10

Fisherman, Farmer, Rich Man, Poor Man, Weaver, *Parcialidad* Chief?

Household Archaeology at Cerro la Virgen, a Chimú Town within the Hinterland of Chan Chan

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For several centuries, the Chimú town of Cerro la Virgen lay in the rural sustaining area of Chan Chan (Figure 10.1), the capital of the Chimú Empire (AD 1000–1460) on the north coast of Peru (Campana 2006; Keatinge and Day 1973; Moseley and Day 1982; Moore and Mackey 2008; Ravines 1980). Cerro la Virgen has long been viewed as a community whose primary purpose was the provisioning of Chan Chan, an urban center with a population of 20,000 to 50,000 people (Topic and Moseley 1985), and the political economy of the empire (Keatinge 1974, 1975). The settlement covers 14 ha and originally consisted of hundreds of large masonry-and-*quincha* household compounds clustered along the Great Northern Road, which connected Chan Chan to the Chicama Valley (Figure 10.2).

In the latter part of the Late Intermediate Period (LIP, AD 1000–1470) and Late Horizon (LH, AD 1470–1532), Cerro la Virgen was probably the third-largest settlement in the Moche Valley and the only significant settlement on the three-pampa area (Pampas Esperanza, Milagro, and Huanchaco). The site lies just 6 km from the urban core of Chan Chan at the terminus of a vast complex of relic fields that covered much of the three pampas. These fields were reclaimed during the peak of Chimú power (Moseley and Deeds 1982; T. Pozorski 1987). They were watered by the Vinchansao Canal, a massive labor project possibly completed in the AD 1200s, which originated 30 km inland in the foothills of the Andes (Moseley and Deeds 1982; Ortloff et al. 1983; T. Pozorski 1987). Cerro la Virgen also lies a short 3 km

Figure 10.1. Map of the Moche Valley with relevant sites (*provided by the authors*).

Figure 10.2. Plan map of architectural compounds at Cerro la Virgen (provided by the authors).

walk from Huanchaco Bay, one of the main sources of nearshore marine resources for valley residents from at least 1500 BC through the Colonial era (Briceño and Billman 2008; S. Pozorski 1976, 1979, 1982; Prieto 2014, and this volume).

The strategic location of Cerro la Virgen and the timing of its occupation raise several intriguing questions about the role that site residents played in the political economy of the Chimú Empire. Was the site a forced labor colony of farmers, tasked with provisioning royal households and their attached craft specialists at Chan Chan, as suggested by Keatinge (1975)? Were the site occupants craft specialists, spinning and weaving for the Chimú Empire (S. Pozorski 1982)? Or might they have been a *parcialidad* of fishing families, as ethnohistoric models suggest (Cock 1986; Netherly 1977, 1984, 1990; Ramírez 1996)? Here we critically examine the role that households at Cerro la Virgen played in the provisioning of Chan Chan through the analysis of emergency household midden excavations at the site (the excavations at Cerro la Virgen were an "emergency" response to the destruction of the site due to illegal quarry operations). We present new data from these excavations in order to revisit older models about the site's occupation.

Results indicate a long period of continuous occupation of the site from the Middle Chimú Phase through the "Inca" Period (late LIP and LH, respectively). It was probably abandoned before the founding of Trujillo in 1535; no colonial artifacts or Old World domesticates have been found at the site.[1] We argue that the households studied were not made up of specialists, but rather reflected a mixed economic strategy that combined fishing, farming, and crafting. These households were largely self-sufficient, except for one key resource: water for their fields. The fields used by the residents were likely dependent on the Vinchansao Canal. Previous analysis of the water demands of irrigation in the valley indicates that farming on the three-pampa area could not have been sustained without the allocation of water by a central authority (Billman 2002). Consequently, although the households at Cerro la Virgen were self-sufficient in most respects, they were dependent on a higher politically authority for their most basic need: water.

History of Previous Investigations

In 1969, Richard Keatinge and Shelia Pozorski (then Griffis) conducted mapping and household and midden excavations at Cerro la Virgen, in

order to understand the roles that the site played in the provisioning of Chan Chan (Griffis 1971; Keatinge 1975). They concluded that the site was a state-sponsored settlement; in their view, the community was forcibly relocated to Cerro la Virgen in order to farm adjacent Chimú state fields. They proposed that surplus from agricultural fields was shipped by llama to Chan Chan in order to provision royal households and their attached craft specialists. Community members also fished and collected shellfish for their own use. Based on the results of her analysis of midden excavations, Pozorski concluded that most of the meat consumed at Chan Chan was from camelids, rather than fish and shellfish. Parting ways from Keatinge, she argued that the main activity of the site was the production of cotton and textiles for Chan Chan (Griffis 1971; S. Pozorski 1976, 1979, 1982).

Keatinge and Pozorski present compelling arguments in support of their interpretation of the function of Cerro la Virgen that have been widely accepted by regional scholars (for example, Moore and Mackey 2008). Until our emergency excavations, no other investigations had been conducted at the site and their interpretations have remained unquestioned. Although their research methods were laudable, as is often the case with pioneering efforts, the passage of time has revealed limitations. Not all the excavations were screened, and the midden excavation was screened through ¼-inch mesh. Further, Shelia Pozorski used a unique method of analysis of food remains that estimated the volume of dietary reconstruction, rendering comparative use of her data problematic.

In order to reexamine their conclusions, we employed ⅛-inch screening in combination with systematic collection of samples for fine dry-sieving from all proveniences excavated. We used quantitative measures consistent with current standards, including NISP, MNI, bone weight, ubiquity, and density (Hastorf and Popper 1988; Lyman 1994; Reitz and Shackley 2012; Reitz and Wing 2008; VanDerwarker and Peres 2010). With the passage of more than 40 years and the development of new field and analytical techniques, the time has come to revisit Keatinge and Pozorski's interpretations and to explore alternative explanations.

Ethnohistoric and Archaeological Models of Coastal Households

Ethnohistoric documents provide excellent sources for understanding Chimú and "Inca" communities on the north coast of Peru. Many of these sources indicate that a network of patron-client relationships existed

between leaders and commoners during the reign of the Chimú Empire (Cock 1986; Netherly 1977, 1984, 1990; Ramírez 1996: 42–97; Rostworowski 1975, 1977). Known as *señores*, *curacas*, *caciques*, or *principales* in ethnohistoric documents, these leaders were arrayed in a political hierarchy ranging from local lords to kings. Each *curaca* controlled a group of families (or *parcialidad*) and specific resources (agricultural land and water, raw material sources, or fisheries). In exchange for protection and access to those resources, *parcialidad* households provided annual tribute payments in the form of goods and labor to a lord.

A key component of the *parcialidad* model is occupational specialization. Each *parcialidad* focused on a particular productive activity, such as farming, fishing, or crafting. Lords redistributed goods paid as tribute up and down the hierarchy of *parcialidades* (Netherly 1977, 1984, 1990; Ramírez 1996). In this way, crafters and fishing households were provisioned with agricultural produce and farmers, with craft goods and fish. Following a *parcialidad* model, the households at Cerro la Virgen might have been organized into one or more *parcialidades* that owed annual tribute to a lord. Further, each household would have specialized in fishing, crafting, or farming.

A confounding factor that makes the archaeological identification of *parcialidades* difficult is ethnohistoric evidence that *parcialidad* members might not always have lived together in compact, localized communities (Ramírez 1990, 1996). Court documents from the early Colonial Period provide an example of a lord who claimed authority over a *parcialidad* whose households were scattered across communities, in several different resource zones from the coast to the sierra. Ramírez proposes that this pattern of *parcialidad* dispersal existed on the north coast in the Chimú and "Inca" periods (Ramírez 1996; see also Netherly 1977, 1984, 1990). However, this dispersal of *parcialidad* members across several settlements may have developed in the Colonial Period as a result of mass migration, demographic collapse, and the fragmentation of traditional authority. That said, migration and conquest were also a part of the prehistoric world before the Spanish arrival. If this pattern of *parcialidad* dispersal existed prior to the Spanish occupation, it may have begun many generations before Spanish arrival during the "Inca" conquest, or even earlier during the reorganization of the north coast by Chimú lords between AD 1200 and 1460.

In contrast to the *parcialidad* model, Moseley and colleagues proposed that Chimú communities paid their tribute in labor, rather than in goods (Hastings and Moseley 1975; Moseley 1975; Moseley and Day 1982). They

apply what is essentially an "Inca" model of *mita* taxation to the Chimú Empire, that is, a form of *corvée* labor tax in which each family sent one member to work in state fields for several months each year. *Parcialidades* are not mentioned in their reconstructions of Chimú taxation. A system of Chimú *corvée* labor tax is supported by their analysis of large tracts of relic fields on Pampa Mocan and Quebrada del Oso in the Chicama Valley and on the three-pampa area in the Moche Valley. Absent from these fields were contemporary habitation sites, with the exception of Cerro la Virgen. Rather, state facilities such as compounds with *audiencias* were present (*audiencias* were U-shaped chambers used for Chimú bureaucratic functions) (Keatinge 1974, 1975). Further, relic fields were not divided into small individual plots but consisted of rows of continuous serpentine fields, similar to industrial monoculture (Kus 1973; Risco 2013). These fields have been interpreted as state fields, tilled by laborers paying *mita* (*corvée*) labor taxes (Day 1982; Keatinge 1974; Keatinge and Conrad 1983; Keatinge and Day 1973; Moseley and Day 1982).

Following this "Inca" *mita* model, Keatinge proposed that families were forcibly moved to Cerro la Virgen in order to work the state fields on the three pampas. The "Inca" forcibly resettled dissent groups far from their homelands in colonies known as *mitimae* settlements. Although Keatinge does not use the term *mitimae*, he appears to have had a similar idea in mind. In Keatinge's view, the households at Cerro la Virgen worked state fields on the three-pampa area; produce went directly into royal storerooms at Chan Chan to support Chimú royalty, both living and dead, their retainers, and attached specialists.

Testing these models of Chimú community and household organization, be it *parcialidad* or *mita*, requires rigorous definition of the material correlates of household specialization. Significant strides have been made in this area on the coast of Peru (for a review of literature see Sandweiss 1996). For example, Sandweiss compared commoner and elite fishing households at the "Inca" site of Lo Demás in the Chincha Valley. He found archaeological evidence of occupational specialization and status differentiation analogous to ethnohistoric records of hierarchy and household specialization on the south coast (Sandweiss 1992). Joyce Marcus tested models of fishing specialization derived from ethnohistoric and historic sources by analyzing faunal remains, artifact assemblages, and specialized structures, such as sand-filled rooms for storing dried anchovies and sardines, at Cerro Azul in the Cañete Valley during the LIP (Marcus 1987; Marcus et al. 1999). Her analysis indicated that a paramount elite household received

large quantities of fish as tribute from local fishing households. This tribute was stored in large sand-filled rooms within the paramount lord's domestic compound.

George Gumerman found evidence of three types of specialized households at Pacatnamu in the Jequetepeque Valley during the Chimú era: fisher, farmer, and noble households (Gumerman 1991; 2002). In contrast, Jerry Moore did not find evidence of household specialization in the barrios at Manchan, the southern provincial capital of the Chimú Empire (Mackey 1987; Moore 1981, 1985); rather, households were largely self-sufficient. In contrast, the nearby site of Quebrada Santa Cristina appears to have been a Chimú special-labor camp, established to construct ridge fields in the Casma Valley in the wake of an extreme El Niño event (Moore 1991). In sum, archaeological evidence indicates that there was considerable diversity in household economic strategies pursued throughout the Chimú Empire.

The aforementioned studies reveal important correlates of specialized farming, fishing, and crafting households. In the case of fully specialized fishing households, we would expect to find evidence of the full array of fishing tools, such as net fragments of various mesh size, net weights, cotton cordage, net gauges, gourds, and copper fishhooks. Evidence of farming tools and craft materials would be lacking. If fishing were oriented toward surplus production, then associated features (for example, drying racks, salting features, and sand-filled rooms or pits for desiccating small fish) should be present in or near household structures. Likewise, fish assemblages should be dominated by taxa that are well suited to feeding large populations or that lend themselves to preservation and transport.

Full-time crafting households should contain abundant evidence of crafting tools, raw materials, and crafting by-products. Weaving would be indicated by raw cotton, materials for dyes, spindle whorls, and loom pieces such as flattened batons of bone or wood. Absent would be evidence of farming tools and fishing gear. Dietary remains would be dominated by storable staples, such as beans and corn kernels, received in trade or from state storerooms. Further, invasive weeds, which were inadvertently carried to the fields by farmers and thrived there, would be absent, as specialized crafting and fishing families would not have worked fields. These invasive species ride on clothing and camelid fur from field to home, and sometimes they are gathered to supplement domesticated foods (for example, see Cowan and Watson 1992; Gumerman 1991, 2002; Moore 1991).

In contrast, specialized farming households that produced surplus foodstuffs for other specialists and received craft goods and fish in exchange via the state system should be characterized by abundant evidence of the processing of domesticated plants and the presence of fresh fruits and weedy field species, along with agricultural tools and storage pits or storerooms. Evidence of fishing tools and craft materials would be lacking. Instead, stone or metal hoe tips, digging sticks, digging stick weights, and clod breakers would be common, as would by-products from the processing of plants, such as pods and husks. Invasive weeds found in fields also would be common.

Cerro la Virgen Midden Samples

In the 1980s, Cerro la Virgen was designated a *zona intangible* by the Instituto Nacional de Cultura (INC), now Ministerio de Cultura, in order to protect the site. The boundaries of the site were mapped, marked by concrete cairns, and recorded on the *Registro Publico*. The site was largely undamaged until illegal gravel quarrying began in 2006. Multiple interventions by the INC and MOCHE, Inc., have slowed the pace of destructive quarrying; however, despite their best efforts, 1 ha, or 7 percent, of the site has been destroyed by quarrying. We report here on the emergency excavation of two middens in danger of collapsing into the open-pit quarry, which is 10 to 20 m deep. Quarrying subsequently destroyed what remained of one of these middens.

The ongoing destruction of Cerro la Virgen is particularly lamentable because hyperarid conditions have resulted in remarkable preservation. Even by the high standards of coastal Peru, the cultural deposits are remarkably well preserved. Remains recovered from the two middens included desiccated plants (gourd fragments, leaves, seeds, husks, spines, cotton bolls, raw cotton, cane, and twigs), textiles, fishnets, fishing line, reed mats, basket fragments, rope, wood tools, pelts, fur, human hair, feathers, fish bones and scales, otoliths, insects, human and nonhuman coprolites (camelids, dogs, and guinea pigs) and copper tools, ornaments, and smithing slag.

Furthermore, stratigraphic layers remain remarkably well defined. Quarrying exposed a 150 m long profile of the site, with continuous cultural deposits exposed along the top of the massive quarry cut. The result is an extraordinarily detailed profile of cultural activity, albeit accessible only by 10 to 20 m scaffolding. The site apparently never experienced perturbation

by rodents, burrowing insects, or destructive geologic processes. The prehistoric human residents of the site likewise did little damage to the stratigraphy, evidently content to allow domestic refuse to accumulate across the site as well as in mounds. *Quincha* structures with masonry foundations were rebuilt many times, resulting in layers of superimposed floors, rubble, and trash. On the coast of Peru, infestation by termites and dry rot typically force the abandonment of *quincha* structures in fewer than 15 years (Moore 1985; Moore and Gasco 1990). The result is stratigraphy of stunning detail and clarity, filled with daunting quantities and varieties of desiccated organic remains and artifacts, as well as hearths, storage pits, superimposed floors, walls, and domestic middens.

Description of Excavations

Most of Cerro la Virgen is covered by agglutinated compounds (see Figure 10.2), defined by low masonry walls that originally formed the foundations for *quincha* walls. Alleyways and subtle breaks in architecture may indicate neighborhoods within the site. On the edges of compound clusters and at the end of alleys are low mounds formed from the accumulation of household refuse. Emergency excavations directed by Billman and Briceño focused on two midden mounds on the edge of the quarry pit (Figure 10.3), located 60 m apart on the north and south ends of a cluster of domestic compounds. This compound cluster originally may have formed a discrete neighborhood within the community; thus, our excavations likely sampled domestic trash from opposite ends of the same neighborhood. Shelia Pozorski's midden cut lies on the edge of a different neighborhood, approximately 110 m southeast of our excavations (Griffis 1971).

In order to sample the endangered middens, a one 1 by 2 m unit was placed on each midden (henceforth referred to as XU 17 and 18). Excavations were conducted by cultural levels and all material was passed through ⅛-inch screens. The volume of excavated material from each level was measured by counting 10 L buckets. All screen residuals were collected and sorted with the goal of 100 percent recovery of cultural material greater than ⅛ inch in size. Because of the extraordinary density and diversity of organic material, each hour of excavation required as much as four hours of sorting. Five-liter samples also were collected from each level and from features, such as pits, floor, and hearths, for finer dry-sieving, which will be processed in future analyses.

The quarry cut at XU 17 revealed approximately 2 m of cultural deposits, consisting of more than 20 layers of dark trash. No features or structures were observed in the cut, indicating that the area was used only for trash disposal. Due to time constraints, we did not reach the bottom of the midden in XU 17, but the quarry profile suggests we came within 20–30 cm of sterile deposits. We excavated 880 L of cultural deposits in XU 17.

The XU 18 midden originally consisted of a low mound, approximately 1.5 m in height and perhaps 5 m in diameter. Quarrying between 2006 and 2009 destroyed approximately 80 percent of this midden. In 2013, further quarry activity created an "island" measuring 7 by 14 m and towering two to three stories above the floor of the quarry pit; the remnant midden was situated on the edge of this island (see Figure 10.3). No masonry foundations were visible on the surface of the island; however, the presence of numerous floors and walls in the profile indicated that domestic compounds had once covered the area during the early occupation of the site (Figure 10.4). Later in the occupation, the area was converted to a trash dump for a cluster of compounds located a few meters to the south. We excavated 1,011.5 L of cultural deposits but were unable to reach the base of the cultural deposit due to time constraints. In 2014 quarrying destroyed the entire island.

Summary of the Analysis of Artifacts and Ecofacts

Our analysis focused on materials recovered from ⅛-inch screening. We recognize that some plant taxa with small seeds and faunal remains (for example, fish vertebrae) smaller than ⅛ inch were likely overlooked in this analysis. Because of the excellent preservation and abundance of organic remains recovered from screen mesh, however, we are confident that the taxa discussed here comprise a substantial portion of the resources used by the site's inhabitants. Bulk 5 L soil samples will be analyzed at a later date. Plant, fish, and invertebrate remains were identified to the lowest possible taxonomic level using local comparative collections, a vertebrate photo archive assembled by Hudson, the USDA pictorial website (U.S. Department of Agriculture 2013), and standard reference manuals (for example, Aguilar et al. 2013; Altamirano 1983; Cannon 1987; Coan and Valentich-Scott 2012; Cooper and Schiller 1975; Martin and Barkley 1961; Olsen 1964, 1968, 1972; Pacheco Torres et al. 1986; Wheeler and Jones 1989).[1]

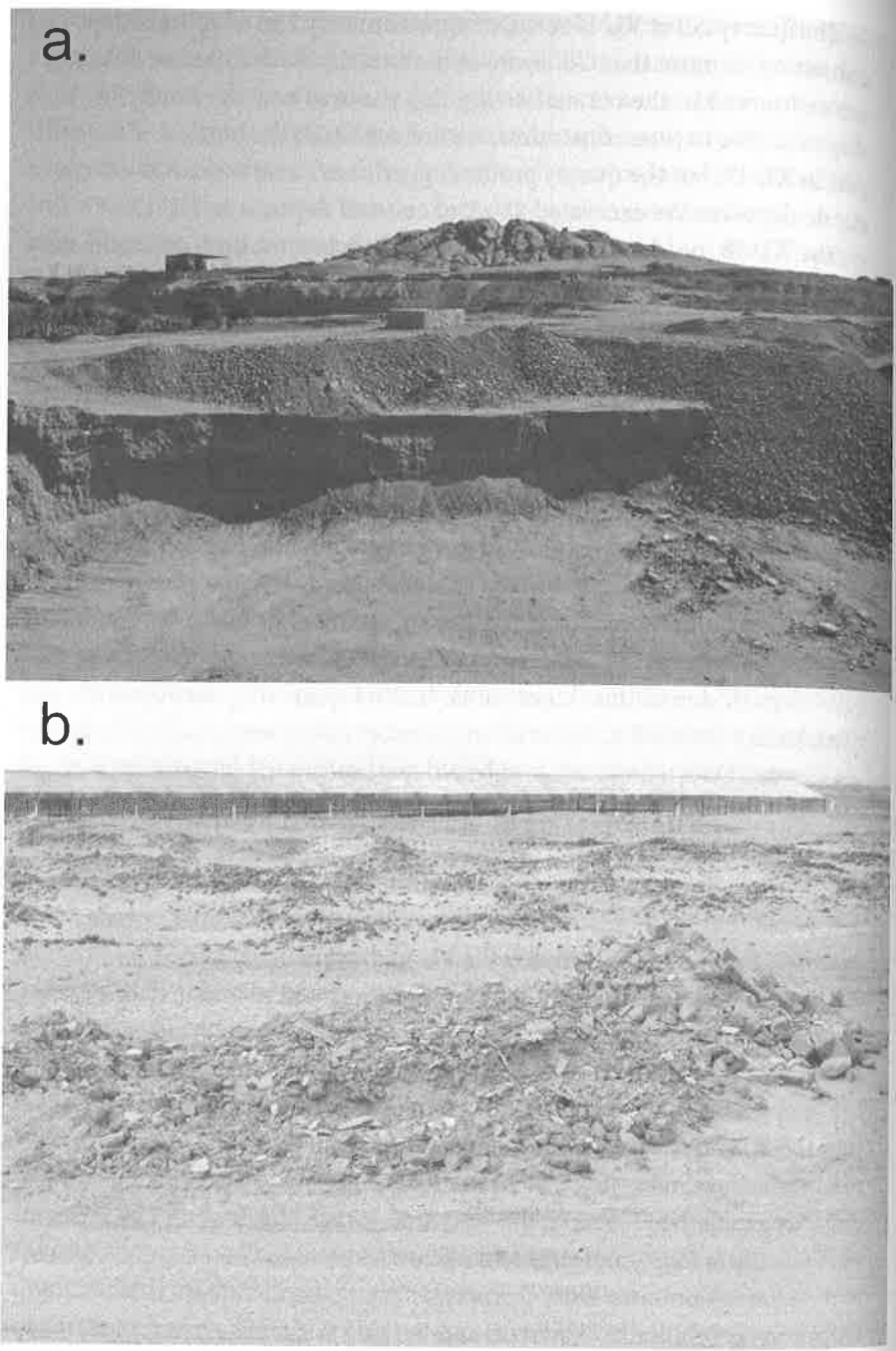

Figure 10.3. (*a*) Photo of the "island" created by illegal quarrying at Cerro la Virgen; and (*b*) the location of the XU18 midden (provided by the authors).

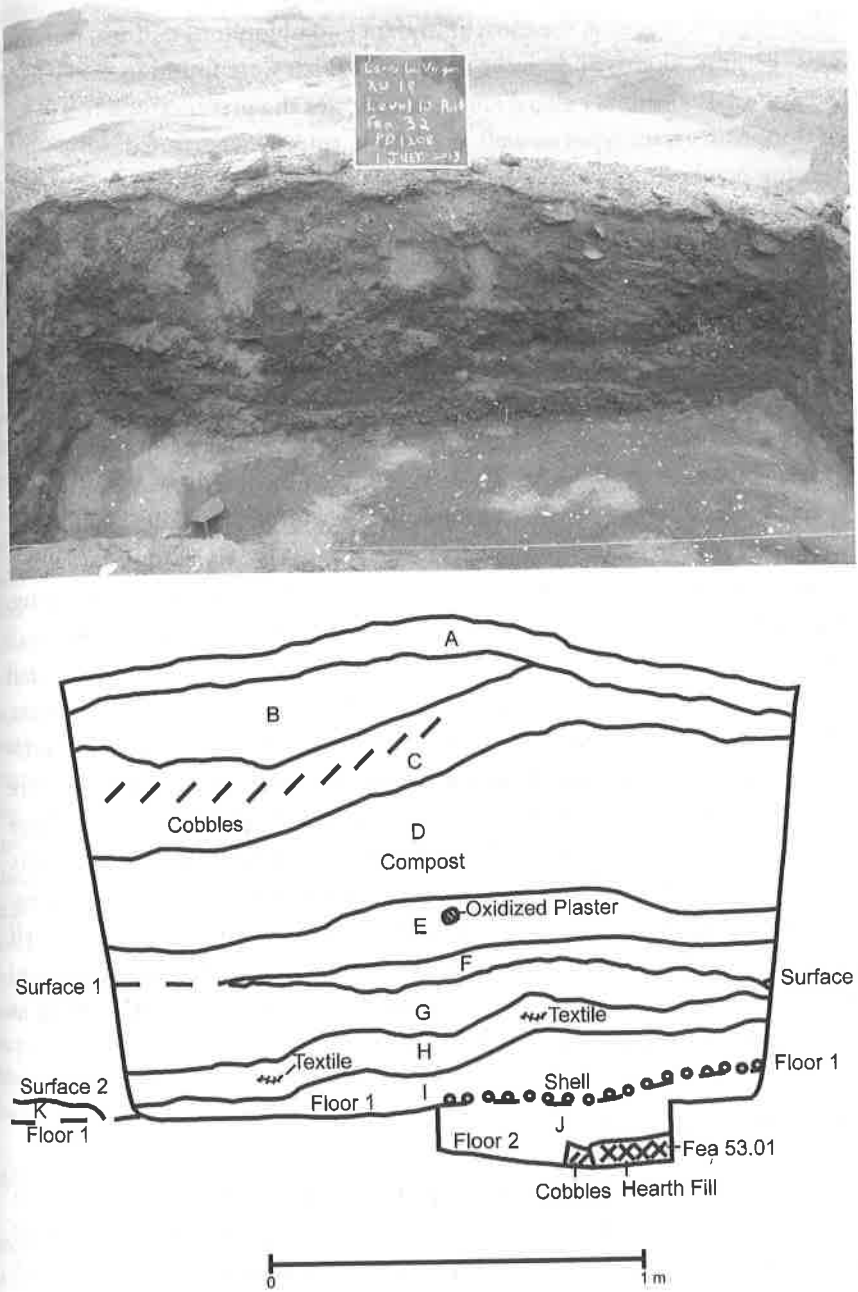

Figure 10.4. Photo and profile drawing of XU18 (individual stratigraphic levels indicated in profile drawing) (provided by the authors).

The Artifact Assemblage

After organic material, the most abundant and ubiquitous cultural remains were ceramic sherds and pieces of textile, which were found in every level excavated. Preliminary sherd analysis indicates the presence of a full range of domestic vessel types as well as ceramic spindle whorls. Cooking *ollas*, serving bowls, long-necked jars of various sizes for liquid storage (possibly *chicha*), and large water jugs were represented in the assemblage. Textiles consisted of undecorated cloth, string, yarn, fishing line, and nets. Small numbers of wood and metal artifacts, along with stone beads, were found during our investigations and those conducted by Keatinge and Pozorski (Griffis 1971, Keatinge 1974, S. Pozorski 1976, 1982). The only wood artifacts found in the two units were carved corks; however, near XU 17, at the base of the quarry cut in redeposited midden, a figurine and loom pieces were found. Metal artifacts recovered from the site included net weights, net spacers, beads, other ornaments, spindle whorls, pins, needles, fishhooks, small pieces of sheet metal, and small amounts of slag (Johnson et al. 2016). Most of the metal tools were associated with textile production and fishing. The metal artifacts recovered are copper or arsenical copper with small amounts of impurities, such as iron and lead (Johnson et al. 2016). Small amounts of smithing slag were recovered from the midden assemblages, possibly indicating household-level production and repair of metal artifacts similar to those documented at Manchan (Johnson et al. 2016; Moore 1981, 1985). Lithic artifacts were rare, consisting of split cobbles and large utilized flakes made from cobbles from the bed of the adjacent Rio Seco. Hammerstones and grinding stones also are present in the midden samples. The assemblage of artifacts is indicative of daily domestic activities as well as fishing, farming, and crafting. This clustering of diverse occupational tools and debris in middens argues against occupational specialization at the level of community or neighborhood.

Botanical Remains

The extraordinarily well-preserved plant remains from Cerro la Virgen provide important information about cultivation, arboriculture, and wild plant collection strategies. Bardolph examined botanical remains from XU 18 to assess the relative importance of different plant resources at the site using ubiquity, density, and standardized counts (Table 10.1). These measures reduce biases due to differential preservation and sampling (Godwin

Table 10.1a. Inventory and summary quantification of plants identified at Cerro la Virgen (XU 18)

Common Name	Spanish Common Name	Scientific Name	Count
MAIZE			
Maize kernel	Maíz	*Zea mays*	1,086
Maize cob/cob frags			106
Maize (summed)			1,192
OTHER CULTIGENS			
Bottle gourd	Mate	*Lagenaria siceraria*	12
Canavalia bean	Pallar de gentiles	*Canavalia* sp.	2
Chili pepper	Ají	*Capsicum* sp.	481
Coca		*Erythroxylum novogranatense* var. truxillense	18
Common Bean	Frijól	*Phaseolus vulgaris*	13
Cotton (seeds)	Algodón	*Gossypium barbadense*	43
Lima bean	Frijól pallar	*Phaseolus lunatus*	1
Peanut (legume)	Maní	*Arachis hypogaea*	9
Peanut (shell)			2
Squash	Zapallo	*Cucurbita moschata*	36
Tepary bean		*Phaseolus acutifolius*	4
FRUITS			
Andean raspberry	Mora	*Rubus glaucus*	20
Avocado	Palta	*Persea americana*	15
Caigua		*Cyclanthera pedata*	5
Cansaboca		*Bunchosia armeniaca*	9
Lúcuma		*Pouteria lucuma*	106
Pacae	Guaba	*Inga feuillei*	10
Soursop	Guanabana	*Annona muricata*	292
Walnut	Nogál	*Juglands neotropica*	8
WILD RESOURCES			
Cheno/Am		*Chenopodium/Amaranthus* sp.	2
Fabaceae Family		Fabaceae	2
Grass	Gramalote	*Panicum* sp.	8
Mesquite	Espino	*Acacia macracantha*	1162
Saltbush		*Atriplex* sp.	
Solanaceae Family		*Solanaceae*	12
Unidentified seed/seed fragments			117
Samples analyzed (n)	14		
Total soil volume excavated (l)	1,011.5		
Total plant weight (g)	1,355.0		
Total wood/cane/achupalla weight (g)	750.0		

XU 18 Unit excavated at Cerro la Virgen.

(*continued*)

Table 10.1b. Plant ubiquity, density measures, and standardized counts (top 8 taxa) (*continued from Table 10.1a*)

Taxonomy	Category	Ubiquity	Density	Std. Count
Soursop/Guanabana	Fruit	100.0	0.3	0.5
Mesquite/Espino	Wild resource	100.0	1.1	1.9
Saltbush	Wild resource	90.9	0.2	0.3
Maize/Maíz	Cultigen	90.9	1.3	0.8
Lúcuma	Fruit	81.8	0.1	0.2
Chili pepper/Ají	Cultigen	72.7	0.5	0.6
Cotton/Algodón	Cultigen	72.7	0.05	0.1
Walnut/Nogál	Fruit	63.6	0.01	0.02

Compiled by authors.

1956; Hubbard 1975, 1976, 1980; Scarry 1986; Willcox 1974). Of a total plant weight of 1355 g, 750 g are represented by wood, *caña brava* (*Gynerium sagittatum*), or *achupalla* (*Tillandsia purpurea*), a rootless, epiphytic plant native to the desert region (Table 10.1). Wood charcoal and *achupalla* are excellent fuel sources, and cane likely served a variety of construction purposes.[2] A total of 24 other taxonomic categories were identified, including maize (*Zea mays*), other cultigens, wild and domesticated tree fruits, and other wild resources (see Table 10.1).

Maize has the highest density of all taxa of plants recovered and is also highly ubiquitous (it was present in 90 percent of the 14 levels analyzed). Maize also has the highest standardized count of all cultigens. Both cobs and kernels were recovered, indicating that families were processing maize at the site rather than receiving shelled maize. Chili pepper, or ají (*Capsicum* sp.), is the second densest taxon at the site, a pattern mirrored in the standardized counts. Other cultigens recovered include various beans, peanuts (*Arachis hypogaea*), gourds (*Lagenaria siceraria*), squash (*Cucurbita moschata*), and small amounts of coca (*Erythroxylum novogranatense* var. *truxillense*) (see Table 10.1). Cotton seeds have a relatively high ubiquity value (found in 73 percent of the levels analyzed), but low density and low standardized counts compared to other taxa. However, the high ubiquity of cotton seeds as well as raw cotton fibers indicates that the site residents engaged in cotton production. Indeed, all stages of cotton production are present at Cerro la Virgen; spindle whorls (ceramic, metal, and wooden) and metal needles, along with wooden loom pieces and textile fragments were recovered from the midden deposits. Cotton bolls, leaves, and stems were recovered, in addition to seeds.

The Cerro la Virgen assemblage provides a unique opportunity to examine the contribution of various fruits to the diet. Fruits rarely preserve in carbonized assemblages but are well represented among the desiccated macrobotanical remains from Cerro la Virgen (see Table 10.1). The most abundant tree fruits were guanabana (*Annona muricata*), lúcuma (*Pouteria lucuma*), and pacae (*Inga feuillei*). Shelia Pozorski (1976) noted the high frequency of guanabana at Cerro la Virgen as well as in the artisan sector (SIAR) of Chan Chan (S. Pozorski 1976, 1980, 1982). This fruit appears to have been an important resource during Chimú times, as evidenced by its ubiquity in other Chimú assemblages (Bonavia et al. 2004; Cutright 2015; Gumerman 1991; Moore 1981; Prieto 2011; S. Pozorski 1980; S. Pozorski and T. Pozorski 1997). Valued for its sweet white pulp, guanabana has been considered a "dessert fruit" (T. Pozorski and S. Pozorski 1997: 236). In addition to fruit consumption, lúcuma and pacae hardwoods were likely used to manufacture wooden domestic tools (Moutarde 2008: 303).

Mesquite, or *algarrobo* (*Prosopsis pallida*) dominates the wild resources recovered, although these trees may have been semidomesticated. Mesquite trees grow quickly and are long-lived; their hard woods are a source of long-burning firewood and charcoal. The beanlike fruit can be used for camelid fodder, ground into flour, or used to make *chicha*. Several other wild plants were identified in the assemblage as well; some of these species may have had economic uses (for example, matting/thatching or as camelid fodder), whereas others likely were unintentionally transported to the site on the clothing of family members and fur of camelids returning from agricultural fields.

In sum, the botanical evidence indicates that the site residents practiced broad-based strategies of field cultivation, arboriculture, and wild plant collection. The proximity to irrigation canals and fields suggests the importance of farming, and the variety of cultigens further supports this inference. A focus on farming, particularly for tribute or labor-based models, tends to obscure the importance of other forms of plant husbandry that exist alongside field agriculture, including small-scale gardening and tree orchard management. Indeed, tropical systems of gardening and arboriculture often surpass field cultivation in terms of time and labor investments (Dunning and Beach 2000; Peters 2000).

Shelia Pozorski (Griffis 1971: 62) argued that fruits were secondary in importance at Cerro la Virgen because they would have been "accessory foods," that is, condiments rather than basic staples. Wild species were third in importance to cultigens and fruits, as they would have been incidentally

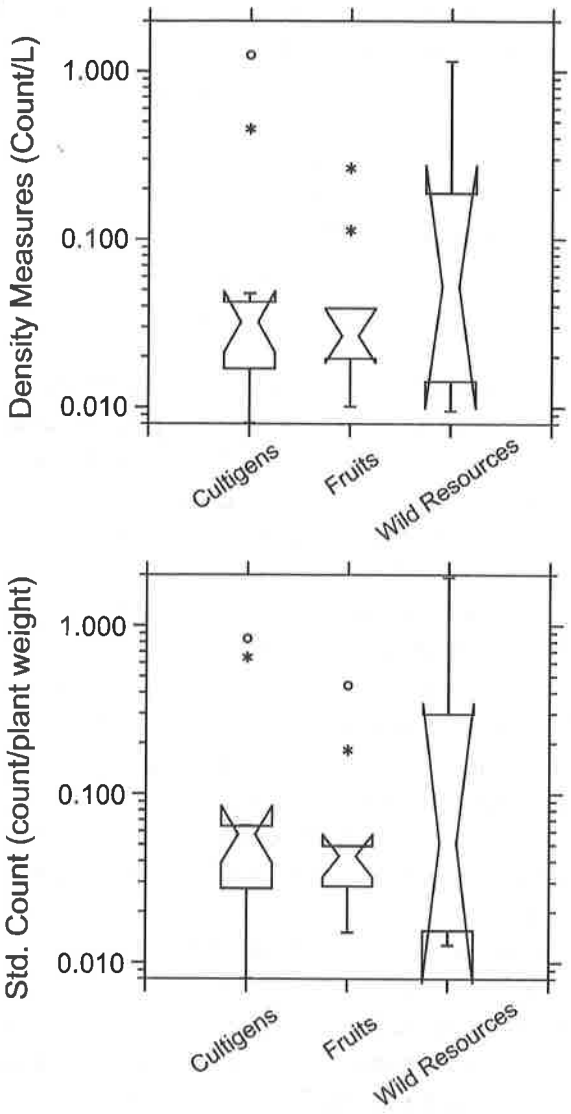

Figure 10.5. Box plots of densities and standardized counts of plant remains by category (provided by the authors).

gathered and used sparingly. However, a comparison of density measures and standardized counts via box plots (Figure 10.5) suggests that the site residents were not in fact relying on cultigens more than fruits, or even wild resources. Indeed, there are no significant differences between the three categories of plant foods as represented at Cerro la Virgen (the relative

importance of wild resources is likely inflated due to the abundance of mesquite recovered). Thus, there is ample evidence of the practice of both agriculture and arboriculture at Cerro la Virgen. A lack of rainfall on the arid coastal plain would have made an elaborate irrigation system essential.

Fruit trees, in addition to field crops, require large amounts of water year round. The water table is too deep on the pampa to sustain mature trees, even after extreme El Niño events (see discussion below). If the site residents were managing stands of fruit trees in addition to farming maize fields, then they must have had access to an abundant amount of water. Fruit trees were likely grown with sustained year-round irrigation, either in orchards or along canals (or both). This inference raises some intriguing possibilities. The intensive use of water from irrigation canals at Cerro la Virgen means that other communities in the Moche Valley would have had reduced access to water. Households at Cerro la Virgen appear to have been relatively autonomous in many ways, with broad-based strategies of field cultivation, arboriculture, and wild plant collection; however, they were dependent on a higher authority for water regulation.

Fruits from upper portions of the valley may have been exchanged for agricultural products produced by the site residents. However, the totality of the botanical evidence from the site indicates the creation of an anthropogenic landscape of orchards, cultivated and fallow fields, and mesquite groves sustained throughout the multigeneration occupation of the site. Such a landscape could have been created and sustained only by regular application of irrigation water.

Vertebrate Faunal Remains

The examination of zooarchaeological remains from Cerro la Virgen focuses on differences in the animal classes exploited. Hudson analyzed vertebrate remains from XU 17 and XU 18. One of the most striking patterns in both middens is the dominance of fish among the vertebrate remains, both across the samples and throughout the site's occupation (Table 10.2). Fish account for over 90 percent of the bone NISP in every level where the bone count was greater than one. This pattern is equally true of both excavation units, suggesting great consistency over time and among/between the households represented. As noted earlier, the two units lie in middens at either end of a discrete cluster of household compounds that may have formed a neighborhood at the site. The abundance of fish bone, in combination with the presence of artifacts associated with fishing, such

Table 10.2. Vertebrate taxa identified at Cerro la Virgen

FISH
Cilus gilbert
Cynoscion analis
Galeichthys peruavianus
Merluccius gayi
Paralonchurus peruanus
Sardinops sagax
Sciaena deliciosa
Stellifer minor
Trachurus murphyi
Subclass *Elasmobranchii*
MAMMALS
Lama glama
Lontra feline
Otaria flavescens
Sigmodon sp.
BIRDS
Pelecanus thagus
Phalacrocorax sp.
REPTILES
Suborder *Lacertilia*
Suborder *Serpentes*

Compiled by authors.

NOTE:
This version of the hard copy of the publication had an editing error and did not include Table 10.2 in the form submitted by its author, Hudson.

The correct version has been spliced into this pdf, between pages 286 and 287.

The electronic version of the edited volume should have the correct table.

as net fragments and copper hooks, argues for the presence of active fishing families within this neighborhood at Cerro la Virgen.

Among the fish taxa represented, drums and croakers (family *Sciaenidae*) and sea catfish (family *Ariidae*) were the most common (Table 10.2). These taxa can be caught in nearshore habitats and are common in the catches of modern artisanal fishers in nearby Huanchaco, where they are caught with nets both directly from shore and from nearshore locations using reed boats, or *caballitos.* Drums and croakers can be taken with hook and line as well as nets. Observation and interviews with modern Huanchaco fishing families indicate that *Sciaenidae*, such as *lorna* (*Sciaena deliciosa*), are good for family meals, while sea catfish or *bagre* (*Galeichthys peruvianus*) are valued as bait fish for crab traps (Hudson 2011).

Other fish identified but relatively rare at Cerro la Virgen include sharks, rays, and other elasmobranchs (subclass *Elasmobranchii*) and offshore schooling fish, such as sardines (*Sardinops sagax*), jurel (*Trachurus*

Table 2. Inventory and Summary Quantification of Vertebrate Animals Identified at Cerro la Virgen (XU 17 and XU 18).

Scientific Name	Common Name	Local Name	NISP	Bone Weight (g)
FISH				
Family Sciaenidae	croakers & drums		82	18.26
- *Cilus gilberti*		*corvina*		
- *Cynoscion analis*		*cachema*		
- *Paralonchurus peruanus*		*suco*		
- *Sciaena deliciosa*		*lorna*		
- *Stellifer minor*		*mojarrilla*		
Family Ariidae	sea catfish		30	3.72
- *Galeichthys peruavianus*		*bagre*		
Family Merlucciidae	hake		5	.63
- *Merluccius gayi*		*merluza*		
Family Carangidae	mackerel		1	.03
- *Trachurus murphyi*		*jurel*		
Family Clupeidae	sardines & herrings		2	0.1
- *Sardinops sagax*		*sardina*		
Infraclass Teleostei - not further differentiated	bony fish, undifferentiated		4353	277.52
Subclass Elasmobranchii - not further differentiated	sharks & rays	*tollo y raya*	39	4.27
Fish - not further differentiated	unidentified fish		5386	286.84
SUBTOTAL – All Fish			**9898**	**591.37**
REPTILES				
Suborder Lacertilia	lizards		6	.29
Suborder Serpentes	snakes		2	.03
Reptiles - not further differentiated			13	.51
SUBTOTAL – All Reptiles			**21**	**.83**
BIRDS				
Family Pelecanidae			3	2.91
- *Pelecanus thagus*	Peruvian pelican	*pelicano*		
Family Phalacrocoracidae			2	4.12
- *Phalacrocorax bougainvillii*	Guanay cormorant	*guanay*		
Birds – not further differentiated			46	8.17
SUBTOTAL – All Birds			**51**	**15.20**

MAMMALS				
Family Camelidae			10	81.39
- *Lama glama*	llama	*llama*		
Family Otariidae			1	3.67
- *Otaria flavescens*	South American sea lion	*lobo marino*		
Large Mammal - not further differentiated			22	50.98
Order Carnivora			1	9.92
- *Lontra felina*	marine otter	*gato marino*		
Medium Mammal -not further differentiated			11	13.71
Order Rodentia			184	11.37
- *Sigmodon* spp.	cotton rat			
Small Mammal - not further differentiated			18	.92
Mammal - not further differentiated			20	9.98
SUBTOTAL – All Mammals			**267**	**181.94**
UNIDENTIFIED				
Vertebrate -not further differentiated			857	52.35
SUBTOTAL - Unidentified			**857**	**52.35**
GRAND TOTAL – All Bone			**11094**	**841.69**
SUBTOTAL **- Bone Identified to Class**			**10237**	**789.34**

murphyi), and merluza (*Merluccius gayi*). Offshore schooling fish are ideal for surplus production for trade or tribute because large numbers can be caught in a single fishing event using nets, and, in the case of the smaller-bodied sardines, are suitable for mass drying and transport. Given the proximity of Chan Chan, low quantities of such ideal surplus fish in these two middens is potentially informative about social relationships within and between Chimú communities. Although there is evidence of their capture, it was not on the scale needed if the goal was to provision Chan Chan. Over 90 percent of the fish remains identified to taxonomic family (NISP=120) at Cerro la Virgen represent nearshore habitats. This pattern is the opposite of data reported by Sandweiss (1992: 111) for the Inka site of Lo Demás, where fishing for surplus for tribute and trade resulted in almost 90 percent pelagic fish by NISP. The Lo Demás sample was dominated by small schooling fish (sardines and anchovies) even though screen recovery was ¼ inch. Although the Cerro la Virgen sample (recovered with ⅛-inch mesh) has a quantitative advantage for the recovery of such small-boned fish, these fish are relatively unimportant. In sum, the bulk of the fish remains recovered from domestic middens at Cerro la Virgen seem better suited to feeding local families. In addition, if schooling fish were being caught and processed for Chan Chan, then we might expect to find special purpose processing facilities, such as fish-processing work areas, drying racks, or sand-filled rooms for drying; to date, these have not been identified at Cerro la Virgen.

Camelids, likely llama (*Lama glama*), appear to be of secondary importance in terms of contribution to diet. Although the overall importance of large mammals appears very minor by NISP (representing 1 percent or less of the total bone in each unit), NISP does not capture the relative dietary contributions of large animals to the degree that bone weight does. Bone weight is a better proxy for relative dietary importance, as the weight of an animal's bones scales to the mass of the body it supports (Prange et al. 1979; Reitz et al. 1987). Fish remains were more important than those of large mammals, even when diet is a proxy for bone weight.

The middens do show some variation in camelid use. In XU 17, large mammals contribute only 8 percent of all bone weight, and the identified elements represented include low-utility body parts: a cranial fragment, tooth fragments, and a metapodial fragment. In contrast, in XU 18, large mammals contribute 34 percent of all bone weight and the elements represented include high-utility body parts such as vertebrae and ribs as well as low-utility elements such as teeth and ambiguous elements like limb shaft fragments. Although the total number of camelid bones is quite small, this

pattern hints at differences in household access to camelid meat, a question to pursue with a larger sample of households.

Sheila Pozorski suggested a different pattern of emphasis, in which domesticated llamas provided the bulk of animal protein in the diet (Griffis 1971; S. Pozorski 1976, 1979). Given the coarser mesh, ¼ inch, recovery techniques in practice at that time, screen size alone may account for the apparent lack of importance of fish in Pozorski's sample. Alternatively, the unique quantification technique she used may explain the lack of comparability. A third alternative is that Pozorski's sample may represent households that had better access to or preference for camelids (the midden area that Pozorski sampled appears to be part of a different neighborhood, located over 100 m to the south of our excavations). One surprising result is the absence of guinea pig vertebrate remains (genus *Cavia*) in our two units. However, guinea pig fur was recovered from the middens, and guinea pig bone was reported by Pozorski in her midden excavation (Griffis 1971; S. Pozorski 1976, 1979). Comparison between our samples and Pozorski's highlights the need for more interneighborhood as well as interhousehold research.

Invertebrate Remains

Bardolph analyzed invertebrate remains from units XU 17 and XU 18. The invertebrate data indicate that collection of shellfish at nearby sandy beaches was a regular activity of household members at Cerro la Virgen. Marine shellfish were both ubiquitous and abundant; shell was found in every level excavated, and densities were quite high. The samples yielded a total weight of 13.90 kg, of which 12.64 kg (90 percent of the assemblage) are represented by the small beach clam, *Donax obselulus* (Table 10.3). Donax clams contribute significantly more to the Cerro la Virgen invertebrate assemblage than any other resource. Principally found in shallow marine and brackish areas, these clams would have been easily harvested and served as an important food source. Site residents could have easily collected them from the shoreline of nearby sandy beaches, and steamed or boiled them in pots for soups or stews. The assemblage also is characterized by a relatively high density of tegula (*Tegula atra*) and green mussels (*Semimytilus algosus*), along with a variety of other shellfish, small crabs, and barnacles (see Table 10.3).

Shellfish and other invertebrate collection constituted an important economic activity at Cerro la Virgen. Some household members, likely women (see Prieto 2009), may have participated in shellfish collection along the

Table 10.3. Inventory of invertebrates identified at Cerro la Virgen

Scientific Name	Common Name	Weight (g)	Density (g/L)
Turitella cingulata	Sea Snail	0.6	0.001
Olivella sp.	Olive shell	13.4	0.013
Polinices uber	—	11.8	0.02
Fissurella peruviana	Keyhole Limpet	2.4	0.02
Anomura	Crab	33	0.025
Scutalus proteus	Land snail	27.6	0.027
Septifer sp.	Platform mussel	2.5	0.029
Nassarius wilsoni	Dog whelk	38.2	0.029
Stramonita haemastoma	Dog winkle	27.3	0.032
Balanus sp.	Barnacle	36.7	0.037
Xanthochorus buxea	—	67.2	0.051
Stramonita delessertiana	—	74.2	0.066
Sabellarididae	Kiso/"Piedra pomez"	83.5	0.103
Prisogaster niger	Turban snail	159.7	0.141
Semimytilus algosus	Mussel	221.3	0.218
Tegula atra	Tegula	306.4	0.234
Donax obesulus	Donax clam	12643.6	12.451
Unidentified		155.0	

Compiled by authors.
— Common name unknown.

beach at low tide. Collecting could have fit easily into family subsistence activities during low periods in labor demand, and when household members such as the elderly and children were not engaged in primary productive activities—a pattern widely documented ethnographically throughout the world (for example, Meehan 1982).

Discussion

What economic strategies did the Cerro la Virgen residents pursue? What role did they play in the regional economy and especially the political economy of the Chimú Empire? While much work remains to be done at the site, the household compounds and midden deposits excavated to date indicate a consistent pattern of household economy. Given the number of households that once lived at the site and the long occupation, we cannot exclude the possibly that some households pursued different strategies. However, among those households investigated, we can draw several conclusions, which can be the basis for further investigations.

Several lines of evidence clearly demonstrate that households at the site included farmers who tilled the fields near the town. The ubiquity, abundance, and diversity of cultigens demonstrate that domesticated plants were the primary source of calories for household members. Residents had access to both storable staples such as maize, ají, and beans, and a wide variety of fresh fruits. Further, all parts of the corn plant were present in trash deposits, including kernels, cobs, husks, and stalks. Likewise cotton bolls and seeds were common. These lines of evidence suggest that families were processing plants at the household level, rather than receiving processed, dry foodstuffs from *curacas* or through trade. Agricultural tools recovered, including wooden digging sticks and stone weights and clod breakers, support this assumption as well. Finally, the ubiquity of field invaders, including grasses and other invasive weeds, indicates that families were working fields and intentionally or unintentionally bringing weedy species back to their homes.

The abundance and ubiquity of fruits and mesquite indicate that farmers had sustained access to irrigation water from the Vinchansao Canal throughout the long occupation of Cerro la Virgen. The result was the creation of an anthropogenic landscape of cultivated fields, orchards, mesquite groves, and fallow pastures. Neither mesquite nor fruit trees can grow on the three-pampa area without irrigation water because of the low water table and hyperarid conditions. Bringing fruit trees to maturation requires at least several years of regular, year-round watering, and, once mature, trees must be watered several times a year. Unlike other areas in the Moche Valley and adjacent valleys, the water table is extremely deep on the pampas, ranging from 100 m to several hundred meters (even after heavy El Niño rains), and the roots of mesquite and fruit trees are not sufficiently deep to tap groundwater. No mesquite trees are found outside of irrigated fields anywhere on the pampa today; neither are there any on Google imagery or historic aerial photos dating back to 1942. In addition, due to the topographic setting of the pampas, rainfall is absent except during strong El Niño events. In the middle Moche Valley and elsewhere, mesquite groves are sustained by several centimeters of annual rainfall as well as a high water table.

Fishing was an important part of the household economy of site residents. In contrast to Shelia Pozorski's earlier interpretations, fish, rather than llama, likely supplied the bulk of the protein consumed by at least some families at the site. Fish bones and fishing gear are abundant. Fishing activities do not appear to have been focused on schooling fish that would

have been suitable for supplying the urban population at Chan Chan. Rather, the common targets were nearshore fish such as drums, grunts, croakers, and sea catfish. This pattern is consistent with a degree of household-level autonomy in faunal procurement.

The role of camelids remains an important question. Camelid bones are present at the site consistently but in small numbers. This pattern suggests that camelid meat was a regular but minor part of the diet. Both high and low food utility elements are present at the site, suggesting access to whole carcasses. The ubiquity and occasional high density of camelid dung at the site supports the presence of living animals. The activities of modern smallhold farmers in the middle Moche Valley provide some insights into the possible role of llamas at Cerro la Virgen. Burros and mules are now an essential part of farming small plots; daily rental rates for a burro, used for transport and for manure, are actually higher than the daily rate for unskilled farm laborers. Llamas may have held similar roles as beasts of burden for farmers at Cerro la Virgen (see Prieto 2009: 288–289). Llamas could have grazed in fallow fields and seasonally on the slopes of Cerro Campana, which has large areas of *lomas*. Although healthy llamas may have been too valuable to eat, old or infirm animals could have been culled for meat. Consequently, we suspect that small numbers of llamas were raised by households at Cerro la Virgen for use in farming.

One of the striking features of Cerro la Virgen is the quantity of textiles. Nearly every provenience excavated contained textiles, netting, yarn, or string, and hundreds of pieces of cotton cloth hang from the profile of the quarry cut. Decorated textiles are rare in the Cerro la Virgen assemblage; nearly all recovered textiles were plain white or brown cloth. Our limited excavations, as well as those of Pozorski and Keatinge, provide abundant evidence of textile production at the site. All stages of textile production are represented in the assemblages. Cotton bolls, seeds, raw cotton, yarn, and finished textiles are common in our excavations. Additionally, we recovered many spindle whorls, needles, and one set of loom pieces. Clearly, households at Cerro la Virgen wove textiles; whether they produced a surplus is unclear.

Site residents do not appear to have participated in large-scale craft production. To date, no evidence of ceramic production, such as wasters, tools, molds, or kilns, has been found at the site. However, as only a small portion of the site has been investigated, we cannot definitively state that pottery was not produced there. A working hypothesis based on limited evidence is that households received pottery through trade or by redistribution by

curacas. Remarkably, no evidence of Chimú ceramic production has been found to date anywhere in the Moche Valley. In contrast to pottery, metal workshops have been found at Chan Chan (Topic 1977, 1982). John Topic proposes that there were neighborhoods of metal smiths at Chan Chan that produced goods for the royalty and nobility. At Cerro la Virgen, we recovered a small amount of smithing slag, indicating that perhaps some households were producing small quantities of metal tools. Whether or not they also received additional tools or metal from Chan Chan is unclear.

In sum, evidence indicates that the households investigated to date pursued a mixed strategy of farming, fishing, weaving, and perhaps limited herding. Rather than specialists, these households were largely self-sufficient with regard to food production. One likely scenario is that some household members focused on farming while other members fished near the shore in Huanchaco Bay. Household members also ginned cotton, spun yarn, and wove plain textiles for clothing and fishing gear. Underemployed members of the household, such as children and elderly people, may have tended the household's few llamas and collected shellfish. The practical efforts of foodways may have been collaborative among extended families, with division of labor by age and sex, as is common today among Huanchaco fishing families (Hudson 2011). Based on our surface mapping and Keatinge's household excavations (Keatinge 1974), household compounds were relatively large at Cerro la Virgen, which is consistent with occupations by large extended families whose members pursue diverse tasks.

Although largely self-sufficient, the households at Cerro la Virgen likely depended on a higher authority for access to water. Our analysis indicates that they received a steady supply of water from the Vinchansao Canal. Construction of the Vinchansao Canal was beyond the labor of the households in the community, and central regulation was required to make sure that their fields received water (Billman 2002; Moseley and Deeds 1982; T. Pozorski 1987). Furthermore, the founding of Cerro la Virgen on the blank slate of the pampa, probably as a part of a massive regional reclamation project, suggests that households were moved to the site for the specific purpose of working agricultural fields. The leaders of the Chimú Empire would not have provided irrigation water (and land on the pampas) without receiving tribute payments in return. Households may have paid "rent" for the usufruct rights to fields and water. These tribute payments were likely in the form of either labor or a percentage of the harvest. Textiles may have formed part of payments as well.

The location of Cerro la Virgen adjacent to new farmland created by a large state-sponsored reclamation project, and the necessity of its reliance on state-managed irrigation, demonstrate the power of the Chimú state. However, the mix of fishing, farming, and crafting tools and debris at the household and neighborhood level demonstrates a simultaneous degree of relative autonomy and self-reliance in many aspects of daily life. Water linked these rural households to the state but daily life does not appear to have been micromanaged. There is a lack of evidence for forced labor, for occupational specialization, and for surplus production. While fields and water rights likely pertained to reciprocal agreements between lords and their subjects, the variety of economic resources at the site suggests less centralized political involvement in the community than has previously been interpreted by other researchers. Future research may clarify the nature of this dynamic.

We offer these interpretations with one significant caveat. Our work, and the work of Keatinge and Pozorski, was limited in area extent and distribution. Collectively, these projects have exposed only small windows in large neighborhoods. At this point, our knowledge of variation within and between neighborhoods is limited. Although architectural survey and mapping to date have not identified distinctly elite or specialist households in Cerro la Virgen, without more extensive excavations we cannot eliminate the possibility that they exist.

Conclusion

Because of its extraordinary preservation, extent, and location, Cerro la Virgen presents us with a rare opportunity to study regional political dynamics through the media of foodways and household archaeology. Cerro la Virgen provides us with a ground-up view of the wider social history of the Moche Valley during the apex of the power of Chimú and "Inca" Empires. Keatinge and Pozorski deserve credit for introducing and developing the bottom-up approach to prehistoric societies on the coast of Peru. As Keatinge noted many years ago, we cannot understand the rise of the Chimú without understanding the farmers, fisher folk, and crafters in the hinterland of Chan Chan (Keatinge 1975: 215). In addition to the site's value for understanding the regional political economy of the Chimú Empire, the shell and fish remains of Cerro la Virgen also constitute a paleoclimatic record of extraordinary potential. The trash middens at the site encompass the onset of the Little Ice Age, circa AD 1200 to 1530. Cerro la Virgen also

has considerable value as a heritage site for Huanchaco and could be developed as an archaeological park for tourists and locals. Unfortunately, all of these resources are threatened with destruction by quarrying for gravel, which is Peru's cheapest and most abundant building material.

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Notes

1. Artifact data as well as methods of analysis are presented in detail in a forthcoming site report.

2. Wood, cane, and achupalla were weighed but not counted, and no further identification of wood was made.

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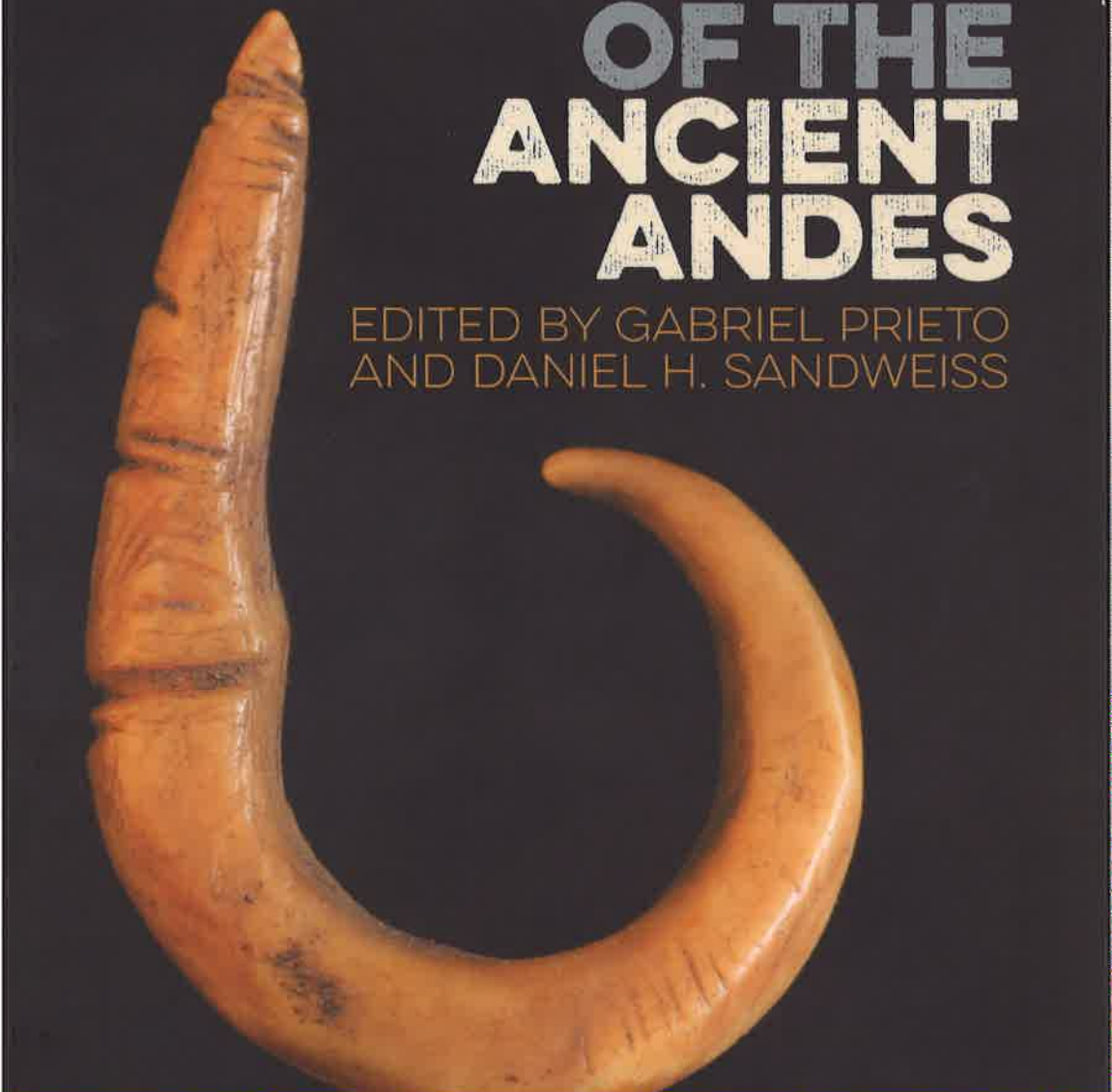

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CONTENTS

List of Figures vii
List of Tables xi
Foreword xiii
Acknowledgments xvii

1. Introduction: A Historical Perspective on the Studies of Andean Maritime Communities 1
Gabriel Prieto and Daniel H. Sandweiss

Part I. Early Maritime Adaptations (13,000 to 5500 BP)

2. Marine Communities in the Atacama Desert: Masters of the Subtropical Pacific Coast of South America 39
Calogero M. Santoro, Victoria Castro, Chris Carter, and Daniela Valenzuela
3. Economic Organization and Social Dynamics of Middle-Holocene Hunter-Gatherer-Fisher Communities on the Coast of the Atacama Desert (Taltal, Northern Chile) 74
Diego Salazar, Carola Flores, César Borie, Laura Olguín, Sandra Rebolledo, Manuel Escobar, and Ariadna Cifuentes
4. The Use and Construction History of Huaca Prieta, North Coast of Peru 101
Tom D. Dillehay

Part II. Maritime Communities between 5500 and 2500 BP

5. Changing Complexity in the Norte Chico, 3000–1800 cal BCE 131
Winifred Creamer and Jonathan Haas
6. Maritime Communities and Coastal Andean Urbanization: Preliminary Insights from Early Horizon Samanco, Nepeña Valley, North-Central Peru 165
Matthew Helmer

7. The Supply and Consumption of Marine Resources at the Inland Center of Caylán, Coastal Ancash 188
David Chicoine, Carol Rojas, Víctor Vásquez, and Teresa Rosales

8. The Fisherman's Garden: Horticultural Practices in a Second Millennium Maritime Community of the North Coast of Peru 218
Gabriel Prieto

9. The Ethnogenesis of *Pescador* Identity: The Implications of Biodistance Analyses of Initial Period (1500–1200 BC) Human Remains from Gramalote, Peru, for our Understanding of the Social and Economic Dynamics of Ancient Andean Maritime Communities 247
Richard C. Sutter and Gabriel Prieto

Part III. Maritime Communities between 2500 and 600 BP

10. Fisherman, Farmer, Rich Man, Poor Man, Weaver, *Parcialidad* Chief? Household Archaeology at Cerro la Virgen, a Chimú Town within the Hinterland of Chan Chan 267
Brian R. Billman, Dana Bardolph, Jean Hudson, and Jesús Briceño Rosario

11. Subsistence Economies in Marginal Areas with Natural Constraints: Interactions between Social Dynamics, Natural Resource Management, and Paleoenvironment in the Sechura Desert, Peru 301
Nicolas Goepfert, Philippe Béarez, Aurélien Christol, Patrice Wuscher, and Belkys Gutiérrez

12. Late Prehistoric Maritime Communities in Coastal Ecuador 318
Karen E. Stothert, Maria Masucci, and Benjamin Carter

Part IV. Maritime Communities between 600 and 300 BP

13. Maritime Adaptations at Cerro Azul, Peru: A Comparison of Late Intermediate and Twentieth-Century Fishing 351
Joyce Marcus, Kent V. Flannery, Jeffrey Sommer, and Robert G. Reynolds

14. El Contrato del Mar: Maritime Subsistence at Carrizales, Zaña Valley, Peru 366
Parker VanValkenburgh, Sarah Kennedy, Carol Rojas, and Gabriel Hassler

15. Fish[i]stories: Seafolk of the Northern Peruvian Coast 397
Susan Elizabeth Ramírez

List of Contributors 425
Index 435