several pottery-producing villages use updraft kilns to fire their wares (Atzompa and Coyotepec) that are transported to markets throughout the region, whereas in the remote village of San Marcos Tlapazola, in the eastern arm of the valley, the potters open-fire brownware (café) comals and bowls that are marketed much more locally (Feinman et al. 1992;

Table 7.7. Percentage of the four principal ceramic wares in the assemblages of sites excavated by Feinman and Nicholas.

Ceramic ware	Ejutla	El Palmillo lower terraces	El Palmillo middle terraces	El Palmillo upper terraces	Mitla Fortress*	Lambityeco
crema	0.52%	0.06%	0.06%	0.01%	–	–
amarillo	4.63%	14.87%	12.55%	10.27%	11.82%	6.21%
café	39.78%	31.61%	29.05%	25.04%	13.59%	20.62%
gris	55.08%	53.46%	58.34%	64.68%	74.58%	73.16%

* Site occupation extends later into the Postclassic period.

Shepard 1963). Therefore, to better match the form of the firing features at Ejutla, the design of the experimental pit kiln was modeled after ethnographic descriptions of traditional potters in India, Pakistan, and the southwestern United States (e.g., Rice 1987; Rye 1981; Shepard 1961; Sinopoli 1991). A shallow depression was dug into the ground and then lined with a layer of sand to serve as a post-excitation referent. To improve the draft, the floor of the kiln was inclined slightly, with the open end, or ‘mouth,’ a bit deeper than the back end of the depression. The chamber was then filled with various vessel forms (including comals and test tiles), kiln furniture (to separate the vessels and improve air flow), and fuel (cow dung, grasses, and tree branches). The mixture of pottery and fuel was then covered with straw to form a matrix on which mud plaster was spread to construct the roof.

The mud plaster roof provided structure to limit damage wrought by the shifting of pots as the fuel was consumed and insulation to conserve fuel and better control the temperature and firing atmosphere. Atmospheric conditions in the pit kiln could be modified throughout the firing, by opening air holes in the mud plaster dome to maintain an oxidizing atmosphere or by smothering the fire to create a reducing atmosphere. The ease with which the enclosed nature of these kilns allowed potters to smother the fire (Rye 1981, 98) would have made pit kilns well suited to producing reduced grayware vessels (Feinman and Balkansky 1997, 139).

After firing was complete, the roof was broken, and the feature was excavated. After the fired vessels were removed, the excavated experimental pit kiln left few indications that a stage in ceramic manufacturing had occurred there. Evidence was limited to a number of broken vessels damaged in the firing, a thin layer of ash mixed with charcoal, and the ground surface beneath the kiln discolored and partially baked to a depth of 1 cm. Few of these residual materials would likely survive intact on an exposed surface, but repeated use of the feature over time or rapid sealing of the deposits may have left unusual concentrations of potsherds, perhaps particular ceramics, and wasters that would resemble the contents of the ancient pit kilns at Ejutla.

The most prominent feature of the firing experiment, however, was the pit kiln’s mud plaster covering. Once fired and broken, the fragments strongly resembled the clay

concretions that were abundant at Ejutla (see Figure 7.28) and other pottery-making sites in Mesoamerica (Bordaz 1964; Redmond 1979; Stark 1985, 176). The ‘fired adobes’ so prevalent at Tlajinga 33 (Sheehy 1992) may represent the same kind of residue. Although other processes might result in similar concretion-like materials, their presence in contexts where numerous other indicators of ceramic production (including the pit kilns) have been recovered indicates that these amorphous, burnt artifacts may be all that remain from impermanent roofing.

7.5. Firing Temperature Experiment

Another aspect of the pit-kiln experiment was to measure firing temperatures. Prior to firing, four thermocouples were placed at different locations in and beneath the pit kiln to record temperatures every 15 minutes during the course of the firing. The highest temperature reached was 768 °C, and the temperature needed to make a useful pot (above ~500 °C) was sustained throughout the kiln for more than 5 hours (Balkansky and Crossier 2009, 60). To interpret these results, we compared them to firing temperatures that we observed in prior experiments on the three major grayware serving bowl varieties (G-12, G-35, and G-3M) in the Valley of Oaxaca (Feinman et al. 1989, 1990, 1992). The sherds used for the firing and other technical analyses were drawn from the surface collections made during the regional surveys of the Valley of Oaxaca and the Ejutla Valley, including from the surface of the Ejutla site itself. As we discussed in chapter 4, G-12s and, especially, G-35s were abundant at Ejutla, while the later Postclassic G-3Ms were much rarer in our excavated contexts.

The thin, hard-fired G-3Ms are much less porous (smaller proportion and size of inclusions) than the earlier G-12s and G-35s and were, on average, fired at higher temperatures (~696 °C). The mean temperature for both the G-12s and the G-35s was 664 °C, although the G-12 from Ejutla was at the low end (640 °C). The firing temperatures estimated for the prehispanic bowls fall mostly within the range of those recorded for a contemporary, open-fired San Marcos vessel (620 °C) and a kiln-fired Coyotepec pot (850 °C) (Feinman et al. 1989, table 3). Although temperatures in the well-controlled firing in the experimental pit kiln reached levels high enough to make the finer-paste G-3Ms, they were not consistent across the pit kiln or sustained over time (Balkansky and Crossier 2009, 66). The pit kilns

were better suited for making the earlier G-12s, G-35s, and other coarse-ware jars and bowls and ceramic figurines that were abundant at Ejutla, both gris and café; they did not require as high a temperature, and the greater porosity provided mechanical strength to withstand firing and knocking against other vessels. These technical analyses add support for the use of pit kilns at Ejutla to fire gris and café pottery, adjusting the mud plaster covering as needed to provide or cut off oxygen.

7.6. Comparing the Pit Kilns and Their Contents

The ceramic assemblages in the pit kilns are similar to the pottery found in other contexts at the site, both in and around the house and throughout the middens; together

with the petrographic analyses discussed above, they tie the firing features to the house and the domestic trash of its residents. Although the pit kilns varied in size, depth, and state of preservation, they were similar in most key respects. All were asymmetrical depressions dug in the bedrock, with a narrowing of the bedrock depression into a stoke pit, or mouth, visible in the three pit kilns that were excavated completely. The bedrock surfaces of the pit kilns were blackened from repeated firings. All the pit kilns had high densities of ash and charcoal, with basal layers of almost pure ash. In addition to large potsherds that served as kiln furniture, they all contained café and gris wasters mostly of bowls and jars, figurine wasters, concentrations of certain vessel forms, clay concretions, and other remnants of ceramic production (Table 7.8). In

Table 7.8. Principal contents of the Ejutla pit kilns.

	Pit kiln 1	Pit kiln 2	Pit kiln 3	Pit kiln 4	Pit kiln 5	Total
Vessel forms and other categories						
Café comals	13	201	408	336	164	1122
Café jars	390	126	323	281	136	1256
Café bowls	45	110	94	162	87	498
Café sahumadors	3	116	213	480	61	873
Gris bowls	162	449	1444	1072	446	3573
Gris jars	37	134	350	254	101	876
Amarillo bowls	84	21	59	59	21	244
Amarillo jars	14	4	6	2	2	28
Concretions	22	51	51	6	46	176
Figurines	12	54	144	72	19	301
Total	782	1266	3092	2724	1083	
Waster form by paste						
Amarillo						
bowl	–	–	–	–	1	1
jar	–	–	1	–	–	1
Café						
bowl	2	4	3	1	1	11
comal	–	1	1	–	–	2
figurine	4	3	21	16	4	48
jar	4	6	8	6	6	30
sahumador	–	2	4	3	2	11
support	–	–	1	–	–	1
unknown	1	3	4	2	5	15
urn	–	–	1	–	–	1
Gris						
bowl	2	7	13	8	3	33
figurine	–	–	3	–	–	3
jar	2	5	3	9	3	22
sahumador	–	–	1	–	–	1
support	–	–	1	–	4	5
tecomate	–	–	–	1	–	1
unknown	5	2	5	2	6	20
urn	–	–	2	–	–	2

most cases these distributions do not tie any one ceramic form or ware to only one pit kiln. Clay concretions were recovered, albeit in varying amounts, from all the pit kilns (see Figure 7.28), indicating that temporary roofing was applied at least occasionally in all the kilns to help control the firing and provide a reducing atmosphere when the desired product was a gris vessel. Yet there is variation among the pit kiln assemblages to indicate that certain ones may have been used to fire specific forms more often than others.

The ceramic assemblage in the pit kiln under the house (pit kiln 1, 2n34e) is the most different, largely because the pottery is from the earliest occupation of the area (see Table 4.3). The pit kiln contains several early amarillo and café forms that also are abundant in the fill below the house. Although much of the material in the fill appears to have been brought in to create a level surface on which to construct the house, some of the ceramics came from the upper levels of the firing feature that was destroyed in the process of preparing the surface to construct the residence. Among the pottery recovered in the pit kiln are early grayware vessels (G-12s) that date from the Late Formative (Monte Albán Late I), including a defective G-12 bowl rim that had exploded on the exterior (see Figure 7.8 top left). Café jars, especially raked ollas that date early in the Ejutla sequence, also are abundant in the pit kiln under the house, including several café jar wasters. Both vessel forms are prevalent in the collections from the fill under the house. Although we did not recover many figurines from pit kiln 1, several of them are wasters. There also were hundreds of figurines and dozens of wasters in fill under the house floor, so Ejutla artisans were making figurines from early in the occupation of the eastern barrio of the site.

The assemblages in the other four pit kilns include very low numbers of the same early ceramics present in pit kiln 1 (see Table 4.3), so we cannot rule out that some of those features were at least partially contemporaneous with pit kiln 1 and that firing activities also occurred in several of those pit kilns prior to the construction of the house. The evidence is best for pit kiln 5 (14n36e), which contained somewhat more early pottery than the other three (see Table 7.8). Two other data points also are strongest for pit kiln 5 and indicate that it may have come into use sometime after pit kiln 1 but before the house was built: ¹⁴C dates from pit kiln 5 are slightly earlier than for pit kilns 2–4 (see chapter 4), and pit kiln 5 was impacted by the construction of pit kiln 3.

But, overall, the four other pit kilns had much higher quantities of later pottery than pit kiln 1, including G-35 vessels that date broadly to the Classic period. All four later pit kilns contained a range of Classic period gris jars and bowls, especially pit kilns 3 and 4. Wasters of some ceramic forms also were more frequently found in one pit kiln than in the others. For example, the highest quantities of gris bowl wasters were in pit kiln 3, whereas the highest

number of gris jar wasters were in pit kiln 4 (see Table 7.8). And most of the G-35 bowl and G-1 storage jar wasters that we collected were associated with pit kiln 4. These distributions are more likely to represent different firing events rather than sequential use of the features.

Clay concretions were recovered in and around all the pit kilns and were abundant in the midden deposits above the four later kilns. Yet there were fewer of them in pit kiln 4 (18n24e), especially given its size (see Table 7.8), and the midden directly above it compared to the others (see Figure 7.28). It is possible that the last firing activities occurred in that pit kiln, so that more of its temporary roofing was scattered around the feature. That pit kiln also may have been used more often to fire vessels in an oxidizing atmosphere with a less substantial temporary roof, more like the open, aboveground firing in the modern village of San Marcos Tlapazola, where potters still make a range of café vessels, including comals. Indeed, we recovered more café *sahumadors* from pit kiln 4 than from any other firing feature, although these incense burners were recovered from all kilns. In addition, pit kiln 4 had a smaller proportion of gris vessels (see Table 7.8), which would have required a more substantial roof to fire in a reducing atmosphere. Only pit kiln 1 had more café jars than pit kiln 4. The high number of café comals that we recovered from pit kiln 3 indicates that feature was often used to make the tortilla griddles, but there also were high numbers of comals in pit kiln 4. In addition, figurine fragments and wasters were recovered from all the kilns, but the most wasters came from pit kilns 3 and 4. Based on the ceramic assemblages in each feature, all the pit kilns were used to make both reduced gris and oxidized café vessels.

In sum, a range of vessel forms, both reduced graywares and oxidized cafés, were fired in each pit kiln. The earliest feature, pit kiln 1, was covered over by the residence, while the others continued in use (possibly pit kiln 5) or were constructed in association with the residence. The later kilns do not appear to have been used sequentially, but rather were in use at the same time, often used for firing different vessel forms.

7.7. Classic Period Figurines and the Ejutla Assemblage

The Ejutla figurine assemblage is very large compared to the other domestic contexts that we excavated in the Valley of Oaxaca. The 2005 figurines and fragments from one house and surrounding middens and kilns greatly surpass the quantities at El Palmillo (total of 1168 figurines divided among eight houses and other public areas) and the Mitla Fortress (562 divided among three houses). At Lambityeco we recovered 3870 figurines and whistles associated with a residence, temple, plaza area, and ballcourt. This large assemblage is less comparable for several reasons; the figurines were mostly recovered from a civic-ceremonial area instead of just domestic contexts. More than half of the ceramic figurines at Lambityeco are large whistles that

were likely used in public, as opposed to domestic, rituals (see Appendix 4). Although we did not find evidence of ceramic production during our Lambityeco excavations, which only exposed a small part of the site, pottery production was documented as an important economic activity at the site in earlier excavations (Lind and Urcid 2010; Payne 1970; Peterson 1976). Most of the figurines at Lambityeco were likely made nearby but not within the area of our excavations.

The high quantity of figurines, many of them wasters, and the presence of many figurine molds are evidence that the Ejutla potters crafted figurines in a variety of forms and representations, almost entirely in café paste (95.2%). Figurines and wasters were present throughout the excavations in almost all contexts. The highest quantities (>55%) were in the middens around and above the house and pit kilns, followed by the fill under the house (~20%). There were few in the house (~5%). They were found in all the pit kilns, accounting for approximately 18% of all figurines. Pit kiln 1 had the fewest figurines, whereas pit kiln 3 had twice as many as any other kiln (see Table 7.8).

But the anomalous nature of the Ejutla figurine assemblage beyond the evidence of production did not become clear to us until we excavated at other sites in the valley and rarely found the most common Ejutla forms of female and warrior figurines (Feinman and Nicholas 2019b). Here we describe the figurine assemblage in Ejutla in some detail and return to the larger implications for interregional interaction and exchange in the concluding section (7.8) of this chapter.

Close to 80% of the figurines were mold-made, and approximately 14% were modeled by hand. Other figurine fragments were too indistinct or deteriorated to determine the method of production. The modeled ones at Ejutla are small solid figurines that mostly represent humans (usually of indeterminate gender), but a few are animals, typically dogs, birds, and bats (Figure 7.29, animals are in the bottom row). The torsos of the modeled figurines are crudely formed and lack details. The eyes and mouth on the heads may be marked by simple punctations or small coffee bean appliques. Modeled figurines were made as early as the Formative period in the Valley of Oaxaca, but



Figure 7.29. Small modeled figurines are mostly anthropomorphic, but some represent animals (bottom row).



Figure 7.30. Finger impressions on the back of a warrior figurine head.

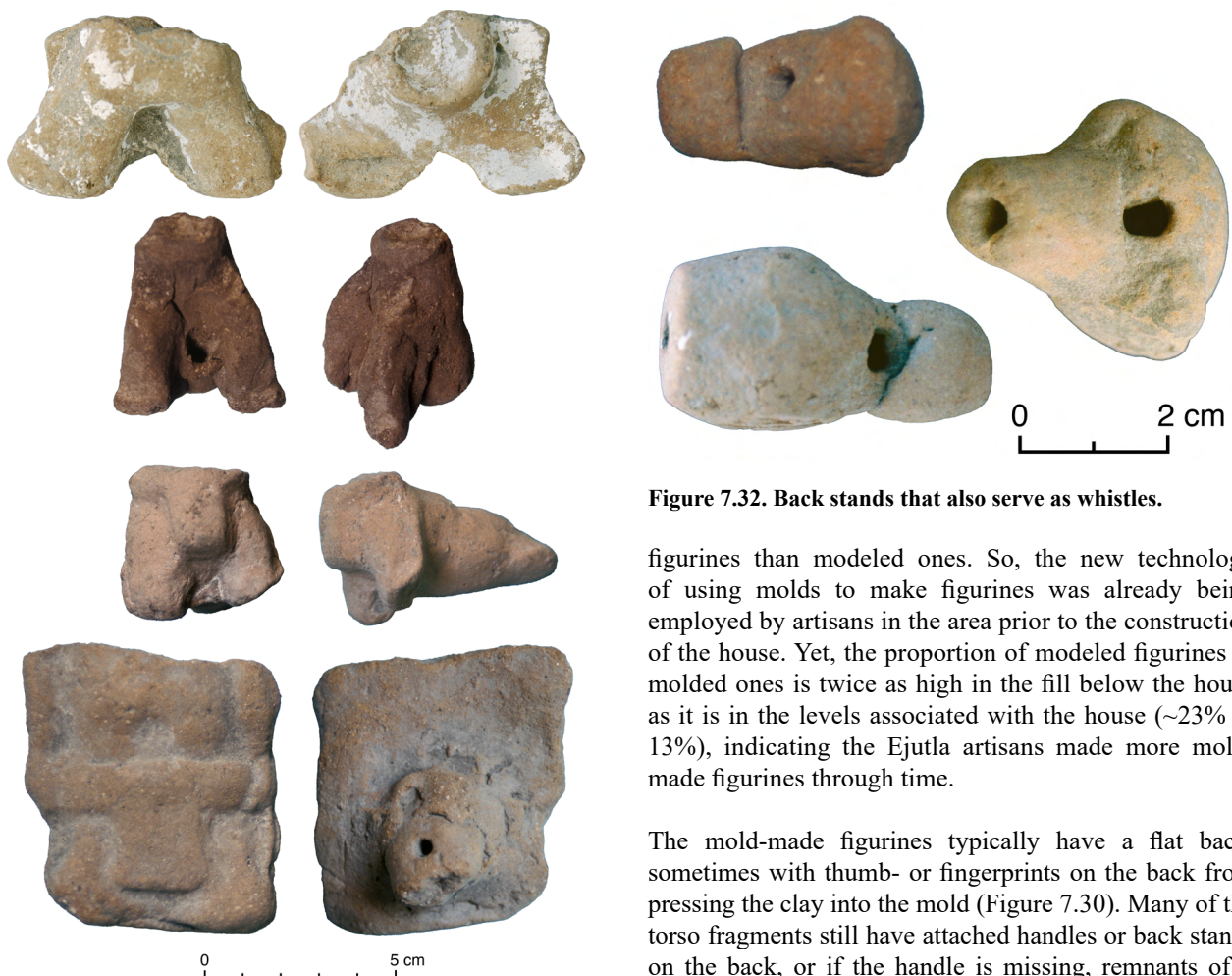


Figure 7.31. Figurine torsos (on the left) with remnant and complete back stands (on the right).

they continued to be made, even if in lower quantities, during the Classic period when artisans began using molds to make figurines (e.g., Feinman 2018). Modeled and molded figurines were recovered from all five pit kilns, and even in pit kiln 1 there were more molded



Figure 7.32. Back stands that also serve as whistles.

figurines than modeled ones. So, the new technology of using molds to make figurines was already being employed by artisans in the area prior to the construction of the house. Yet, the proportion of modeled figurines to molded ones is twice as high in the fill below the house as it is in the levels associated with the house (~23% to 13%), indicating the Ejutla artisans made more mold-made figurines through time.

The mold-made figurines typically have a flat back, sometimes with thumb- or fingerprints on the back from pressing the clay into the mold (Figure 7.30). Many of the torso fragments still have attached handles or back stands on the back, or if the handle is missing, remnants of it are still visible on the back of the figurine (Figure 7.31). These back stands allow the figurines to be placed in standing positions; the back stands are hollow, with small blow holes so that the hollow cavity could also serve as a whistle (Figure 7.32).

Two varieties of female and warrior figurines are especially prevalent at Ejutla (Table 7.9; see also Table A4.1): females clothed in a plain garment and *quechquémitl*

Table 7.9. The Ejutla figurine assemblage.

Figurine categories	Total no. of figurines	No. of wasters
Female #1 (braided headdress)	217	17
braided headdress	54	7
decorated triangular tunic	24	2
plain banded tunic	139	8
Female #2 (intricate headdress)	4	1
decorated tunic/garment/arms crossed	4	1
Female #3 (small crossed arms)	2	–
triangular tunic/braided headdress	2	–
Indeterminate	429	70
Indeterminate anthropomorph	633	75
head	93	13
indeterminate	529	61
statuary	8	–
headdress	1	–
torso	1	–
neck/torso	1	1
Male/warrior	417	35
cotton armor	58	6
feathered cape	9	–
feathered hood	50	4
helmet/turban headgear	108	8
loincloth	128	12
plain jacket	13	–
priest	39	5
tiered hood	12	–
Miniature anthropomorph	110	3
miniature warrior	20	1
miniature indeterminate	9	–
small modeled figure	81	2
Modeled animal	91	8
bird	24	2
dog	13	2
other animal	54	4
Whistle (globular)	52	6
bird/owl/bat headdress	4	–
<i>fauces de serpiente</i>	10	–
feathered headdress	7	1
jaguar headdress	2	1
serpent head	3	–
whistle base	4	1
whistle head	22	3
Whistle (small)	50	–
buccal whistle	1	–
feathered headdress	37	–
whistle base	12	–
Total	2005	215

(tunic) (Figure A4.3c) and warriors wearing a loincloth, usually undecorated (Figure A4.7h). Most of the female heads have a braided headdress; most of the warrior heads sport a helmet or turban-like headgear. These varieties were recovered from all the later pit kilns, although with greater frequencies in pit kiln 3. Only a few loincloth fragments and one braided headdress were found in pit kiln 1, but there were many heads and bodies of both the female and the warrior in the fill below the house, so they were also being made in the area prior to the construction of the house.

Several variations of the females and warriors at Ejutla appear to have been made with the same set of molds, although we did not find any complete torso molds for these figurines. But one complete full-body figurine mold (see section 7.1, Figure 7.17) is almost a perfect match for a small warrior figurine that we collected. Overall, though, small molded figurines are only a small subset (<2%) of the figurine assemblage at Ejutla, mostly anthropomorphic (Figure 7.33, see also Figure 7.17) but also representing dogs and felines (bottom row). A unique animal figurine befitting the prevalence of turtle in the faunal assemblage was molded into a hollow turtle shell (top left).

The most notable characteristic of the most common female figurines at Ejutla (Table 7.9, female #1 in Appendix 4) is the lack of decoration beyond a beaded necklace. The female wears a plain triangular tunic, or

quechquémitl, over a long garment; the tunic is edged by an undecorated border, and the garment often has a basal band at the bottom; the bands may vary in width but do not have any decoration (Figure 7.34, Figure 7.35). In most cases, the arms are down at the sides of the figure, although a few have extended arms. A less common variation of this figure has two bands defining the edge of the tunic and two basal bands on the garment, and in another variation, the tunic is not triangular but has a rounded or angular bottom (Figure 7.36). The arms are often extended on these females, but a subset have their arms on their chest under a plain cape-like garment. When a necklace is present, it usually consists of a single strand of beads, although a few have double strands. A smaller set of female figurines have a decorated band on the tunic (Figure 7.37).

We found fewer corresponding heads relative to bodies, although the most complete and detailed mold that we found, in pit kiln 4, was a complete head with a double-strand braid (see Figure 7.16). A number of the heads we collected are similar to the mold, but none was a perfect match (Figure 7.38). In general, there is more variation in the headdresses than in the garments, with some having extra embellishments in the braid (Figure 7.39). We did not recover enough molded flat-back figurines that retained at least part of the head with the torso to tie specific headdresses to specific garments. And a high proportion of the figurine heads are broken facial fragments (Figure 7.40).



Figure 7.33. Small molded figurines, both anthropomorphic (top and center) and various animals (bottom), including a turtle shell (top left).



Figure 7.34. The most common female figurine variant at Ejutla, female #1 wearing a plain banded garment and triangular quechquémitl.



Figure 7.35. Other plainly dressed variants of female figurine #1.

The most common warrior at Ejutla wears only a loincloth, often with a simple necklace or neck ornament (see Table 7.9, third male variant in Appendix 4); the arms are generally down at the side of the figure, although in some variants the arms are raised or crossed on the chest. Most often the loincloth is plain (Figure 7.41), but some warriors wear a decorated loincloth and a more elaborate neck ornament (Figure 7.42). A smaller subset of warriors wear short garments above loincloths, both of which are decorated, and they typically have flexed arms and hold a shield and/or staff (Figure 7.43); the shields are often decorated. Another figurine variety that is more common at Ejutla than the other sites we excavated is an individual wearing a pleated skirt and holding an orb in his hands that is resting on the abdomen (Figure 7.44, fifth male variant in Appendix 4). These figurines are similar to a skirt-wearing male portrayed in select ceramic effigy vessels from the

Late Classic period in the Valley of Oaxaca that has been associated with the supernatural Xipe Totec (Scott 1993; Sellen 2003). Generally small numbers of male figurines that also appear to be priests are present at the other sites, yet they tend to be different in kind, as they wear long capes (see Figure A4.8a–b).

Although less common than warriors with loincloths, some warrior figurines at Ejutla also wear cotton armor, often holding shields and staffs (Figure 7.45, see Table 7.9, first male variant in Appendix 4). Warriors wearing cotton armor are found much more widely across the Valley of Oaxaca than are warriors wearing loincloths like those at Ejutla (see Table A4.1). Only in Miahuatlán to the south are loincloths also more common (Brockington 1973, 36, 41; Markman 1981, 155). The lower frequency of figurine warriors with cotton armor is curious, as cotton could have



Figure 7.36. Variants of female figurine #1 wearing a double-banded garment and quechquémitl (top left), rounded quechquémitl (top right and second row), double strand necklace (rows 3 and 4), and with arms crossed or resting on chest (bottom row).



Figure 7.37. Variants of female figurine #1 wearing a decorated garment and quechquémitl.

been grown and seemingly was spun proportionately more frequently at these sites in the southern sector of the valley, certainly compared to sites in the drier eastern arm.

Like the torsos, the warrior heads at Ejutla show more variability than the female heads (Table 7.9, see warrior headgear in Appendix 4). Most wear a helmet, which may be plain, braided, or decorated (Figure 7.46). Also common are helmets with large medallions above the forehead or headgear that looks like a court jester (Figure 7.47). Other warriors have hooded or feathered headdresses, often with a tuft of feathers or other extension on top (Figure 7.48). The headgear on many warriors at Ejutla, especially feathered headdresses, is commonly represented on warriors at other sites in the valley. In contrast, the medallion and court jester helmets, like the warriors wearing only loincloths, are not. It is possible that these heads and torsos are from the same figurines, but there are no complete warriors in the figurine assemblage to support this supposition.

Other classes of figurines that are prevalent in Tlacolula, such as females wearing highly decorated garments and

elaborate headdresses (female #2, Figure A4.5), smaller females with arms crossed on their chests (female #3, Figure A4.6), warriors in feathered capes (Figure A4.7e–g), and small modeled dogs (Figure A4.1) are present in very low quantities at Ejutla (see Table A4.1). Only at Lambityeco are large whistles the most dominant variety (Figure A4.10), although we collected dozens of fragments at Ejutla. These other figurines may not have been made by the Ejutla potters, but that cannot be ruled out given the presence of several wasters for some of these figurine varieties (see Table 7.9).

7.8. Ceramic Production: Synthesizing Lines of Evidence

In sum, we have presented multiple lines of evidence that the occupants of the excavated house made pottery and distributed their vessels through networks that were mostly local. Based on abundance, compositional analyses, tools of manufacture, defective products of various kinds, and the firing features themselves, we have marshaled evidence for specialized ceramic production. And all of that evidence comes from artifacts and features found



Figure 7.38. Figurine heads wearing braided headdresses.

adjacent to (and sometimes intermixed with) a domestic structure and the activities associated with it.

The Ejutla potters produced a range of utilitarian vessels including comals (tortilla griddles) and *sahumadors* (incense burners), ceramic objects such as spindle whorls for use in other economic activities (spinning), and ceramic mold-made figurines for communal and domestic rituals. The utilitarian ceramic vessels were made mostly for immediate household (or *barrio*) use, at the same time that the Ejutla artisans made figurines both for themselves and neighboring households and also for exchange to other communities in the area. The most common figurine

varieties made at Ejutla (female #1 wearing a plain banded garment, see Figure 7.34, and the third male variant wearing only a loincloth, see Figure 7.41) are rare at sites in the Tlacolula arm of the valley (see Table A4.1), but they are not rare in the Ejutla Valley, where we recorded nearly identical forms during the regional survey (see Figure 7.21). One of the figurines from a site approximately 10 km from Ejutla is a compositional match to similar figurines from our excavations (Carpenter and Feinman 1999; Feinman 1999), as noted in section 7.1. Similar simply dressed females and warriors in loincloths are also more common in the Miahuatlán Valley to the south (Brockington 1973, 36, 41; Markman 1981, plate 13). Whether or not



Figure 7.39. Other braided headdress variants.

they were made in Ejutla, they circulated in a different interaction network in the southern part of the Central Valleys of Oaxaca. The spherical spindle whorls that are common at Ejutla are rare at El Palmillo, Lambityeco, and the Mitla Fortress in the eastern arm of the valley. Yet we found them at other sites near Ejutla during the regional survey. Along with molded figurines, they were made for exchange beyond the immediate household or barrio, at least to other communities in the Ejutla Valley.

But collectively, the Ejutla household was not devoted to ceramic production full-time, as shell working (discussed in chapter 8) and lapidary crafts (discussed in chapter 9) are also associated with the excavated structure. Following a

pattern noted at other sites in peripheral parts of the Valley of Oaxaca (Kowalewski 2003, 73), ceramic production at Ejutla was less standardized on one paste as compared to more central parts of the valley, where gris pottery was more abundant compared to the plain café pottery at Ejutla (see Table 7.7). The use of pit kilns at Ejutla, with their ephemeral roofs that did not provide as much control as updraft kilns, is likely one factor, but there also may have been less competition or fewer market options than at the regional core (Feinman and Nicholas 2001b, 141–42).

We do not have broad-scale distribution studies for the Valley of Oaxaca like those for the Aztecs that show the exchange of goods from diverse locations in markets (e.g.,



Figure 7.40. Miscellaneous figurine heads and facial fragments.

Nichols et al. 2002). But in a trace element analysis of Classic period pottery, Leah Minc and colleagues (2015) documented the movement of pottery, mostly utilitarian, in the Valley of Oaxaca. For example, as noted in section 7.2, a relatively high proportion of utilitarian pottery at El Palmillo (~18%) was produced at sites farther to the west in the central part of the Tlacolula Valley (closer to Lambityeco). We also noted that the nicer, molded spindle whorls at high-status residences at El Palmillo are similar to those at Lambityeco (where there was ceramic production, though not in the contexts we excavated). Those whorls could have been made elsewhere at El Palmillo beyond the areas we excavated, but they also could have been made in Lambityeco and then traded to El Palmillo. In general pottery tended to move from west (where there are many more good clay sources) to east in the Valley of Oaxaca.

Even today, in the Valley of Oaxaca, most of the pottery production that still occurs is carried out in communities to the west (Santa María Atzompa, San Bartolo Coyotepec). Pottery from these communities is exchanged through markets and middlemen and consumed by domestic units in the eastern part of the valley. Although materials from our excavations at the Ejutla site were not included in that study (Minc et al. 2015), pottery made from raw clay sources sampled from the southern valley/Ejutla zone was traded north to Jalieza, closer to the center of the Valley of Oaxaca. It may be that the Ejutla artisans made ceramic items for exchange not only to other sites in the Ejutla Valley but also to areas somewhat farther north. As we discuss in chapter 8 (shell production) and chapter 9 (tools of production), sourced obsidian from Ejutla and other sites in Oaxaca provides additional support for the broad-scale



Figure 7.41. Warriors wearing plain loincloths.

movement and exchange of goods from producers to consumers in Classic period Oaxaca. The twentieth- and twenty-first-century importance of domestic production and markets for the people of the Valley of Oaxaca likely has deep historical roots (Feinman and Nicholas 2010, 2012, 2021; Kowalewski 2012).



Figure 7.42. Warriors wearing decorated loincloths.



Figure 7.43. Warriors wearing decorated garments.



Figure 7.44. Priests wearing skirted garments, often holding a circular object on their abdomen, and priest wearing cape (bottom right).



Figure 7.45. Warriors wearing cotton armor.

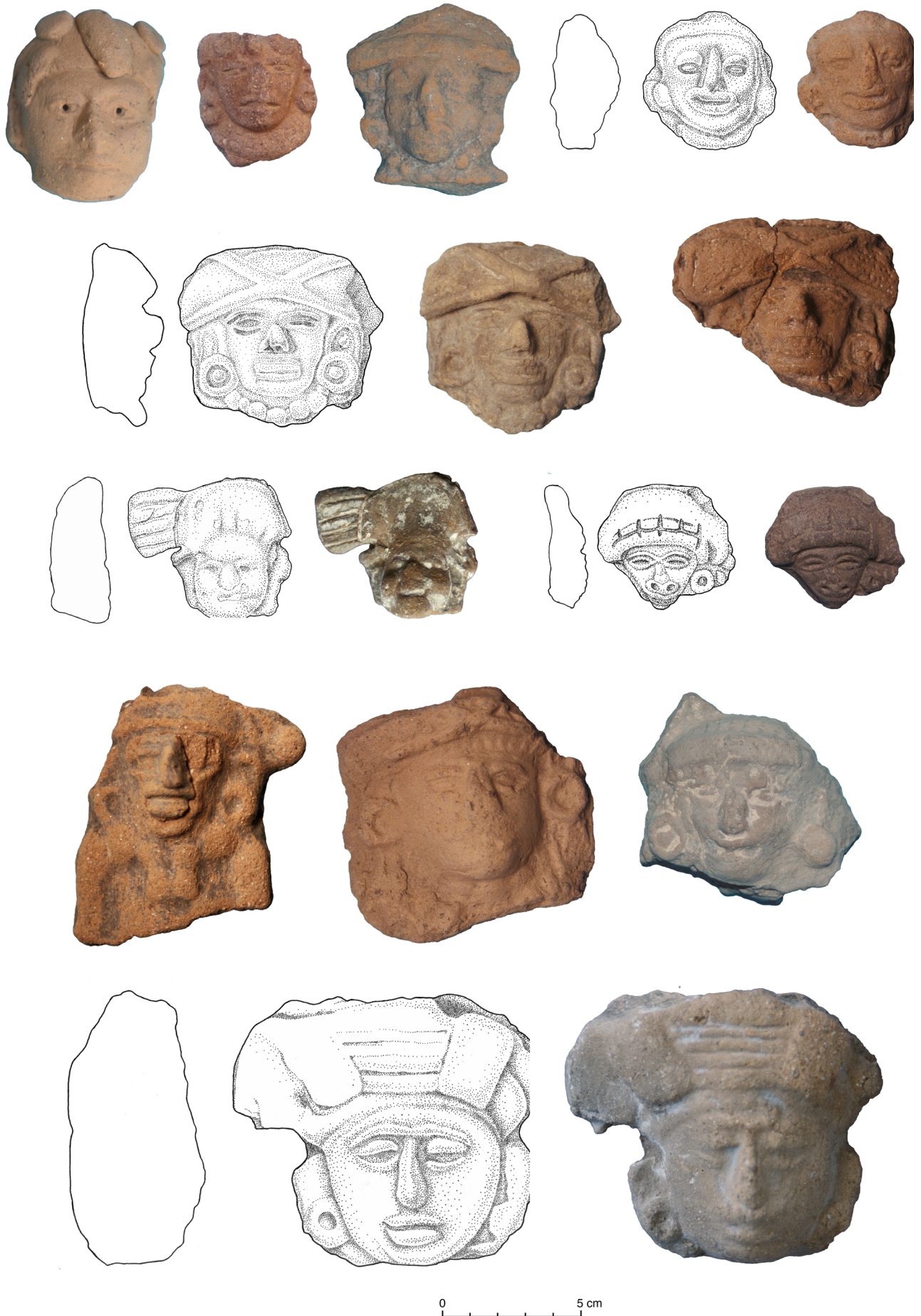


Figure 7.46. Warriors wearing a variety of helmets.



Figure 7.47. Warriors wearing headgear with medallions and baubles.



Figure 7.48. Warriors wearing hoods and feathered headdresses.

Shell Ornament Production and Routes of Exchange

Marine shell was highly valued in prehispanic Mesoamerica and was fashioned into a variety of ornaments with great symbolic importance. Shells were traded widely and were often deposited in high-status contexts (e.g., Borhegyi 1966; Coe 1959; Feinman 2001; Inomata and Emery 2014; Kidder 1947; Kolb 1987; Miller 1986; Moholy-Nagy 1985, 1994a, 1994b, 2008; Velázquez Castro and Melgar Tísoc 2021). One of those special contexts is Monte Albán's spectacular Tomb 7 in the landlocked Valley of Oaxaca (Caso 1932, 1969). The tomb is famous for its Late Postclassic assemblage of gold and jade objects, yet among the more than 500 exotic ornaments in the tomb were necklaces made of hundreds of shell beads, especially red ones crafted from the spiny oyster (*Spondylus*). Other necklaces made of small whole shells were used to adorn breast pieces of jaguar skin. There were ornamental shell bracelets, earspools, small mother of pearl plaques (primarily *Pinctada mazatlanica*) that were used in mosaics, and perforated shells that served as eyes in mosaics of turquoise. A conch-shell trumpet was one of the offerings left above the crypt after a reopening of the tomb (Marcus 1983b), which was originally constructed late in the Classic period.

Earlier during the Classic period, when the South Platform on Monte Albán's Main Plaza was dedicated, stone boxes with almost identical offerings were placed beneath at least three of the building's corners; each box contained a necklace of 7 jade beads, but the principal components were marine shells—5 large and 5 small spiny oysters (*Spondylus*) and 10 tent olive (*Oliva*) shells (Acosta 1958–59, 27). At Teotihuacan, in Central Mexico, Pacific Coast *Spondylus* shells were frequently deposited in caches and offerings (Kolb 1987, 90–91; Séjourné 1966, lámina 47), including Classic period offerings of spiny oysters and jade beads similar to those on the South Platform at Monte Albán (Marcus 1983c, 2009a, 97). Finished shell objects reported from other excavated contexts in the Valley of Oaxaca were also found principally in dedicatory offerings and funerary contexts (e.g., Bernal 1953; Bernal and Gamio 1974; Flannery 1983c; Gallegos Ruiz 1978; Paddock 1955). At El Palmillo, a child buried on a lower terrace was interred with an artificial, ceramic snail shell (Feinman and Nicholas 2009). These finds attest to the symbolic importance that the prehispanic inhabitants of the Valley of Oaxaca, and Mesoamerica more generally, gave to shell. *Spondylus* was especially valued; unworked shells have been found in dedicatory contexts not only in Oaxaca and Central Mexico but also across Mesoamerica (e.g., Coe 1959; Moholy-Nagy 1994a, 1994b; Turner 2022, 270). In addition to being a valued commodity, at Spanish contact, shell was one of several media that was, at certain

times and places, used as currency in Mesoamerica and elsewhere in the Americas (Boekelman 1935; Gamble 2020; Paris 2021; Tozzer 1941). *Spondylus* was especially valued as a currency among the Maya (Freidel et al. 2016, 18). Shell and other materials appear to have taken on monetary functions in marketplace exchanges, at least among the Maya, as early as the Classic period (Baron 2018; Freidel et al. 2002, 2016; Paris 2021, 11).

Marine shell has generally and traditionally been recovered by Mesoamerican archaeologists as whole pieces or finished ornaments from special contexts. In a large-scale study, Lourdes Suárez Díez (1977, 1981) analyzed more than 20,000 shell objects recovered from salvage excavations of burials at 19 sites along the Balsas River in Guerrero and developed a detailed typology of prehispanic shell objects, including preferred species, and the techniques used in their manufacture. These are important volumes on prehispanic shell from Mesoamerica, but the shells in the analysis were found in dispersed funerary contexts and none were from a clear production context. At the time we began our study in Ejutla, relatively little was known about the range of prehispanic Mesoamerican marine shell ornaments that were produced, the species used to make specific ornaments, or the scale and context of the production activities. Who were the artisans, where did they work, what range of items did they make, and who were the intended consumers of their products?

Marine shell was imported and worked into ornaments in the Valley of Oaxaca as early as the Early Formative period (Flannery and Marcus 2005, 78–81; Flannery and Winter 1976; Pires-Ferreira 1975, 1976; Winter 1972). In the 1970s, Kent Flannery and Joyce Marcus documented shell working at San José Mogote, one of six Formative period villages that were excavated as part of Flannery's Prehistory and Human Ecology of the Valley of Oaxaca research program. San José Mogote was only one of two villages (the other is Tierras Largas) where extensively excavated houses contained areas of 1–2 m² littered with flint chips, chert knives and drills, fragments of cut and discarded shell, and shell ornament fragments that were broken in the process of manufacture, in addition to complete ornaments (Flannery and Winter 1976, 39). Shell working was most evident in two houses at San José Mogote (see Flannery and Marcus 2005, 184–95, 314–34). Only intact shell ornaments were recovered from the other Formative villages (Pires-Ferreira 1976, 315). Most of the shell was from the Pacific Coast, but a significant minority was imported from Atlantic drainage, freshwater riverine contexts. Pacific Coast pearl oyster (*Pinctada mazatlanica*) and spiny oyster (*Spondylus*) were the most