THE CALDERA AND EL CARMEN SITES: LATE INTERMEDIATE PERIOD
OCCUPATIONS IN THE HUAURA VALLEY, PERU

AN ABSTRACT

SUBMITTED ON TWENTY-THIRD DAY OF FEBRUARY 2015
TO THE DEPARTMENT OF ANTHROPOLOGY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
OF THE SCHOOL OF LIBERAL ARTS
OF TULANE UNIVERSITY
FOR THE DEGREE
OF
DOCTOR OF PHILOSOPHY

BY

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ABSTRACT

In this dissertation I investigate the Huaura Valley sites of Caldera and El Carmen with the goal of increasing understanding of the Late Intermediate Period occupations in the valley. Though previous style based dating led researchers to assign the sites to the Middle Horizon, this study provides a new perspective on these sites as a result of a suite of AMS dates from excavated contexts that date the occupation to the Late Intermediate Period.

The AMS dates from this study necessitate a revised interpretation of these sites and their relationship to other Late Intermediate Period settlements within and beyond the Huaura Valley. In the context of current and ongoing research at the fortified Late Intermediate Period occupations at Acaray and Cerro Colorado in the Huaura Valley as well as recently published evidence of defensive architecture in the area of El Carmen, these investigations help clarify understanding of interregional interaction and the effects of conflict on regional settlement patterns and societies and suggest a reassessment of the Late Intermediate Period in the Huaura Valley is in order.

The pottery from Caldera and El Carmen exhibits a unique suite of characteristics that make the study of the material exciting but difficult given the general lack of secure dates on similar pottery from other sites in the valley. In addition to considering the occupants of Caldera and El Carmen in relation to their local peers within the valley and in the Chancay Valley just to the south, this research provides a chance to explore interactions between the Yschma to the south.
and Casma and Chimú to the north.
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This work is dedicated to Christine Heaton, whom I am immeasurably lucky to have as a mother and as a friend.
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I would like to thank Dr. Kit Nelson for introducing me to the Norte Chico and sharing her expertise from the Huaura Valley survey she led in 2004. Her wealth of knowledge on the valley’s history of occupation and the sites themselves helped me choose my case study sites of El Carmen and Caldera. Her enthusiasm for archaeology both in the classroom and in the field helped keep me moving toward my goal.

I would most like to thank my parents, William H. Heaton and Christine A. Heaton. Without their years of encouragement and support, this document would not exist. This is a gross understatement.

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the project; was a skilled and insightful excavator at Caldera and El Carmen; eagerly embraced learning how to map with the Total Station since mapping is not exactly a one person job; let us use his brand new Nikon camera for photographing ceramics; introduced me to falafel; and is a wonderful friend. The excavations carried out for this dissertation were made possible in part by the help of Alejo, Luis, and Levis Herrera of Acaray, Peru. Daniel de los Rios of Huacho, Peru, was an excellent driver who let us pile our gear on his vehicle each day and tolerated the mix CDs we made to help get us energized on the way to the sites. Also, the Barbosa family—Rubilinda, Sylvia, Raul, Shamir, Erving, Domingo, and Lorena—owners Bodega Lorena on Domingo Coloma in Huacho, treated us as family.

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CHAPTER 1: INTRODUCTION

The prehistoric sociopolitical structures of the North Central coast of Peru are understood at widely varying levels of detail. In this dissertation the Huaura Valley sites of Caldera and El Carmen are examined with the goal of increasing understanding of the Late Intermediate Period occupations in this region. As a result of a suite of AMS dates from excavated contexts that securely place the occupations of these sites in the Late Intermediate Period, a new perspective is now provided for late Pre-Columbian occupation in the valley. While previous style based dating led researchers to conclude that Caldera and El Carmen’s occupations were Middle Horizon, new temporally accurate Late Intermediate Period connections can be drawn relating to geopolitical and population structures of the area.

Because pottery with some stylistic characteristics of the Middle Horizon was found in the north central coast of Peru, it has been generally believed that the inhabitants who made the pottery lived there during that time period (e.g. Cruzado Carranza Carranza 2008; Nelson et al. 2010; Pierce et al. 2010). When excavation was begun at the sites of Caldera and El Carman, both located in the north central coast of Peru, it was anticipated that radiometric dating would confirm an occupation dating sometime around the height of Wari expansion. However, dates associated with what were assumed to be earlier contexts consistently fell into the Late Intermediate Period. Based on my survey of the literature, it appears that links between the north central coast and the Middle Horizon have been based heavily on presumed iconographic similarities (Brown 2008a:44-45; Stumer 1952; Usera 1972; Vallejo 2010:232) without supporting lines of evidence. The AMS dates from the sites of Caldera and El Carmen now call into question
previous assumptions placing this occupation of the north central coast in the Middle Horizon.

With the occupations of Caldera and El Carmen tied to the Late Intermediate Period, it is important to reconsider the research pertaining to the general region in the correct temporal context. Several central coast valley sites from the Late Intermediate Period (A.D. 1000-1476 [Moseley 2001:245]) have been investigated in the last couple of decades, but the Chancay culture which seems to dominate this area during the Late Intermediate Period is still not well defined. In fact, “Chancay” is better known as as an art style than as a culture (Horkheimer 1970; Jahnke 2009:2-3; Krzanowski 1991), though recent research by Van dalen Luna is starting to change this (Van dalen Luna 2014a; 2014b).

To date, the majority of work on Huaura style and Chancay style, thought to be associated with the Middle Horizon and Late Intermediate Period, respectively, is based on looted materials or museum collections without provenience information (Brown and Rivas 2004; Cruzado Carranza Carranza 2008; Usera 1972:191-192; Vallejo 2010:232-233). Unfortunately, a refined ceramic sequence bolstered by chronometric dates has not been developed for this area. Because the Huaura Valley clearly has its own unique cultural trajectory (Vallejo 2010:230), direct comparisons with better defined sequences from elsewhere in the Andes have proven problematic.

A brief description of the cultural dynamics on the Central and North Coasts of Peru during the period leading up to Late Intermediate Period is helpful in understanding the archaeological investigations on which this dissertation focuses.
On the north coast of Peru, the Huacas de Moche were occupied at least through the early eighth century A.D. (Chapdelaine 2003) while Galindo, an important Late Moche site further inland, has an occupation that “was abandoned sometime before or during the ninth century A.D.” (Lockhard 2009:297). The Chimú were dominant from ca. A.D. 900 to A.D. 1470 (Moore and Mackey 2008:783). Far to the south of the focus area, the south central Andean highlands were characterized by the expansive Wari and Tiwanaku polities from approximately A.D. 600-1000 (Moseley 2001:232) or cal A.D. 650-1050 (Isbell 2008:731). The Wari polity is known to have had distant provincial installations as far north as Cajamarca whose “Wari-ness” is indicated by both characteristic architecture as by ceramics with distinctive iconography (Conklin 1991; Cook 2004; Isbell 1988, 1991a, 1991b, 2000, and 2008; Isbell and Cook 2002; Isbell and Schreiber 1978; Isbell and Vranich 2004; Jennings 2010; McEwan 2005; Pringle 2014; Schreiber 1992, 2001, and 2005; Topic 1991).

The North Central Coast—also called the Norte Chico—which encompasses the Huaura, Supe, Pativilca, and Fortaleza Valleys (Figure 1.1), was for some time assumed to have been part of the Wari polity during the Middle Horizon (Nelson et al. 2010:171; Schreiber 1992). Architectural features of purportedly Middle Horizon sites in the Huaura Valley were at times considered “coastal variants” (Isla and Guerrero 1987; Schreiber 1992:105) which possibly indicated a lower level of control of the area by Wari, or as Schreiber puts it, a different kind of tile in the “mosaic of control” exhibited by the Wari polity over its dominions (Schreiber 1992:263). Interestingly, a recent discovery north of the Norte Chico at the Castillo de Huarmey by Miłosz Giersz and Roberto Pimentel Nita includes a series of extremely rich and ornately built Middle
Horizon tombs that suggest that Wari elites built up the site and utilized it for ancestral worship (Pringle 2014). Other recent research suggests that the north central coast populations were more independent of the Wari polity during the Middle Horizon and that these populations chose to adopt some iconographic characteristics associated with the Wari polity but were not subject to direct control (Conlee 2010; Dulanto 2008; Jennings 2005:201).

During the subsequent Late Intermediate Period the Norte Chico region is believed to have had strong ties to Chancay, Chimú, and even Casma cultures (Bria 2006, 2009; Brown 2008a; Krzanowski 1991; Vogel 2001:205). However, the nature of these connections and the power dynamics of interactions between inhabitants of the north central coast, their Chancay neighbors to the south, and Casma and Chimú neighbors to the north are poorly understood (Jahnke 2009:2-5; Rowe 1948).

In the Late Intermediate Period, the Chancay polity was based in the valley of that name, though the culture’s art style, characterized by its ornate textiles, dolls, and black-on-white pottery, is better known than the people and society who produced it. Chancay and “closely related” (Jahnke 2000:2,19) Guancho/Ychsma style artifacts are concentrated in the area encompassed by the Lurín, Chillón, Rimac, Chancay, and Huaura Valleys during the Late Intermediate Period (Jahnke 2009:2). The Chimú polity also expanded on the north coast during the Late Intermediate Period (Mackey 2009; Moore and Mackey 2008). The north central coast, however, exhibits a general scarcity of Chimú artifacts, especially when compared with the quantity of Chancay materials (Kroeber 1926; Strong et al. 1943). This has often been interpreted as a lack of Chimú
domination of this area (see Figure 1.2 for a cultural sequence for the different coastal regions.)

The initial goal of my research was to study two sites purportedly dating to the Middle Horizon based on the presence of (1) Huaura style pottery on the surface as well as (2) a distinctive adobe architecture featuring a seemingly unique architectural feature known as “embellished” doorways (see Figures 1.3 and 1.4). Embellished doorways entail an extension or thickening of the wall that proceeds into the interior of a structure. They are embellished in the sense that they are augmented, not that they are decorated in any special way per se. Nelson et al. (2010:176) define the embellished doorway as follows:

an extension of the exterior wall into the bounded space of the room, forming a 90-degree angle or L shape. This feature is present on both sides of the door and creates a restrictive passageway into the room. There is minor variability in this feature; for example, some appear only as a thickening of the doorway and not wall extensions, others are more rectangular or columnlike in shape, and a few structures, those with internal subdivisions, are missing this feature entirely.

To further define the embellished doorway as it is an architectural feature that is prominent in this research, I would add that each embellished doorway is comprised of two walls, each flanking the entranceway, perpendicular to the front exterior wall and extending roughly 40 to 80cm into the interior space of the building. From an aerial perspective, the doorway would appear to be bordered by two L-shaped elements with the shorter base of each ”L” parallel to one another and extending into the building, and the longer arm of each ”L” forming the exterior front wall on opposite sides of the doorway. The interior wall extensions of the embellished doorway are the same thickness as the exterior walls and in each example they are composed of the same material as the respective outside walls. For instance, in buildings with exterior walls of tapial (poured
adobe) or brick, the respective interior extensions of the embellished doorways are composed of *tapia* or brick as well. Also, the interior wall extensions are treated with the same finish including, in some cases at Caldera, with tinted plaster. In structures containing embellished doorways, these doorways always appear as exterior entrances. No structures were found to contain more than a single passageway communicating between the interior and exterior of the building. In structures that exhibit embellished doorway entrances and also contain internal room-like divisions within the structure, no interior embellished doorways are present. The embellished doorways contain no evidence of doors or hinges; if they previously incorporated lintels, none were present, with the possible exception of one stone at Caldera whose shape, size, and proximity to an embellished doorway made it appear to possibly be a displaced lintel. It may be that the portion of the embellished doorway that projected into the interior space of the structure afforded inhabitants some protection from wind and rain or perhaps a modicum of privacy. Another thought is that the embellished doorways were constructed in an effort to briefly deprive the individual of a sense of the contents of the room upon entering the structure.

Both Huaura style pottery and embellished doorways have been thought to be hallmarks of the Middle Horizon in the Huaura Valley (Nelson et al. 2010:171 [for both architecture and pottery]; Vallejo 2010 for pottery). The Huaura sites of Caldera and El Carmen are characterized by the presence of both of these characteristics; the two sites also show a number of similarities to one another and to others in the Huaura Valley (Nelson, et al. 2010:174). From the excavations at these sites, it was hoped that
extrapolations could be made about what was happening on a regional level in the Norte Chico during the Middle Horizon. The larger goal was to use these two sites as case studies to evaluate the relationship—or level of sociopolitical integration—between this area and the highland heartland of the Wari polity. As the Huaura Valley has neither an established architectural sequence nor a ceramic sequence with associated radiometric dates, another goal of the project was to try to securely date the unique architecture and pottery at these case study sites.

As not infrequently occurs in scientific investigations, the initial hypothesis, based on the existing literature (e.g. Cruzado Carranza Carranza 2008; Nelson et al. 2010; Pierce et al. 2010; Vallejo 2010), had to be abandoned. Though the excavations conducted for this project were admittedly small, the two sites in fact produced no dates indicative of the Middle Horizon. Radiometric dates from the excavations at the Huaura Valley case study sites of Caldera and El Carmen place the two sites well into the Late Intermediate Period. This necessitated a significant reorientation of the research problem to the Late Intermediate Period in the Norte Chico and the relationship between these occupations to contemporary Late Intermediate Period cultures along the Central and North Coasts of Peru including Casma and Chimú based north of the study area and Chancay and Yschma to the south.

The Late Intermediate Period dates from the sites of Caldera and El Carmen, require a substantial reevaluation of human occupation during the Late Intermediate Period in the region. No longer can Red, Black, and White polychrome or “Huaura
Style” pottery be simply classified as Middle Horizon or Wari-derived ceramics\(^1\). And no longer can the single-room adobe *tapial* structures with embellished doorways be considered a coastal embodiment of Wari imperial architecture (e.g. Isla and Guerrero 1987; Schreiber 1992:105, 271-272) or as evidence of local resistance to Wari imperial rule (e.g. Nelson et al. 2010). That is because, simply, these ceramics and architecture do not date to the Middle Horizon, at least not at the sites of Caldera and El Carmen.

The preparatory background research on the Wari polity with emphasis on Wari and Southern Andean Iconographic Series (Isbell 2008) ceramics, however, remains relevant to the research in that the iconography prevalent in the earlier period certainly has iconographic and stylistic connections to the iconography in the Huaura Style ceramics (Vallejo 2010:232) for which we now have Late Intermediate Period dates. The number and consistency of the dates from this research calls for a several hundred year shift in temporal focus to the Late Intermediate Period and the Chancay and Chimú polities and perhaps a re-evaluation of what “Wari influence” means (e.g. Isbell 2008:738-39,742; Schreiber 1992:278).

The shifts in temporal and, in turn, political foci provide an unexpected opportunity to explore different but equally relevant questions about changing political dynamics during the Late Intermediate Period on the Norte Chico region of Peru. The investigations also provide a new perspective on Huaura style pottery and the distinctive architecture with its hallmark embellished doorways (Nelson et al. 2010; Vallejo 2010).

Though the Huaura Valley was undoubtedly occupied during the Middle Horizon, the diagnostic features of such occupations are clearly different from what scholars have

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\(^1\) The Andean region has a long history of reuse of forms and iconographic characteristics, but the time difference between El Carmen and Caldera and Wari sites argues against the likelihood that pottery at the Huaura Valley sites was directly derived from Middle Horizon pottery.
previously believed and these features are arguably yet to be defined. This will undoubtedly be the focus of meaningful research in the future. The clustered Late Intermediate Period dates from secure contexts at Caldera and El Carmen necessitate a shift in focus from the Middle Horizon with Wari as a political dominator to the Middle Horizon’s SAIS or Southern Andean Iconographic Series (e.g. Isbell 2008:732) as an indirect influence in the development of the polychromes of the Huaura Valley during the Late Intermediate Period. When considered in light of other work at Late Intermediate Period sites in the Huaura Valley (e.g. Brown 2009a:227-29; Dunn 2011; Dunn and Heaton 2013; Nelson and Bellido 2010; Pierce Terry et al. 2010; Nelson et al. 2011; Rutherford 2012, 2014; Pierce Terry and Rutherford 2014), these investigations also serve to document changes in material culture within the Huaura Valley during this period.

The research presented in this dissertation suggests a reevaluation of the architectural and pottery styles in the Huaura Valley is necessary for understanding the nature of interactions between people in the Norte Chico and elsewhere in Peru during the Late Intermediate Period before any broader statements can be made about the prehistory of the Norte Chico region, the Central Coast, and North Coast of Peru. This study has a tight focus in that it investigates only two sites in a single valley chosen for their shared characteristics in terms of surface pottery and architecture as well as comparatively good preservation. Though the specific focus of this dissertation is two Huaura Valley sites as case studies, it is hoped that this research will serve as an initial step in refining chronological sequence at other sites in the Norte Chico which will in
turn assist in piecing together a better understanding of interregional interaction during the Late Intermediate Period.

The following chapter provides a brief review of central Andean prehistory as well as a summary of the archaeological research that has taken place in the Norte Chico region to date. The third chapter is comprised of detailed descriptions of the study sites of Caldera and El Carmen with attention to architectural features and construction techniques. This is followed by the fourth chapter which discusses the selection of Caldera and El Carmen as case studies. Field methods, excavations, and the contexts of the AMS dates are also presented in this chapter. The fifth chapter is a discussion of the pottery collected in excavations and surface collections, while the sixth chapter focuses on the chronology of the occupations integrated with the AMS dates and pottery. The final chapter outlines the conclusions of this research with a summary of the results. Following the conclusions are all of the figures referred to in this document as well as appendices of analyses of bone, shell, pollen, botanical remains that were carried out by specialists to gain a more complete understanding of the study sites and their role in the Late Intermediate Period. Finally, the original attribute analysis code sheet is provided as an appendix, and the raw data is readily available upon request.
CHAPTER 2: PREVIOUS RESEARCH

Introduction

The transition from the Middle Horizon to the Late Intermediate Period in the Andes is characterized by a fracturing of previously dominant state-level polities and an increase in smaller, regional polities. Surveys have pointed to an increase in settlement density during the Late Intermediate Period on the North Central Coast (e.g. Cardenas 1977-1978; Nelson and Ruiz Rubio 2005). Though it has been suggested that an intermediate period is characterized by much less interregional interaction between regionalized groups than during a horizon (Willey 1991), there is evidence to suggest that Late Intermediate Period groups, at least in the central Andean region, were not so isolated as was previously believed (Brown Vega 2008a:32). Further, as Brown Vega points out, “Studies of the Late Intermediate Period have been plagued by an inability to frame localized cultural dynamics within regional spheres of process and change” (Brown Vega 2008a:32)

Though researchers have made strides in the study of the prehistoric occupations of the Huaura Valley, Strong and Willey’s 1943 statement, “…in the Huaura valley there are a great number of sites which are little known or published” (Strong and Willey 1943:10), is still true. In the early 1940s William Duncan Strong, Gordon R. Willey, and John M. Corbett spent a year dedicated to archaeological fieldwork in Peru through the Institute of Andean Research and the Office of the Coordinator of Inter-American Affairs. This fieldwork which took place on the Central Coast of Peru included work at Pachacamac, the Chancay Valley, and Ancon, and their resulting publications provide a detailed, early resource on the archaeology of this area of Peru (Strong et al. 1943).
This chapter provides a brief summary of central Andean prehistory as well as a review of the history of archaeological fieldwork in the Norte region. The cultural historical framework is useful for understanding the prehistory of the Norte Chico region of the Peruvian coast, and the Huaura Valley in particular, through an examination of previous and ongoing research. A description of archaeological fieldwork that has been carried out in the region is important to establish the context in which the excavations for this dissertation were carried out and to highlight the comparative scarcity of data from this region.

**Previous Research in the Huaura Valley**

The archaeology of the North Central Coast, or Norte Chico, has been studied sporadically. The area has most recently been the subject of more attention due to studies of Preclassic and Late Intermediate Period sites in the area (e.g., Advíncula 2005; Alarcón 2005; Chu 2006, 2006b, 2011; Dunn 2011; Dunn and Heaton 2010, 2013; Fung 1974, 1988; Haas and Creamer 2004, 2006; Haas et al. 2004, 2005; Krzanowski 1986, 1991; Nelson and Ruiz Estrada 2010; Nelson et al. 2013; Pazdur and Krzanowski 1991; Pierce Terry and Rutherford 2014; Rutherford 2012, 2014; Pozorski and Pozorski 1990; Ruiz Estrada 2006; Shady and Leyva 2003; Vega-Centeno 2005; Zechenter 1988). Several surveys (e.g., Cárdenas 1977; Nelson and Ruiz Rubio 2005) indicate that the valley contains archaeological sites from the Preclassic Period through Colonial times. There has been some excavation at a scattering of sites in the Huaura Valley including Acaray (Brown 2005, 2006; Brown and Rivas 2004; Brown 2008a, 2008b, 2009b); Rontoy, Quipico, Centinela, Chambara (Nelson and Ruiz Estrada 2007; Nelson and
Bellido Cerda 2010; Nelson and Ruiz Estrada 2010); and Casa Blanca and Quintay (Krzanowski 1991). The focus of these investigations was the Late Intermediate Period. The most thoroughly studied site in the Huaura Valley to date is the fortress of Acaray, which encompasses an Early Horizon fortress and a Late Intermediate Period occupation (Brown Enrile 2005, 2006; Brown and Rivas 2004; Brown 2008a, 2008b, 2009a, 2009b).

With a focus on the Huaura Valley, I will summarize the study of: (1) aerial photography and satellite imagery, (2) archeological survey, and (3) archaeological excavation. Of course, many projects incorporate several of these kinds of archaeological inquiry.

**Aerial Photography and Satellite Imagery**

Surveys and aerial photographs are particularly important in the study of a valley with rugged terrain that was once largely dismissed as unoccupied territory or as a frontier zone between polities. Servicio Aerofotográfico Nacional (SAN) photographs from 1943 are therefore a key resource. Kosok (1965) utilized aerial photographs to locate and to record sites in the Norte Chico region, and this study remains an invaluable aid in survey as well as providing a means of illustrating changes in sites caused by agricultural encroachment and modern occupation, not to mention looting.

Google Earth® is also a useful resource² (see Bousman [2006] and Ur [2006] for a basic description of its accessibility and utility.) As Brousard (2006,32) points out, “Google Earth uses recent still photographs, and replaces images as they become available”, and the software also allows users to access its older imagery as well.

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² It should be noted, though, that there are ethical concerns with the use of this technology. For instance, both Brousard (2006:34) and Ur (2006:35-37) have urged archaeologists to use caution in using Google Earth and other imagery to publish precise locations of unprotected sites for obvious reasons.
As such “historical” Google Earth images are available from the Huaura Valley from as recently as 2004, when the initial version of what was later given its current moniker of Google Earth was launched, it is clear that Google Earth will also be an effective tool in the future for tracing changes in the landscape of archaeological sites through comparatively small increments of time. Google Earth provides imagery of both Caldera and El Carmen from April of 2009 (see Figures 2.1 and 2.2). However, while satellite and aerial photography significantly assist archaeological investigations, they cannot replace on-the-ground observations such as those collected in survey.

Survey

Often initially aided by the available aerial photographs and satellite imagery, systematic on-the-ground surveys of the Huaura Valley provide some of the best broad-spectrum data on the archaeology of the area, though, as Brown et al. (2011:1688) point out, “hilltop, mountaintop, or otherwise marginal areas in rough terrain may not be systematically included when designing and executing surveys.” Julio Tello surveyed the Huaura Valley, with a focus on the river mouth area, in 1937, and this appears to have been the first recorded archaeological survey of the area. Focusing his interest on sites dating to the later periods of prehistory, Tello recorded the sites of Visquira, Rontoy, La Centinela, Mazo, Vilcahuaura (Nelson and Ruiz Estrada 2007:7, citing Mejía 1956).

With the Seminario de Arqueología del Instituto Riva Agüero de la Pontificia Universidad Católica del Perú, Mercedes Cárdenas Martín conducted a survey of the Huaura Valley in June and July of 1977 (Cárdenas 1977, 1977/1978, 1988). Using air photos as a preliminary guide, followed by visiting sites visible in the aerial photographs...
to spot check the surface artifacts, Cárdenas recorded 235 sites. Because some sites either contained multiple components or because some sites were clustered together in terms of physical proximity, Cárdenas counted a total of 251 sites. Nelson and Ruiz Estrada (2007,8) note that some of these sites were identified only through aerial photos, and there is no record with detailed descriptions and exact locations. In 1980 Arturo Ruiz Estrada examined the valley with a special focus on the later occupations of the area (Ruiz Estrada 1981, 1991, 1999, 2006; Nelson and Ruiz Rubio 2005:6).

Another survey was done by Jaime Miasta Gutiérrez and Francisco Merino Jiménez in 1986. It covered the valley from the river mouth to Sayan. This survey relied heavily on aerial photographs, though site visits were made in cases in which it was determined that the aerial photographs were distorted or otherwise insufficiently reliable. Grouping sectors of sites together so as not to drive up and misrepresent the number of sites, Miasta and Merino recognized 131 sites and utilized a simple numerical nomenclature from Site 1 to 131. This work produced more detailed descriptions of the characteristics for each site registered by the survey and provided UTM coordinates for the sites as well (Miasta, Gutiérrez, and Merino 1986; Nelson and Ruiz Rubio 2005,24). Obviously, because the work of Miasta and Merino relied more heavily on literature and aerial imagery than on-the-ground observations, its main focus is on architecture rather than a combination of architecture as well as other cultural materials present on the surface of the sites. As Nelson and Ruiz Rubio (2005) point out, survey work like that of Miasta and Merino is valuable in light of preliminary results they afford, but while such data certainly contributed a valuable foundation for later work, more in-depth survey
including more site visits was necessary in order to achieve a better detailed understanding of the chronology of occupations in the Huaura Valley.

Nelson and Ruiz Rubio’s (2004) survey of the Huaura Valley is the most recent survey and covers the area from the river’s mouth to the town of Sayan. Though their work began with a study of aerial photos from the valley, members of their survey team visited each site to evaluate surface architecture as well as artifacts, especially pottery. Nelson and Ruiz Rubio confirmed the presence of several ceramic styles of unknown date. These include Geometric Tricolor and Pativilca Impressed styles which are not securely dated. During their survey they also identified Black on White (Chancay), Cayash, and Lauri Impressed as described by Krzanowski (1991). Nelson and Ruiz Rubio attribute a total of 66 sites in the valley to the Middle Horizon and 221 to the Late Intermediate Period (Nelson et al. 2005, Table 2). Nelson and Ruiz Rubio’s (2005) survey differed from previous ones in that it resulted in a GIS database which incorporates modern data such as road, canal, and village locations as well as data available from the older air photos including the location and size of sites that have been partially or completely destroyed by modern agricultural and city expansion (see Figures 2.3, 2.4 and 2.5). This provides a longitudinal aspect to the data. Due to changes in irrigation and installation of canals, encroachment of modern occupations even since the previously mentioned surveys were conducted, Nelson and Ruiz Rubio’s survey of the valley is useful in that it captures the level of preservation of the prehispanic occupations at a particular moment in time, specifically 2004. This is an important reference tool in that subsequently modern occupation and agriculture continues to modify the terrain.
At the same time that this detailed survey data is crucial, there are some aspects in which it has shortcomings by the simple virtue of being a survey. Unfortunately, the report does not include maps of sites by time period, though this may be just as well given the fact that some of the sites’ temporal designations may be inaccurate based on some of the findings. This is not meant as a criticism of the surveyors. They were relying on surface observations in a valley without an established ceramic sequence with correlating radiometric dates, and their investigation was exceedingly thorough. However, the data on settlement patterning for the Huaura Valley do require reconsideration and further investigation.

With similar methodology to that of Nelson and Ruiz Rubio’s (2005) survey of the Huaura Valley, two other Norte Chico valleys, the Pativilca Valley (Perales 2006) and Fortaleza Valley (Perales 2007), have also been surveyed. Neither the Pativilca and Fortaleza survey data are published beyond reports for the Instituto Nacional de Cultura (now known as the Ministerio de Cultura). There is no survey data from the Chancay Valley, which is south of the Norte Chico but relevant to a study of the later occupations of the Norte Chico (Brown Vega et al. 2008a:57).

In a recent publication based on a combination of study of aerial/satellite imagery followed by “ground truthing,” Brown Vega et al. (2011) use a combination of Google Earth® imagery and Servicio Aerofotográfico Nacional (SAN) photographs as a foundation for the survey of hilltop fortresses through 13 valleys in Peru. In this publication they focus on two valleys within the Norte Chico, the Fortaleza and the Huaura, as case studies. For the Huaura Valley, they first looked at SAN series 1008 from 1945 (scale 1:10,000) and marked anomalies visible in the air photos in Google
Earth. Subsequently, the team visited sites to test whether their observations from the aerial imagery was correct. They describe the process as follows:

…field observations, temporally diagnostic surface assemblages, and architectural styles permitted a tentative determination of when forts were built and in use. This determination might be complicated by diagnostic subsurface features that were not visible. Nevertheless, we have identified multicomponent sites based on surface characteristics” (Brown et al. 2011:1685).

Brown Vega et al. (2011) argue that Nelson et al. (2010) assert “in six instances within the paper that Middle Horizon sites lack the ‘classic hallmarks of defensive architecture’ or that a lack of defensive posturing in part defines Middle Horizon settlement patterns within the valley (Nelson et al. 2010, 173, 176, 178-179, 182-183)” (Brown et al. 2011:1686). They argue that twelve fortified sites in the Huaura Valley do, in fact, bear Middle Horizon components. Immediately after making this assertion, they point out that it was not within the scope of their ground-truthing project to provide AMS dates to confirm this, and they do not elaborate on what those Middle Horizon signifiers are.

Brown Vega et al.’s (2011) reevaluation of architecture at purportedly Middle Horizon sites led them to assert that Nelson et al. (2010) had “mischaracterized” Middle Horizon settlement patterns.

A study of the area as well as both Nelson et al.’s (2010) publication and Brown Vega et al.’s (2011) methodology, it appears that there may be site-related factors affecting the differing perspectives in these publications on Huaura Valley. The site boundaries for El Carmen utilized by Nelson and Ruiz Rubio’s survey (2005) and the subsequent work by Nelson and her colleagues (Nelson et al. 2010) differ from the area Brown Vega et al. focused on. Nelson et al.’s work studied the occupation in the quebrada and omits the stone architecture that is present on the steep slopes and
hilltops surrounding the *quebrada* due to time constraints (see also the methods chapter of this dissertation), while Brown et al.’s team focused on the hillside and hilltop structures. While fieldstone architecture is known to continue up the hillsides at El Carmen, especially on the east side of the *quebrada* where the grade of the topography is less steep than it is on the western side, the scope of a valley survey and time allotted for such a major project could not allow the survey team to cover every hillside and hilltop, and this specific hilltop is a 45-minute climb from the *quebrada*. This author believes that, at least in the case of El Carmen, Nelson et al. (2010) focused on the occupation in the *quebrada* which contains *tapial* (poured adobe) architecture with embellished doorways as well as sprawling, internally subdivided fieldstone compounds, while the work of Brown et al. (2011) focuses on the hillside and hilltop occupations which are arguably part of the same site but were not included in the site polygon produced by Nelson and Ruiz Rubio’s survey (2005) for the aforementioned reasons. Without securely dating both the fieldstone architecture and adobe architecture at this multicomponent site, hypotheses regarding the site’s defensibility during the Middle Horizon may need to be reconsidered (see Figure 2.6).

**Excavation**

Max Uhle (1925) conducted some of the earliest archaeological investigations in the Norte Chico region. He was the first to excavate there, with the goal of using ceramic vessels with clear provenience to develop a chronology of occupation for the coast of Peru. Uhle focused his excavations around the mouth of the Supe Valley, including
Chimu Capac, San Nicolas, and Aspero. A study of the ceramics recovered by Uhle was published by Kroeber 1925 along with an appendix by Uhle.

Willey and Corbett (1954) were also among the archeological pioneers of the region. They excavated in the 1940s in several small coastal villages located at the mouth of the Supe Valley. Among the excavated sites was Aspero, and here Willey and Corbett excavated in a Preclassic midden and later in a cemetery (Nelson and Ruiz Estrada 2007:6). The Puerto Supe was excavated by Strong and Willey (1943).

More recent archaeological excavation in the Norte Chico has been undertaken by several scholars. With her project at the major Supe Valley Preclassic site of Caral, Ruth Shady dominates most of the recent literature for the Supe Valley (e.g., Shady 1997, 2006; Shady and Levya 2003). Under the auspices of Proyecto Arqueológico Norte Chico (PANC), Winifred Creamer and Jonathan Haas have conducted extensive research in the other valleys of the Norte Chico. Their work has primarily focused on the Preclassic occupations in the Huaura, Fortaleza, and Pativilca valleys (e.g., Haas and Creamer 2004, 2006; Haas, Creamer, and Ruiz 2004, 2005; Haas et al. 2007). Many publications and theses have been written under the auspices of the PANC project. Among these is a study of PANC-excavated Pativilca Valley ceramics by Rebecca Bria (Bria 2006, 2009).

**Key Sites**

Although a variety of sites were documented during the 2004 survey (Nelson and Ruiz Rubio 2005), the Middle Horizon occupation of the Huarua Valley, on which this research initially focused, is largely unknown in the area since few Huarua Valley sites with Middle Horizon occupations have been systematically investigated via
archaeological excavation. Notable exceptions include the sites of Végueta (Shady 1979, Shady and Ruiz 1979) and Pampa de las Animas by Pieter Van Dalen Luna in 2006 (Nelson, personal communication 2009; Van Dalen, personal communication 2010), though Van Dalen’s work has not been published. Due to the lack of radiometric dating, however, these temporal designations may need to be reevaluated.

The following descriptions of Huaura Valley sites are organized geographically roughly west to east, the closest to the coast first and then moving east and inland. Next discussed are some key sites in the Norte Chico valleys to the north: Supe, Fortaleza, and Pativilca, and then moving south of the Norte Chico to mention the Chancay Valley.

Végueta

According to Ruiz and Shady, the site of Végueta was occupied during the Early Intermediate Period and was then utilized as a cemetery in the Middle Horizon (1979:678,682). Shady and Ruiz Estrada excavated a burial site they attributed to the Middle Horizon that included (1) a White-on-Red jar of the Végueta complex (a style that begins in the Early Intermediate Period and persists through later times), (2) a painted and impressed vessel with form and decorative similarities to the “Teatino style from Ancón and the Chancay Valley” (Shady and Ruiz 1979:682, citing Bonavia 1962), and (3) a fragment with polychrome painting “related to the Nazca 9 and Chakipampa A styles of the Middle Horizon Epoch 1A on the south coast and central highlands” (Shady and Ruiz 1979:681-82). Though they provide no further description of Middle Horizon architecture at the site of Végueta, Shady and Ruiz assert “[p]yramidal mounds and large cemeteries indicate that the surrounding area supported a considerabled population” (1979:676).
Cerro Colorado

Cerro Colorado, a fortified site near the modern town of Huacho, was visited by Brown Vega in 2008, and Brown she asserts that the site has an Early Horizon component in addition to the Late Intermediate Period occupation apparent via surface observations of ceramic sherds (Brown 2008a:50,246-47). There is also a cemetery associated with the site of Cerro Colorado but outside the fortification walls (Brown 2008a:246; Ruiz Estrada 1999:80,82; Rutherford personal communication 2010). Allen Rutherford, currently a graduate student at Tulane University, is conducting his doctoral dissertation research at the site of Cerro Colorado (e.g., Nelson et al. 2011; Rutherford 2012, 2014).

Muralla de Mazo

Nelson and Ruiz Estrada included the Muralla de Mazo in their 2007 study of several sites in the Huaura Valley (Nelson and Ruiz Estrada 2007:45; see also Rostworowski 1978:132-33). Brown-Vega describes Muralla de Mazo as “a massive wall,” which was built after the Early Horizon and is associated with Acaray and reflects a “threat to Acaray…from the north” (2008a:340) during the Late Intermediate Period. Some scholars suggest that the Muralla may have been connected to Acaray in earlier times (Brown 2008a:51, citing Rostworowski 1978:132-33; Cárdenas 1977:56). Nelson and Ruiz Estrada (2007) collected eight samples from the Muralla for AMS dating (Nelson and Ruiz Estrada 2007:12,43).
Pampa de las Ánimas

Interestingly, until very recently, the most detailed, accessible description of the site of Pampa de las Ánimas comes from the research of a scholar who studied a sampling of the human remains scattered on the surface of the site by looters (see Jahnke 2009). Jahnke describes the zone on which her research focused as follows:

*PV41-367 (locality 1428)* is a large cemetery located on a north-facing sandy slope at the eastern edge of Pampa de Animas. Looting is active here and must be profitable due to the rich burials and easy digging. At least two looters were present each day I arrived at the site. The looters’ pits are deeper near the top of the hill and some are quite large, being more than two meters deep and at least that in diameter. There is no apparent architecture in this cemetery, although scattered adobe bricks were observed in the eastern part, nearest the road. Agriculture poses another imminent threat here. Neighboring farmers are staking claims along the road by planting small trees. This is usually a prelude to expanding irrigation and farming. Artifacts observed here include numerous whole vessels (several in the Chancay black-on-white style), yarn-wrapped reeds, weaving kits, and accessories. Also present were gourd bowls containing food such as maize, peanuts, and other offerings (Jahnke 2009:62).

Pieter van Dalen Luna has excavated at Pampa de las Ánimas in 2006, and he put out a publication on his research at the site in 2014 (Pieter van Dalen 2014a). He interprets the site as having been occupied from the Middle Horizon through the Late Horizon. He notes that the times of densest habitation at the site fall in the Middle Horizon, which he associates with Huaura culture, and the subsequent Late Intermediate or “Chancay Period” culture (van Dalen Luna 2014a:242). He states that the “Huaura Period” is characterized by structures that are quadrangular in plan with *tapial* bases, ceremonial spaces with wall niches and murals, and that some of these were sealed and built up in the following Chancay period (2014a).

Vallejo reports that the site of Pampa de las Ánimas bears ceramics with varied stylistic components including “Middle Horizon, Teatino, Huaura, Geometric Tricolor,
Huacho and Chancay” (2010:232-33, translation by Heaton). As Vallejo does not provide a citation for these data, it would appear that he has visited the sites or studied collections gathered from Pampa de las Ánimas and made these observations.

**Luriama (PV 41-276, PV-278)**

The 2004 Huaura Valley survey team gave Luriama multiple PV numbers, including PV 41-276 and PV-278 (Nelson and Ruiz Rubio 2005; Jahnke 2009:59-60). Again, the best available description of the site comes from Jahnke (2009) who did osteological and biodistance analysis on samples collected from several sites in the Huaura Valley. Jahnke described the site of Luriama with its three cemetery areas as follows:

> Throughout the cemetery are numerous adobe *tapial* walls forming rectangular rooms with the approximate dimensions of 4 x 4 meters. The depth of the walls is unknown and no adobe brick was observed in this cemetery. Grave goods are abundant in this cemetery, including whole ceramic vessels, *cuchimilcos*, and textiles, but there is very little organic refuse” (2009:59). She further noted that purportedly Middle Horizon and Chancay pottery were present on the surface of the site (Jahnke 2009:60).

Davenport and Nelson did a study on *cuchimilcos*, figurines usually made of wood or pottery, from several sites in the Huaura Valley including Luriama. They used portable X-Ray Fluorescence (PXRF) equipment to test for mercury sulfate (cinnabar) as a component in the artifacts’ surfaces. For the sample *cuchimilco* from Luriama as well as the others they tested, Davenport and Nelson found that the surface had been treated with iron, not cinnabar, which is different from the typical treatment of the human remains with which *cuchimilcos* are generally associated (Davenport and Nelson 2010).
Quipico (PV41-181)

In 2007 Ruiz Estrada and Nelson performed limited excavations at five Huaura Valley sites including Quipico (Nelson and Ruiz Estrada 2007:26-34), an 8-9ha site north of the Huaura River and about 28 km from the coast. Quipico has seven adobe tapial compounds (Dunn and Heaton 2013). Nelson and Ruiz Estrada’s work focused on Late Intermediate Period and Late Horizon occupations (2007:2), and later Nelson and Bellido worked together on the macrobotanicals from the site to explore the subsistence patterns of the occupants. Their work also provides some AMS data for the site: “Quipico has a tight date cluster with a range of CE 1365-1405 based on three AMS samples” (Nelson and Bellido 2010:47). Based on the 2004 survey of the valley by Nelson and Ruiz Rubio (2005), a primary goal of the excavations at Rontoy, Quipico, Centinela, and Chambara carried out by Nelson and her team in 2007 was to develop a reliable ceramic chronology for the area. Unfortunately, the anticipated ceramic chronology did not come to fruition.

Subsequent excavations at Quipico have also been conducted after those of Nelson and Ruiz Estrada. Concurrent with excavations of the occupations at Caldera and El Carmen in 2009 were excavations at the Late Intermediate Period site of Quipico by Stacy Dunn. In fact, collaborating with licensed archaeologist Stephanie Pierce Terry, Dunn and I co-directed the excavations. Nascent results from the excavations at all three sites can be found in the final report, submitted to INC (Pierce Terry et al. 2010) and papers by Heaton and Dunn (Dunn 2011; Dunn and Heaton 2013; Heaton and Dunn 2013). Dunn’s work at Quipico explores the role of rural or intermediate-level elites in the Chancay polity during the Late Intermediate Period (Dunn 2011). Dunn notes that
evidence from her study of the site suggests that the site served as an outpost for local elites to observe or even oversee movement or resources (Dunn and Heaton 2013).

**Outside the Huaura Valley in the Norte Chico: Supe, Fortaleza, and Pativilca**

Any discussion of the archaeology of the Norte Chico would be incomplete without mention of the Preceramic occupations, with Caral in the Supe Valley and Caballete in the Fortaleza Valley being key sites (e.g. Creamer et al. 2011; Haas 2005; Haas and Creamer 2001, 2004, 2006; Haas, Creamer, and Ruiz 2002, 2003, 2004a, 2004b, 2005, 2007; Shady 1979, 1993, 1995, 1997, 1999a, 1999b, 1999c, 1999d, 2000a, 2000b, 2000c, 2001, 2003, 2006; Shady et al. 2001, Vega-Centeno 2005). Though detailed discussion of this period and the sites dating to it is not strictly pertinent to this dissertation, it should be noted that the exciting research on the Preceramic highlights their importance of these early centers of monumental architecture and ritual which is in contrast with the constellation of smaller sites seen in the valley during the Late Intermediate Period.

Haas and his team carried out excavations at the Fortaleza Valley site of Huaricanga in 2007 (Haas et al. 2007). They date the occupations at the site to the Late Preceramic and the Initial Period (Creamer et al. 2011), and their excavations explored the subsistence patterns and political economy of the site (Creamer et al. 2011). More recent excavations have been carried out at the Castillo de Huaricanga and were led by Martin Authier, a graduate student at Southern Methodist University.

Vega-Centeno (2005) excavated the Fortaleza Valley site of Cerro Lampay. This work resulted in a quantity of published dates from a variety of contexts ranging from 2066 BC to 2411 BC with a couple of outliers (Haas and Creamer 2006:750). Creamer et
al.’s work at the site of Porvenir, a ca. 50 ha Fortaleza Valley site with six mounds and two sunken circular plazas among other architectural features, dates the occupations to the Late Preceramic period (Creamer et al. 2011).

Vega-Centeno has excavated at the site of Cerro Lampay in the Fortaleza Valley which has produced numerous dates from the Preceramic Period (2010:128-130). Recent excavations have focused on the construction and use of ritual space, hierarchies, community interaction, and the populations’ varying relationships with the inhabitants of larger Preceramic sites such as Caral (2010:132).

Chancay Valley: Lauri

Located in the Chancay Valley, one valley to the south of the Huaura, the site of Lauri is also known as La Calera de Lauren and, by Kroeber, Site B (Jahnke 2009:20; Kroeber 1926). Lauri was excavated early on by Uhle (Brown 2008a:55; Uhle 1926). Horkheimer later led excavations there, and under the auspices of this project, Cornejo Guerrero investigated some 18 burials at the site (Murro 1997:253-54). Cornejo Guerrero used this data in his undergraduate thesis and subsequently published a modified version of the material sequence (Cornejo Guerrero 1991). Unfortunately, the large administrative site has suffered severe looting which obfuscates a clear picture of the site’s layout, though it appears to have been characterized by a central zone containing pyramidal mounds with associated settlements around it. Jahnke recently studied some of the human remains within the mortuary areas associated with the site (2009:24).
General Conclusions about Previous Work in the Norte Chico and Chancay Valley to the South

The most thoroughly studied and published sites from the Norte Chico date to the Preceramic Period. Within the Huaura Valley specifically, the coastal Late Preceramic site of Bandurria has been investigated by Fung (1974) and Chu (2006a, 2006b, 2011). The fortress of Acaray, which bears an Early Horizon as well as a Late Intermediate Period occupation, was studied by Brown. Brown’s research at Acaray focused on defensive architecture and warfare (2008a; 2008b) but not on the site’s pottery. As Bandurria’s occupation dates to the Late Archaic, there is no pottery to study.

Despite several surveys of the Huaura Valley (e.g., Cárdenas1977/1978, Nelson and Ruiz Rubio 2005, etc), and excavations including those at Rontoy, Centinela, Chambara, and Quipico in 2007 (Nelson and Ruiz Estrada 2007) with the useful goal of establishing a ceramic chronology which could be tied to both occupations and absolute dates—no such chronology has been developed for the Central Coast or the Huaura Valley more specifically.

It was long thought that black/red/white polychromes signified the Middle Horizon occupation. This assumption affected numerous projects (e.g., Brown 2008a; Jahnke 2009; Nelson and Ruiz Rubio 2005; Nelson et al. 2010; Vallejo 2010). With the radiometric dates now available, however, this idea may need to be re-evaluated.

With the publication of a robust group of dates from the site of Acaray over the last decade, as well as current research at other Huaura Valley sites including Cerro Colorado (e.g. Nelson et al. 2011; Pierce Terry and Rutherford 2014; Rutherford 2012, 2014), Quipico (e.g. Dunn 2011; Dunn and Heaton 2013), the data from El Carmen and Caldera...
help broaden our understanding of the sociopolitical dynamics at work in the Huaura Valley during the Late Intermediate Period.
CHAPTER 3: THE HUAURA VALLEY SITES OF CALDERA AND EL CARMEN

Caldera

Caldera is a 1 ha site located in a small quebrada (wash) north of the Rio Huaura. It is about 22 km from the Pacific Ocean as the crow flies and 2 km north of the present riverbed. Along its path toward the river mouth, the Rio Huaura has been tapped and diverted to fulfill the agricultural needs of the valley’s modern inhabitants, so the river’s present dimensions and capacity are probably less than they were during the Late Intermediate Period.

Stumer (1952) visited and described Caldera, and more recently Nelson and Ruiz Rubio have mapped some of the most visible structures (2005). Though there are more buildings present at the site, Nelson and colleagues were able to sample 13 of the central structures which were most visible (due to wall height) and possibly best preserved (Nelson et al. 2010:178). There is no published evidence that any archaeological excavation had been carried out prior to this project in 2009, however.

In the weeks prior to excavations and at the request of the Instituto Nacional de Cultura (now the Ministerio de Cultura), the site was subdivided into sectors. Because the site is not large and the architecture is a mix of adobe brick and adobe tapial (poured adobe) structures, Caldera was divided into arbitrary Sectors A, B, and C based on the topography of the site. Sector A is the highest area of the site and comprises approximately one-third of the site; Sector B is the middle one-third of the site; and Sector C is the area of lowest elevation at the site. Sector A contains the tallest standing
walls, some clear examples of internally subdivided structures, and the greatest number of walls with preserved tinted plaster of the three sectors at the site. Many of the walls that are present in this sector show graffiti that, if accurately marked, fall in the Nineteenth and Twentieth Centuries. The western parts of both Sectors B and C are marked by an intrusive, presumably later Late Intermediate Period burial area (as suggested by the presence of Chancay Black-on-White pottery on the surface) with less visible architecture, and these lower sectors have more visible evidence of recent looting.

The dispersal of structural remains visible on the surface of Caldera suggests that the site was fairly evenly covered with architecture with the possible exception of the western portion of Sectors B and C (see Figure 3.1) This understanding may be invalidated by future work at the site, but, as the maps produced through this research illustrate, little architecture is visible on the surface in the lower sectors of the site (see Figure 3.2.) Further, this area of the site shows substantial indications of looted burial contexts, and this may be masking remnants of preexisting architecture.

At the site of Caldera all visible architecture is composed of adobe in two forms or construction techniques. Based on on-site evaluation as well as the excavations in 2009, it seems that stone was not incorporated into construction techniques at Caldera. The adobe architecture at Caldera stands over two meters tall in some places at the site. The first type of adobe architecture present at the site is adobe bricks combined with adobe mortar (see Figures 3.3 and 3.4); in most cases this brick-and-mortar architecture is covered by an adobe plaster which is often painted or tinted (Nelson et al. 2010) (see Figure 3.5). The second type of architecture is adobe tapial with walls of varying thickness. No stone architecture was visible on the surface, and this is in distinct
contrast with the multicomponent site of El Carmen, the other Late Intermediate Period case study site analyzed in this dissertation.

At Caldera a subset of the structures is subdivided, but most structures at the site appear to be single cells. These single room structures sometimes share a wall with another room, but the adjoining rooms have no internal pathway through the shared wall. Rather, the layout suggests that inhabitants would have had to go outside and utilize the adjoining room’s entryway to access it from the outside.

The only clear examples of passageways within structures at Caldera are present in the subdivided structures in Sector A, particularly on the eastern “wing” of the quebrada. These passageways have finished faces. These prepared, finished surfaces on the passageways differentiate them from post-habitation disturbances, such as is indicated by looters’ partial destruction of many walls. Such post-habitation disturbances are common at the site. An additionally notable detail about these internal doorways in the subdivided structures is that these do not exhibit the “embellished” feature (Nelson et al. 2010) common to the passageways connecting to the outside.

The layout of structures at Caldera in terms of wall directionality and entryway orientation appears to be ad hoc, with wall length varying between about 3m to about 12m in length. There is no uniformity in the way doorways faced, and there are multiple examples of entryways directly facing a wall with only a thin alleyway less than 1 m wide between them.

There is no plaza or other focal point detectable at the site of Caldera, though there is a preserved section of a wall in Sector C that is significantly thicker than all other walls observed at the site. This wall segment, which is about 1m thick, was constructed
on a rise—though it is unclear whether this rise is manmade or natural—in Sector C which is otherwise characterized by the lowest elevation at the site. This wall segment has a north-south orientation and its sheer width suggests the closest thing to monumentality present at the site. Unfortunately, due to various disturbances, which likely include a combination of looting as well as flooding, this was not a viable section of the site to investigate via excavation.

The function of Caldera is not entirely clear, but following Occam’s Razor, the simplest explanation is that the structures are habitational in nature. Again, the idea that people lived in these structures is not corroborated by clear evidence of middens, hearths, or other such archaeological correlates, but neither is there see apparent characteristics of ritual or administrative function.

The location of Caldera does not appear to have been chosen with defensive characteristics in mind (Nelson et al. 2010); the site shows no evidence of fortification in terms of exterior walls or perimeter ditches. In fact, as one approaches the quebrada in which the site is located from the south, the site is highly visible due to the fact that much of the architecture at the site is still standing. Further, many of these standing walls retain tinted plaster on their exterior surfaces which provides a contrast between the color of the surrounding hills and the structures themselves. The brightly colored plaster on many of the exterior walls of the structures at Caldera may have drawn attention to the location (Nelson et al. 2010) from anyone—friend or enemy—seeing the site from a distance. This supports Nelson et al.’s suggestion that this site was not constructed with defense in mind. Nelson et al. (2010:178) have observed that the walls of the visually recorded structures at Caldera bear colored plaster on their exterior walls: seven taupe, four
yellow, and two red. They caution, however, that this particular sample of tinted structures is not necessarily representative because the structures they examined lie in the zone of the site most elevated from the floodplain—our Sector A—where colored (non-taupe) plaster was more prominent (Nelson et al. 2010:178).

Caldera was initially thought by this investigator to be characterized by an earlier occupation followed by Late Intermediate Period reuse as a burial site, particularly the southwestern quadrant, but archaeological investigations carried out for this dissertation disproved this idea. The site has suffered subsequent disturbance by historic and modern looting, graffiti, and agricultural and irrigation (canal) encroachment.

El Carmen

Measuring approximately 13ha in size within the current site polygon (Nelson and Ruiz Rubio 2005), El Carmen is by far the larger of the two sites investigated in this dissertation. It is located about 30 km inland as the crow flies, and it is 1.5km north of the Rio Huaura. Like Caldera, El Carmen is also located in a quebrada. The site has been cut by flooding through the lowest part of the quebrada, and while it has also been damaged by looting, the portions of the site that contain tapial (poured adobe) architecture with embellished doorways (Nelson et al. 2010) are fairly well preserved. El Carmen is a multicomponent site, as indicated by the contrasting architectural types present on the surface. El Carmen contains evidence of at least four distinct construction techniques: (1) adobe tapial architecture (but no adobe brick structures like those found

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3 In fact, due to the new agricultural expansion onto the site-side of the irrigation canal as well as arboriculture within several of the archaeological structures even just in the time between Nelson and After Ruiz’s survey in 2004 and our return to the site in 2009, my colleagues Stacy Dunn and Stephanie Pierce and I submitted a report to the Instituto Nacional de Cultura del Perú to alert the authorities about continued, ongoing, destruction.
at Caldera) in the form of single rooms, (2) architecture that combines adobe bricks/tapial with uncut stones in alternating layers (see Figure 3.6) with multiple layers as an architectural plan (as opposed to rebuilding episodes), though examples of this type are insufficiently intact for assertions about structure layout, (3) fieldstone architecture forming large, internally subdivided compounds, and (4) mound structures which have undergone significant deflation, probably due to their location in the southeastern part of the site and aforementioned flooding episodes. El Carmen’s environs contain what may be a defensive site on the eastern hilltops (see Brown 2008; Brown et al. 2011), but this is not included within the site polygon utilized in this project. Also, Nelson et al. (2010) have noted some later reuse of the stone architecture on the slopes and ridge top around the quebrada.

Though El Carmen is not specifically named, Brown’s team focused on the architecture above the quebrada as a case study. Nelson et al. (2010) noted some later reuse of the stone architecture on the slopes and ridge top around the quebrada.

At the Instituto Nacional de Cultura’s request, for this project the site of El Carmen was divided into sectors as was Caldera. The division of the El Carmen into sectors is roughly based on concentrations of architectural types in different areas of the site.

The tapial architecture with embellished doorways (see Figure 3.7) is located almost wholly at the western edge of the site abutting the hillside, and this area is called Sector A. This sector of El Carmen contains some unlooted rooms. The tapial architecture in Sector A is clustered, and the rooms are approximately 2.5 x 2.5m. There is also an intrusive, presumably later Late Intermediate Period cemetery in Sector A with
a concentration of Chancay Black-on-White pottery. The hillsides abutting Sector A do not appear to show remains of architecture, and the steep grade of the hill is likely the cause of this.

The majority of Sector B, which covers the center of the site, is mostly comprised of larger-scale fieldstone constructions that take the form of compounds with internal walls which subdivide the interior space (see Figures 3.8, 3.9, and 3.10). Many of these structures are readily visible in satellite imagery.

Sector C, on the eastern side of the quebrada, contains a mix of fieldstone compounds, what appear to be remains of built up stone mounds, as well as fragmented remnants of thicker-walled adobe tapial structures. The remains of adobe tapial walls in Sector C are noticeably thicker than the adobe walls and wall segments in Sector A. As is suggested by the map produced during these investigations of the architecture of El Carmen, post-occupational disturbances have rendered both the fieldstone and adobe tapial partially illegible to on-site observers including myself and my mapping team.

Sector D, which is the far northeastern area of the site polygon as the topography rises up the hillsides, has mostly fieldstone architecture with shared walls. In fact, there are remains of stone structures extending up the hills and on their summits on the eastern side of the site. Not all of these areas were included in the 2004 survey performed by Nelson and Ruiz Rubio (2005), and they do not appear on my site maps as these areas were not within the scope of this project.

In terms of layout, El Carmen does not appear to have any central axis, plaza, or other focal point, though of course we are only left with the remains of the final iteration(s) of construction at the site with the addition of centuries of weather and
looting. The collapsed mound structures of earth and fieldstone in the southern parts of Sector B and C may contain clues relevant to what El Carmen’s occupants deemed important or elite. The sprawling remains of the fieldstone compounds that are most noticeably prevalent in Sectors B and D suggest these were likely imposing structures within the site and, possibly, from a distance to the south as well. It is difficult to securely define doorways in long-abandoned field stone constructions due mainly to the nature of the remains being piles of stone. Pauses in the continuation of rows of piled stone were recorded as such but may not all have been actual passageways, so secure statements regarding regularity in the orientation of doorways at the site are not possible at this time.

This project was limited to the *adobe tapial* structures with embellished doorways Sector A and excavations in two fieldstone structures— one in Sector A and one in Sector B. It also included an attempt to date the different architectural types.

A survey of the literature on archaeological investigations in the Huaura Valley suggests that no previous archaeological excavation had been done at El Carmen prior the field work for this dissertation which was carried out in 2009. During their 2004 survey of the Huaura Valley, Nelson and her team created a site polygon for El Carmen which encompassed the architecture visible in the *quebrada* (Nelson and Ruiz Rubio 2004). This decision to map only the polygon containing the architecture at the bottom of the *quebrada* was a conscious decision of members of the survey team that was influenced by the time and resources at the disposal of the surveyors as well as the difficulty of the terrain on the steep hillsides. Stone architecture does indeed continue up the eastern hillsides, and the bulk of this architecture on the slope is not depicted in the architectural map of the site.
This project followed the *quebrada* and focused on the area within the site polygon established by Nelson and her team in 2004 (Nelson and Ruiz Rubio 2005). In fact, a small portion of the hillside architecture left out of the previously established site polygon does appear on the architectural map of the site when overlain with the site polygon. Specifically, this is most visible when one looks at the eastern portion of the site map. An exploration of this continuation of the site would be fascinating, but my mapping team could not focus additional study here as the mapping of rest of the area within the site polygon was more important for the initial research goals of this project and to fulfill our agreement with the Peruvian government which had granted the permit for specific archaeological investigations.

An important difference between Caldera and El Carmen to emphasize here is that the inhabitants of El Carmen utilized the hillsides and ridge top areas surrounding the *quebrada* and built structures there as well (e.g. Brown Vega et al. 2011:1687, Figures 4 and 5). No similar hillside and ridge top architecture was observed at Caldera. The continuation of the architecture at El Camren was not included within the perimeter of the site polygon from the 2004 survey due to the aforementioned time constraints combined with rough terrain. This fact is relevant alongside the fact that later, Brown et al. (2011:1683-84) utilized El Carmen—with emphasis on the construction which continues above the *quebrada* on the hillsides and hilltops—as an example in their ground-truthing study of anomalies in the Huaura Valley, though the site is not referred to as El Carmen (Brown Vega et al. 2011). It should be noted here that, while exploring the continuation of architecture at El Carmen to higher elevations would have been fascinating, it was unfortunately not within the scope of the 2004 valley-wide survey or this dissertation. An
interesting future direction of study would be to consider both the occupations in the
quebrada as well as the construction at higher elevations.

Brown Vega et al.’s study indicates that the hillside and hilltop architecture at El Carmen show evidence that the broader definition of the site’s perimeter (i.e. one that would include the eastern slopes and hilltops) would mean that the site had defensive characteristics (Brown Vega et al. 2011).

The functions suggested by excavations in Sector A suggest the site may have had a ritual component as evidenced by a single room tapial structure in Sector A with a rounded rear wall, embellished doorway, and a cache of multicolored thread between floor resurfacing events within the doorway itself. A hearth feature was found during excavation of a stone structure in Sector A which suggests a residential function. In short, the area within the site polygon for El Carmen (Nelson and Ruiz Rubio 2005) combined with the architecture which continues to higher elevations particularly on the eastern side of the quebrada, indicate various functions including residential refuse, a possible ritual activity incorporated into a re-flooring event in a uniquely shaped tapial structure (Pierce et al. 2010), and defensive characteristics as described by Brown Vega et al. (2011).
CHAPTER 4: ARCHAEOLOGICAL INVESTIGATIONS AT CALDERA AND EL CARMEN

This chapter presents the methods used in the case study site selection, mapping, surface collection, excavation, and the subsequent materials analyses performed in order to better understand the sites themselves as well as address the larger question of political affiliation(s) in the Huaura Valley during the Late Intermediate Period. The Late Intermediate Period dates from excavated contexts at the sites prompted adjustments from the original direction of the project but in many ways made the resulting research more compelling. Fortunately, the same analyses are also sound for evaluating the Late Intermediate Period in the Huaura Valley and how things changed through that period, and there is additional benefit of data from other securely dated Late Intermediate Period sites in the Huaura Valley to which the data from Caldera and El Carmen can be compared (e.g. Brown Vega 2008a; Dunn 2011; Nelson and Bellido Cerda 2010; Nelson and Ruiz Estrada 2010; Pierce et al. 2010; Rutherford 2012, 2014).

The Huaura Valley Sites of Caldera and El Carmen as Case Studies

North of the modern city of Lima, the region of the Central Coast encompasses a sub-region known as the Norte Chico which consists of the Fortaleza, Pativilca, Supe, and Huaura Valleys (Haas, Creamer, and Ruiz 2005). Looking at Andean polities through time on the Central and North Central coasts, Bria points out, “it is crucial that we acknowledge the Norte Chico as a geographic, economic, and social link between these two regions” (Bria 2006).
The southernmost of the four valleys that make up the Norte Chico, the Huaura Valley, had a strategic location as it was situated on the coast of Peru while affording access to diverse environmental zones. The advantageous position of the Huaura Valley as a route to the highlands has been pointed out on several occasions (e.g. Nelson and Ruiz Rubio 2005:4; Shady and Ruiz 1979b:2; Usera Mata 1972:192-193). From this area there were relatively short and manageable paths to the Cordillera Occidental and the jalca area of Junín, the Mantaro Valley, the Chaupihuaranga-Huánuco, el Huallaga, Marañon River, and the jungle to the east (Torero 1974:232). These connections, combined with the river valley’s outlet to the ocean which would have further multiplied the possibilities for communication and trade, even more so via watercraft traveling along the coast, highlight the valley’s multifarious access points to external climatic and geographic areas (Shady and Ruiz 1979b:2). Evidence for maritime trade and contact are not specifically known for the Norte Chico, but given the fact that maritime trade was taking place from Ecuador to Chile as early as 100 BC (Dewan and Hosler 2008), it was likely that the inhabitants of the coastal valleys were utilizing ocean conveyance.

Based on Nelson and Ruiz Rubio’s data gathered in their survey of the valley in 2004 (Nelson and Ruiz Rubio 2005), Nelson et al. (2010) identified a total of 34 sites in the Huaura Valley with purportedly Middle Horizon components. These determinations were based on the presence of adobe (both brick as well as tapial which is poured adobe) architecture with embellished doorways (described in the introductory chapter of this dissertation) (see Figure 4.1) and distinctive red, black, and white pottery known as Huaura Style, which has been attributed to the Middle Horizon (Cruzado Carranza 2008; Vallejo 2010) but extended through the Late Intermediate Period (Vallejo 2010:230).
Aside from pottery and in terms of architecture, Nelson et al. (2010) notes that this particular group of sites in the Huaura Valley “are composed of clusters of individual rooms, of which few are subdivided. The majority of rooms that make up sites share architectural features including embellished entryways, external decorative elements and structures with brightly painted exteriors” (2010:176). These sites are similar in the following ways: (1) they generally are less than 10ha, (2) they, along with similar sites, are fairly evenly dispersed through the valley, and (3) their buildings share similar architectural features (Nelson et al. 2010). (It should be noted that while the site polygon established by Nelson’s team (Nelson and Ruiz Rubio 2004) is larger than 10ha, the areas at El Carmen that contain adobe tapial architecture –Sectors A and D—cover less than 10 ha.)

Based on the most recent survey data from the Huaura Valley (Nelson and Ruiz Rubio 2005) and ideas about Huaura style pottery (Nelson et al. 2010; Vallejo 2010) and clustered single-cell adobe architecture, the Huaura Valley sites of Caldera and El Carmen initially were selected for (1) their resemblance to one another and other similar sites distributed fairly evenly through the valley, and (2) their comparatively good preservation and lack of extensive looting. This is not to say that evidence of looting was absent at the sites. On the contrary, while looting was evident at both sites, they were less looted than comparable sites.

The selection of sites with characteristic architectural and ceramic components was based on the presence of both more permanent features constructed on the landscape such as architecture as well as more portable artifacts like pottery on the sites’ surfaces.
The first was the distinctive adobe (both brick and *tapial*) architecture with embellished doorways (Nelson et al. 2010).

The second component utilized in postulating a time period for these sites was the prevalence of a more portable artifact class, specifically Huaura Style pottery. This Red, Black, and White ware had seeming color and iconographic ties to Middle Horizon pottery from the Wari heartland and was believed to have spanned from the Middle Horizon through the Late Intermediate Period not only in the Huaura Valley but also in the Supe and Pativilca Valleys to the north of Huaura and Lachay (southern slopes of the Doña Maria *quebrada*) and in the Chancay Valley to the south (Vallejo 2010:230-32, 235). Both Caldera and El Carmen also bear Huaura Impressed, Chancay Black-on-White, Huaura style, as well as Red, Black, and White polychromes, including *keros*.

**Caldera**

A detailed description of Caldera can be found in the previous chapter. The site is located north of the Rio Huaura and is about 2 km from the Pacific Ocean. Located in a small *quebrada*, the approximately 1ha, the site is by far the smaller of the two investigated for this dissertation (see Figure 4.2). Nelson et al. (2010) have suggested that the site’s location does not seem to have been selected for its defensive qualities; rather, the use of tinted plaster on the structures at the site may have drawn attention to the site rather than hide it as more subtle earth-toned walls might have. All architecture visible was composed of adobe in one of two forms: adobe bricks, or adobe *tapial*. There were limited examples of internally subdivided architecture. Most structures were single rooms; even if they shared a wall with another structure, there was no passageway
between the cells with the shared wall. The layout of the site did not indicate a central or focal area, structure, or plaza. The site showed evidence of post-occupational disturbances by historic and modern looting, graffiti, and agricultural and irrigation (canal) encroachment.\textsuperscript{4}

**El Carmen**

Measuring about 13ha within the perimeter of the site polygon established in Nelson and Ruiz Rubio’s survey (2005), El Carmen was the larger of the two sites that were investigated and was clearly a multicomponent site, as indicated by the presence of multiple architectural materials, construction methods, and structure plans. The areas containing adobe *tapial* (poured adobe) architecture could be found in part of Sectors A and C, however, so the zones with this architecture were somewhat circumscribed.

El Carmen showed evidence of flooding episodes, especially in the lowest part of the *quebrada*. Flooding events were confirmed by the agriculturalists who live just south at the southern perimeter of the site polygon. El Carmen also had evidence of looting, but the parts of the site with *tapial* architecture — while they have been damaged by looting — (Nelson et al. 2010) are fairly well preserved. Like Caldera, the site of El Carmen was also located in a *quebrada*. An important difference between the two sites was that the inhabitants of El Carmen utilized the ridge top areas surrounding the *quebrada* and constructed architecture there as well.

\textsuperscript{4} In fact, due to the new agricultural expansion onto the site-side of the irrigation canal as well as arboriculture within several of the archaeological structures even just in the time between Nelson and After Ruiz’s survey in 2004 and our return to the site in 2009, my colleagues Stacy Dunn and Stephanie Pierce and I submitted a report to the Instituto Nacional de Cultura del Perú to alert the authorities about continued, ongoing, destruction.
El Carmen was a multi-component site with at least four different construction techniques and structure layouts: adobe *tapial* forming single rooms with embellished doorways, fieldstone structures forming internally subdivided compounds, a few examples of walls made of alternating layers of stone and adobe *tapial*, and mounds of earth and stone which are now largely deflated. The architecture is described in greater detail in the previous chapter.

**Mapping**

Making detailed maps of Caldera and El Carmen was a major component of this project. Previously, Stumer (1952) drew a sketch map of the site of Caldera and Nelson et al. (2010) completed a partial map of Caldera. Nelson and her colleagues used a Trimble PRO XR GPS receiver backpack connected to a Hewlett Packard pocket PC with ArcPad software to delineate the site boundary as well as to map the principle architecture. The same equipment was used in this project, along with a Total Station in order to record topography and architecture.

Ruiz Rubio and Nelson’s 2004 survey team visited El Carmen and mapped only the site boundary with the Trimble GPS backpack, as time did not permit the recording of the extensive architecture (Nelson and Ruiz Rubio 2005). The 2009 fieldwork at El Carmen and Caldera for this project utilized the site polygons for both Caldera and El Carmen that Nelson et al.’s project had registered with the INC.

Since there was no topographic information for either Caldera or El Carmen, and little had been recorded in terms of architectural features (except for the 13 most intact
structures at Caldera (Nelson et al. 2010:177, Fig. 10.5), it was necessary to expand this dataset by creating detailed maps.

In considering how best to approach the mapping of the sites of Caldera and El Carmen, I reviewed a sampling of literature discussing mapping from other archaeological investigations in the Andes for guidance and methodology. For example, of his mapping at the site of Viracochapampa, John Topic (1991:144) stated, “By its very nature, a map incorporates a certain degree of interpretation.” Thus, in order to be as true to the makeup of the sites as possible in this project, every effort was made to record each wall as it actually was visible on the surface in 2009 as opposed to incorporating ideas about what it might have been before the disruption sustained by floods and looting over time.

Along with a few tremendously helpful colleagues, I worked on mapping Caldera and El Carmen between August and October of 2009. I established datums (which were also used as back sights) at both sites, marked them with metal stakes, and recorded their GPS coordinates with the Trimble backpack. Caldera had 3 datums (see Figure 4.3), while the site of El Carmen required 5 datums (see Figure 4.4). I used a Leica TPS Total Station with a Leica 360-degree prism and Leica remote control attached to the stadia rod to map both sites. For software, I utilized the Leica GeoOffice version 3.0.0.0 to transfer the raw data from the Total Station to the computer and export that data as shape files. I then worked with these shape files overlaid on the previously-established site polygon shape files in ArcGIS to complete the maps of Caldera and El Carmen.

Because this Total Station setup did not include onboard GPS technology, it was necessary to get the GPS coordinates for the mapping stations from an external source.
This needed to be done before any work with the Total Station because the coordinates were necessary to enter into the Total Station to set its location in three dimensional space. Data from mapping attempts in August 2009 had to be discarded due to insufficiently specific GPS points for the mapping stations at both sites. This was the result of using handheld GPS units to obtain these crucial coordinates. Significant error was confirmed when the Total Station projects based on the handheld GPS units’ mapping station information were overlain with Arc GIS with the aforementioned pre-established site polygons from Nelson and Ruiz Rubio’s survey. With the handheld GPS data for establishing the Total Station’s position in three-dimensional space, resulting maps inaccurate by seven meters relative to the base map produced from data collected in the 2004 survey. This confirmed that the coordinates provided by the handheld GPS units were erroneous compared with the more-specific points recorded with the Trimble GPS backpack in 2004/2007 by Nelson’s team. These initial mapping attempts proved that sufficiently accurate maps could not be made without obtaining more exact GPS data for each of my datum/back-sight points. Fortunately, I was able to borrow and use the Trimble equipment that had been used in the surveys which had established the site polygons that this project’s maps needed to use as a foundation for its maps. Through this means a much more accurate X, Y, and Z for each datum/back-sight was ascertained. This more precise information was entered into the Total Station and enabled subsequent mapping efforts to be accurate.

The mapping of both sites (see Figures 4.5 and 4.6) was carried out with the same equipment and strategies and only varied in scope because of the goal of producing a detailed map of the architecture at each site (including larger extent of the multi-
component site of El Carmen). The mapping of both sites is described here, only specifying occasional differences between the two mapping efforts when necessary. Though the size and layout of Caldera only necessitated the use of three mapping stations while El Carmen required five, the objectives and methodology were the same:

1. Obtain data for topographic maps of each site.

2. Record all architecture visible on the ground surface at each site. This effort was the first time the architecture of El Carmen had been mapped, though Caldera’s principle architecture had been recorded by Nelson’s team with GPS backpacks previously (Nelson and Ruiz Rubio 2005; Nelson et al. 2010:176, Figure 10.5). Because of the persistent looting and ongoing agricultural encroachment in this area in addition to the inevitable erosion and weathering with time, the mapping of all visible architecture was particularly important for showing the sites as they were in 2009 (before further disturbances and destruction).

3. Designate the boundaries of excavation units, test pits, and cleaned looters’ profiles to show where this project’s archaeological investigation focused. Also indicate the datum associated with each of these units, test pits, and looters’ profiles by which the depths of archaeological features and levels were measured.

4. Mark all locations of dog-and-leash surface collections carried out at each site.

Topographic data were collected differently from the information on the architecture, excavations, and surface collection localities in the Total Station. The Total Station was set to record a point automatically every 0.5 seconds as a team member or I would carry the stadia rod with remote control and prism in transects across the sites. We
also walked the site boundary and as much as we could in the rough and sloped terrain outside the site boundary, which was a difficult task due to the rise in landscape on the edges of the *quebradas* but necessary so that the resulting maps would reflect the *quebrada* topography for each site. I made every effort to avoid looters’ pits or to stand on architecture when recording topographic information, as this would culminate in an inaccurate portrayal of the natural geography.

Once the topographic data were imported into ArcGIS, it was clear that they had to be reduced in order to make legible contours. Far too many topographic points had been collected in the field, but it was certainly better to have too many than too few. In order to reduce the assemblage of topographic points collected into a smaller, meaningful sample, it was necessary to select a random sample from the enormous collection of points. The statistical program Minitab 15 was used to select the smaller random sample of points from the assemblage of topographic points for each site. (Approximately 40,000 topographic points had been recorded for the site of El Carmen, for example, but to produce the topographic map of the site with 1m contours, I only used a random sample of 500 points.) ArcGIS was utilized to make a map of each site showing topographic contours, and the architecture was recorded in a different “layer” by the software.

For the mapping of architecture, a different technique was utilized than the one applied for the mapping of topography. Though the process of collecting a point automatically every 0.5 seconds was maintained, the points themselves were recorded in a different format, in what are called “line files” in the Leica Total Station. A line file is what the name suggests: a series of points connected by a line. They are unlike the
format for the topographic points in that the topographic points were displayed as individual points in the resulting shape files, while the line files utilized to record architecture were represented by lines with dots on those lines to stand for the individual points on a given line. That is, a line file could be named, started, and ended all from the remote control mounted on the stadia rod. After the back sight had been shot in and the machine’s location in 3-dimensional space set with the Total Station in Auto-Track mode, I was able to take over the stadia rod and, by operating the Total Station from the remote control mounted on the stadia road, make on-the-ground decisions about how to map the architecture.

Though this likely seems like an exercise in micro-management, anyone who has mapped architecture in an archaeological setting would understand that there is a level of interpretation (e.g. Topic 1991:144). For instance, there is often a clear difference between a doorway and a post-abandonment break in a wall, and this can frequently (though not always) be clarified by on-the-ground observations. Also, sometimes one face (interior or exterior) of an adobe wall is visible while the other face is eroded. When both faces of a given wall were visible, both faces were mapped; when only face was discernible, only one face was mapped). Data concerning visible architecture were recorded with as much accuracy and detail as was feasible—given modern surface erosion, exposure, and looting episodes—and with as little additional interpretation as possible. That is, the goal was to record the sites and the architecture therein as precisely as possible as they were during fieldwork in 2009. For instance, only for a wall segment which included one side of an obvious entryway (such as an embellished doorway, or at least a break with a finished face), I
would continue the line file, taking points each 0.5 seconds continuously from the first place the wall was visible on the surface of the external side all the way to the internal side. Or, if an adobe brick wall were clearly missing bricks due to post-abandonment disturbances such as looting, I would record the existing face as one line file. I would close that line, and then open a new line file at the next place the wall’s true face became visible again. Because of this meticulousness in mapping architecture as it appeared on the surface when I mapped the sites in August - October of 2009, the maps reflect what was actually present at the sites with no additional interpretation.

Mapping El Carmen’s stone architecture, which dominates Sectors B, C, and D of the site, was particularly difficult because the wall layouts were in many places unclear. This is due to two major factors: (1) flooding of the site which moved stones and (2) the uncut stones used as building material—or at least representing the remnant foundations of buildings—had less clear faces. This made the mapping of the stone architecture at the site less clear-cut than the mapping of the adobe brick and adobe tapial (poured adobe) architecture at Caldera and adobe tapial and adobe-and-stone architecture at El Carmen. Though it was often but not always apparent what were the walls of a structure—or a room within one of these stone structures—we were unable to securely identify many doorways within this type of architecture due to the nature of the piles of stones juxtaposed with the knowledge that the site had undergone several severe flooding episodes. All in all, though, the primary goal in mapping all architecture at the sites was to represent what was on the ground without imposing additional interpretations.
Surface Collection

Because excavation areas were limited by time and budget, ten dog-and-leash surface collections (in which all artifacts are collected within a given radius of a specific point) a 1m radius at each point was done at Caldera, and eleven were done at El Carmen because investigators came across a grouping of pots and sherds presumably left behind by looters. The objective of augmenting excavation with surface collected materials was to gain a more complete understanding of the material culture at the sites. The localities were not strictly random but instead focused on areas of particular density of artifacts or where there was a diagnostic vessel or vessel fragments. Because looters had gathered some materials and apparently piled them up as they decided what artifacts to take and what to leave, the decision of where to do a dog-and-leash surface collection was often determined by a wish to study materials that had already been dug up and exposed by others and which would be further damaged if left to the elements.

This method of collecting aggregations of pottery looters had unearthed but deemed insufficiently fine for collection or sale will have introduced a bias to the data. Overall, though, the surface collected material was helpful for studying the array of pottery forms at the site without additional instances of excavation which is time consuming, obviously invasive, and restricted by the terms of the permit for archaeological investigations granted by the Peruvian government.

At least two surface collections were done in each sector of each site. An additional collection area was added at El Carmen, making the total surface collection localities 11 instead of 10, due to the discovery of an additional cluster of well-preserved
artifacts—three well preserved hollowware vessels, stacked by size, presumably by looters (see Figures 4.7, 4.8 and 4.9).

**Excavations**

Excavations at Caldera were conducted from August to September of 2009, and excavations at El Carmen followed during September and October of 2009. Though the team had spent time at both sites and recognized artifact concentrations and types as well as distributions of architecture prior to excavation, the formal mapping data used in this dissertation was collected while excavations were underway. That said, the decisions about where to excavate at both sites were determined largely based on on-the-ground observations of architecture, artifact surface scatters, and looted areas. Areas dominated by purportedly Middle Horizon architecture and artifacts were a top priority. Excavation units and the single test pit were named and numbered according to the order in which they were opened and the sector of the site in which they were located.

The presence of looting at both sites was both a hindrance and a help. Kent Flannery explains working with disturbed contexts at Barrio del Rosario Huitzo and San Jose Mogote. At Barrio del Rosario Huitzo, archaeologists made use of preexisting of adobe brick makers’ transects to study the site. Though the brick makers’ excavations at the site for raw materials for adobe bricks certainly damaged the site, the damage in this instance provided an invaluable opportunity for archaeologists. That is, the deep 60m transect left by the brick makers’ activities provided a chance for archaeologists to clean the profiles to a flat surface and glean data about mound construction phases that they would not necessarily have had otherwise. This is an instance in which investigators were
able to find opportunity in a situation that is often frustrating for archaeologists. In addition to Huitzo, Flannery also discusses the site of San José Mogote wherein 80% of the excavated contexts were fill or slope wash and only 20% were primary contexts thus, “...if one has no previously cut profile from which to select a place for his initial test pit, *that pit has only about one chance in five of hitting primary contexts*. ... I know of half a dozen formative sites whose whole sequence is based on redeposited fill, and of at least one archaeologist who has done it six times” (Flannery 2009:72, emphasis by Flannery). In this sense, then, such contexts can help guide archaeologists’ selection of where to excavate and provide a look at contexts (e.g. deep in mound constructions) that may otherwise have been inaccessible to them. Further, even when it is not known beforehand that a context has been disturbed and it is realized only after the excavation has begun, the aggregated material in these contexts can in some cases sufficiently augment the artifact assemblage to enable archaeologists to understand the sequence.

Six excavation units were dug at Caldera (see Figures 4.10 and 4.11). Three were dug in Sector A. This was the sector with (1) the highest elevation, (2) the highest-standing preserved adobe *tapial* and adobe brick and mortar walls, and (3) structures with clear examples of subdivided architecture. Because the majority of Huaura Valley structures with embellished doorways are single rooms, it was important to investigate this cluster of subdivided structures in addition to sampling the more common single-room structures at the site. Three units were excavated in Sector C.

The site was divided into Sectors A, B, and C, with Sector A at the highest area of the *quebrada*, Sector B in the middle, and Sector C at the lowest area of the site where the modern canal and agriculture form the current border. Excavations at Caldera
included Units 1, 2, 3, and 4 in Sector A; Unit 6 in Sector B; and Unit 5 in Sector C. At Caldera two 1 x 1 meter test pits and four 1 x 2 meter units were excavated. The two test pits were placed in Sector A, which appeared to be the best preserved area of the site. Because of the aforementioned level of preservation including walls standing nearly 2 meters tall in some places, two 1 x 2 meter excavations were also placed in Sector A. One 1 x 2 meter excavation was positioned within a structure in one of the most intact portions of Sector B. The fourth 1 x 2 meter unit was placed within architecture on the eastern side of Sector B because the western side is a largely looted Late Intermediate Period burial area. The goal of excavating four 1 x 2 meter excavation units distributed through the site of Caldera was to record data that could be used to assess room and structure function in different sectors of the site and to determine whether the differences in adobe architecture at the site correlate with different activities and/or occupation phases.

At El Carmen, three units and one looters’ trench were excavated. Peru’s Instituto Nacional de Cultura required that the site be divided into arbitrary sectors. Sector A, consisting of a wide strip of terrain abutting the western hillside of the quebrada in which the site is located, seems to contain the highest concentration of ceramic sherds with putative Middle Horizon characteristics on the ground surface. In addition to field stone structures, Sector A contained the highest semi-intact concentration of the adobe tapial architecture that, based on the presence of embellished doorways, has been assumed to date to the Middle Horizon in this area (see Nelson et al. 2010).
Two units were dug in Sector A, which was the sector of the site with the highest concentration of purported Middle Horizon architecture. One of these was placed in an adobe *tapial* structure with a uniquely rounded back wall, and the other was placed in a fieldstone structure in order to (1) adhere to Instituto Nacional de Cultura (now called the Ministerio de Cultura) permit requirements which allowed for a specified number of excavation units which could not legally be exceeded; (2) avoid the most-looted areas at the site, many of which coincided with areas of concentrations of adobe *tapial* structures; and (3) try to develop an architectural chronology for the site. The looters’ trench was also in Sector A where an example of the site’s least common construction type—alternating layers of *tapial* and uncut stone—was exposed. One unit was dug in Sector B in stone architecture to try to determine the date of the stone architecture common at the site.

Excavations at El Carmen included two excavation units as well as the cleaning of a looters’ pit in Sector A and a single unit in Sector B (see Figure 4.12). Therefore, Unit 1, a 1 x 1 meter unit, was placed in Sector A, within an adobe *tapial* structure with an embellished doorway. In fact, the unit was placed to encompass the embellished entryway. Also, a looters’ pit displaying evidence of a wall constructed of interlayered stone and adobe *tapial* as a construction technique was investigated as there are only a couple of examples of this construction technique at the site (and none at Caldera), and all of the visible examples of this type of architecture have undergone some destruction via looters’ activities. Still in Sector A, Unit 2, a 1 x 2 meter excavation unit was placed further south in the corner of a building made of uncut stone. In Sector B, Unit 3, a 1 x 2 meter excavation unit was placed in what appeared to be a well preserved fieldstone
compound. Primary goals of the excavation strategy employed at El Carmen were to help determine the timing of stone versus adobe tapial architecture at the site as well as to test for any differences in activities that may have been carried out in structures built with varying materials.

Excavation units were viewed in terms of levels and features within or including those levels. Stratigraphic excavations were done by natural/cultural levels instead of arbitrary levels. The only exceptions to this occurred when a deposit was more than 15 cm thick, in which case the layer was subdivided in order to gain a better understanding of variation, if any, in artifact deposition. All excavated sediments were put through a $\frac{1}{4}$" screen. The matrices from more delicate features, including a hearth-like feature at El Carmen, were put through a $\frac{1}{8}$" screen. All artifacts were sorted and bagged by unit, material type, and level and/or feature. Each bag was labeled both on the outside of the bag as well as a tag inside the bag with the following information: project initials and year, site name, sector, unit, level and/or feature, material, excavator’s initials, bag number, and date of excavation. At the end of each day we transported all collected artifacts back to the lab house for processing and curation.

**Architectural Observations**

A brief study of the architecture at both sites focused on data that could be gleaned in a noninvasive way—through on-the-ground observations noted while walking around the site, mapping, and examining looters’ pits—combined with the view of walls and their foundations that were visible within excavation units. This architectural study focuses on two levels. The first was a general overview of the larger picture, specifically
site layout and form. The second level focused on architectural details such as construction techniques and structure components.

In order to address the first and broader level of architectural study, the architecture of the Huaura Valley sites of El Carmen and Caldera were mapped with specific attention to site layout, the distribution of structures, and topography. This clarified questions of site size, site setting, and general organization of structures, and produced maps which provided information difficult to envision from the ground.

The second level of architectural analysis focused on more specific aspects of adobe architecture with embellished doorways. Detailed analysis was carried out on a sampling of standing and partially standing structures at each of the two sites. Room shapes and sizes were recorded, as were building materials and construction methods. In addition, this analysis concentrated on the presence or absence of, surface treatment, of walls, degree of preservation, internal features such as niches and benches, and the possible significance of what Nelson et al. (2010) have called the embellished doorway.

**Pottery Analysis**

Ceramics were the most prevalent artifact type encountered in excavations and surface collection at El Carmen and Caldera. Because the pottery from the Huaura Valley, especially the Huaura Style, has not been systematically studied and dated, no established ceramic typology exists for this area. A full chronology was not within the scope of this research, but ceramics from surface collections and excavations at El Carmen and Caldera may contribute in the future to the establishment of a chronology for the valley.
Attribute analysis was applied to the ceramics excavated and surface collected at El Carmen and Caldera. A systematic approach formulated (written and coded) by Kit Nelson, Stacy Dunn, and me was used in order to facilitate intra- and inter-valley comparisons. The attributes of each sherd, such as firing environment, finish, iconography, temper, and form were recorded. The analysis rubric and coding sheets utilized in this study are included as an appendix to this dissertation.

Diagnostic sherds were drawn and photographed, and many non-diagnostic sherds were also photographed as well in order to gather as much information as possible from the assemblage which had to be returned to the Intituto Nacional de Cultura in Peru in adherence with the terms of our permit for archaeological investigations. The results of this analysis are complemented by a series of radiometric dates from the following units and levels at Caldera: Unit 4, Level 3; Unit 5b, Level 2; Unit 5b extension, Level 2. From El Carmen, samples from the following units and levels were sent for AMS dating: Unit 1, Levels 3 and 5; Unit 2, Levels 2 and 3; Unit 3, Level 2. These contexts are discussed in greater detail later in this chapter. While recording such information is important in itself, a crucial aspect of this research was to get an understanding of the association of Huaura Style pottery, architecture with embellished doorways, and the relationship between these and the fieldstone architecture that is present at El Carmen.

**Botanical, Pollen, Shell, and Textile Analyses**

Because botanical, pollen, and shell analyses are specialized forms of analysis, each requiring its own characteristic training and practical experience, these analyses were performed by experts in their respective disciplines.
Botanical analysis plays an important role in archaeology in determining what kinds of plants people were growing, consuming, and otherwise utilizing. This analysis can also help determine specific activity loci, such as cooking or food preparation areas, present at a site. Botanical analysis was carried out by licensed archaeologist, Enrique Bellido Cerda, who has extensive experience in botanical analysis including all the botanical samples collected by Nelson’s 2007 (Nelson and Ruiz Rubio 2007) excavations in the Huaura Valley (Nelson and Bellido Cerda 2010).

A total of 42 bags of excavated botanical remains, 29 from Caldera and 13 from El Carmen, were submitted to Bellido Cerda (of Nelson and Bellido 2010) for analysis. These samples were selected from the best contexts excavated at each site. From Caldera they represent Units 1, 3, and 4 from Sector A and Unit 5 in Sector C. At El Carmen they represent Units 1 and 2 as well as the cleaned looters’ trench from Sector A and Unit 3 from Sector B. The resulting report by Bellido Cerda is included in this dissertation as an appendix.

Pollen analysis provided complementary data to that provided by macrobotanical analysis. Pollen analysis was performed by licensed specialist Luis R. Huamán Mesía, Coordinador of the Laboratorio de Palinología y Paleobotánica, Herbario HUPCH "Magdalena Pavlich." Samples for pollen analysis were collected from features such as occupational surfaces (floors) during excavations. The samples intended for pollen analysis were collected with cleaned tools. Five samples were sent to Lic. Huamán, These represent Feature 19 from Caldera Unit 5a in Sector C; Feature 2 from Unit 4 in Sector B at Caldera; Features 46 and 31 from Unit 1 in Sector A at El Carmen; and
Feature 49 from Unit 3 at El Carmen’s Sector B. The resulting data from the analysis conducted by Huamán Mesía is included in this dissertation as an appendix.

Analysis of shells excavated at Caldera and El Carmen indicated the kinds of maritime resources used at the sites and generally in what quantities they were used. Thirty-three bags of shell, none weighing more than 73.2 grams, were sent to shell specialist Carol Rojas Vega for analysis. These samples represented units A1, A4, C5a, and C5b at Caldera; and A1, A2, and A3 at El Carmen. Rojas Vega’s report is included in this dissertation as an appendix.

Though no human or faunal bones were found in undisturbed burial contexts, there were some osteological remains recovered during excavation. Erin Patterson, a Tulane University Ph.D. student trained by Dr. John Verano and with experience in analyzing Pre-Columbian remains in Peru, analyzed the osteological material. The bulk of the data is too large to present in this dissertation, but is available upon request.

**Radiometric dating**

Radiometric dating is one of the most efficient and accurate ways of obtaining calendrical dates of occupations and their associated artifact assemblages, which is also crucial for understanding specific occupations’ temporal relationships with other sites. In terms of this project, radiometric dating had two major goals: (1) to obtain absolute dates associated with pottery styles in the area for which no ceramic chronology exists, and (2) place the Huaura Valley sites of Caldera and El Carmen into the cultural sequence of the Norte Chico. Eight samples from excavated contexts at Caldera and El Carmen were selected and samples were exported to the United States for processing. The Center for
Applied Isotopic Studies at the University of Georgia in Athens, Georgia, was the laboratory selected to process these dates using Accelerator Mass Spectrometry.

Because of the cost of analyzing samples for radiometric dating, samples were chosen carefully to include those associated with occupational surfaces within buildings. (Ideally, these were contexts that were also associated with pottery, but this was not always possible.) This was particularly applicable with El Carmen, Sector A, Unit 1, which was dug in the embellished doorway of an adobe *tapial* structure and exhibited four floors associated with this architectural feature. Seeds and charcoal were collected from a hearth feature in Sector A at El Carmen, and a sample of wood was collected from a possible living surface within a fieldstone structure in Sector B. Samples from Caldera included carbon from charcoal, plant fragments, and a seed from floors encountered in excavations in Sectors A and C.

**Excavations**

In order to address original research questions regarding the interaction between Middle Horizon people of the Huaura Valley and better known, powerful polities elsewhere in the Andes at the time, targeted excavations and surface collections were carried out at Caldera and El Carmen, sites chosen as a representative sample for their similarity to one another and other sites in the area as well as their relatively good preservation. Both broad scale (i.e., site layout) and more focused architectural analysis were conducted. Ceramic analysis was carried out in order to gain a better understanding of the ceramic assemblage for the valley with particular attention to Huaura Style and its relative and chronometric dating. Finally, AMS dates on samples from intact contexts at
Caldera and El Carmen help hone the architectural and ceramic chronologies for the area as well as to date these sites relative to broader cultural development in the prehispanic Andean world.

This section provides descriptions of the excavations carried out at Caldera and El Carmen in 2009. It also presents results of some of the materials analyses in order to provide a clear picture of the sites and the samples’ proveniences. Results from samples tested via AMS dating are reported here as uncalibrated radiocarbon dates.

A more detailed discussion is offered of pottery found in excavated contexts as well as surface collections at Caldera and El Carmen in the next chapter, and this is followed by a discussion of the chronology for the sites based on the data collected during fieldwork.

The reports from analyses on bone, shell, pollen, and botanical samples carried out by external experts are included as appendices. Finally, a contextualization of the Huaura Valley is offered within the Norte Chico and in light of the better known Late Intermediate Period polities of Casma, Chimú, and to a lesser extent, Chancay.

The reasoning for the selection of the Huaura Valley sites of Caldera and El Carmen as sample sites for this research and the methodology utilized in excavations, dog-and-leash surface collections, and cleaning of looters’ profiles has been described previously in this dissertation within the chapter on methods. This section describes the specific contexts encountered in the excavations themselves.

With the goal of confirming the relationship between the distinctive architecture with embellished doorways, pottery style(s), and associated chronometric dates, the placement of excavation units at the sites of Caldera and El Carmen was determined
based on quality of preservation as perceived by the researcher, relative lack of looting, and presence of architecture types including embellished doorways. Horizontal excavations were not an option for various reasons including time, resources, and the parameters of the excavation permit granted by the Peruvian government. Instead, smaller excavation units of 1x1m and 1x2m were dug in strategic locations. The data collected from these excavations was augmented by 10-11 dog-and-leash surface collections at each site. At the site of Caldera, six units were excavated. At the site of El Carmen, three units were excavated and one looters’ trench cleaned.

Excavation units at Caldera is discussed first, followed by those at El Carmen. Despite the care taken in determining the specific excavation coordinates, some excavation units turned out to have been placed in disturbed contexts. This was not surprising given the long history of looting and episodes of flooding at the site (though Kent Flannery’s discussion of material collected from such contexts at the Mesoamerican site of San José Mogote showed that even material from non-primary contexts can be crucial for helping build the chronology of a site [Flannery 2009]). Even when the context was realized to have been disturbed, excavation in these units was continued in this location for multiple reasons, including: (1) the hope of encountering less disturbed contexts below, and (2) because the Instituto Nacional de Cultura of Peru gave permission for the excavation team to open only a specific number of units at each site. In the descriptions of the excavation units, instances of disturbed contexts are noted.

Though much of this information on the 2009 archaeological investigations at Caldera and El Carmen can be found in the official report submitted to the Instituto Nacional de Cultura (now the Ministerio de Cultura) of Peru (Pierce et al. 2010), the
information is presented is a translated and augmented form in this dissertation in the hope that it will be more accessible to anyone who may wish to review the data.

Caldera, Sector A, Unit 1

Figures 4.13-4.17

This unit was placed in Sector A over the embellished doorway of the topmost structure at the site of Caldera. The adobe structure was one of a few of the examples of a subdivided space at the site. The *tapial* was thin compared to that found at Quipico, but the space was subdivided, which is typical at Quipico (Pierce et al. 2010). The unit contained the frontmost external corners of the embellished doorway, and thus structure walls were within the unit. The focus of the excavation was to detect any floors, occupational surfaces, or any special treatment an embellished entryway might have received. The unit measured 1m north-south and .90 east-west due to the width of the space between the walls.

Evidence of looting was visible on the surface. The color of the matrix was Munsell 2.5Y Light Brownish Gray with a sandy loam texture. The surface was uneven with the north section of the small unit higher than the south side, likely due to looters’ back-dirt from a search for archaeological materials elsewhere. Importantly, part of an elongated rock was visible on the surface, and it is speculated that this may have been a lintel over the entrance when the structure was in use. There was no change in matrix color or texture in the first level of excavation which yielded material that had been disturbed previously and abandoned by looters.

Level 2 was an arbitrary subdivision of Level 1 which was thick due to the aforementioned looters’ back dirt and contained no change in texture or color. Levels 1
and 2 yielded a significant quantity of remains including insect larvae, lucuma seeds, corn and pacae leaves, stems, and insect pupae.

Below Level 2 the excavator encountered a sterile matrix which consisted of semi-compact silt and gravel. The excavation unit included no in situ cultural materials other than the wall segments that were visible prior to excavations. The materials excavated from this unit should thus be considered in a similar fashion as surface-collected materials which will be discussed later.

Caldera, Sector A, Unit 2

Figures 4.18-4.45

This unit was located in Sector A in the southeast corner of a structure made of adobe bricks which were then covered with plaster and painted. The structure is one of the largest at the site, measuring approximately 10.5 meters on a side. It is also the second highest in elevation at the site. Only a few of the many structures present at Caldera exhibited clear evidence of internal subdivisions; thus it was decided that at least one of these structures should be investigated. Because of its location, size, and internal subdivisions (it contained at least three rooms), this structure was identified as an important area to investigate. Though an area of the structure with the least evidence of obvious looting was chosen for the placement of a unit, it soon became clear that this area had been looted as well.

The unit initially measured 1m N-S and 1m E-W. However, because a large adobe piece was found in Level 1 and could not be worked around, the unit was expanded by 50cm to the north to accommodate and remove the adobe which had probably fallen there (or tossed there by looters) so that the excavation could be
continued. So, though the unit was begun as a 1 x 1m excavation, it was expanded early on and then remained a 1.5 x 1m excavation. The unit did not align with the cardinal directions but instead with the walls of the building. The NE orientation is approximately 28 degrees east of north (or 28 degrees), and the EW orientation is 34 degrees south of east (or 124 degrees). Datum 2, located about 30cm northeast of the northeast corner of the unit and measuring 10cm from the ground surface, was used to measure elevations of levels. After a unit wall collapse during the excavation of Level 9, Datum 2 was replaced by Datum 5 at a distance of 120 cm from the northwest corner of the unit. Datum 5 is 20cm higher than Datum 2 was, making Datum 5 25cm from ground level. After the incident of the wall collapse, the excavator removed the collapsed material, screened it as usual, sorted it by materials, and placed it in bags labeled “muro caido.”

The superficial level of Sector A, Unit 2 at Caldera was loose, not compact. The texture was loamy sand, and the color was Munsell 2.5Y 6/2 Light Brownish Grey. No material was collected from this superficial layer. There was no change in elevation in this level; excavation began with the removal of this level to expose the top of Level 1.

Level 1 was sand in texture and represented a combination of looters’ back dirt and wind-born deposits of ash from the burning of cane fields that currently exist just south of the site. Its color was Light Grayish Brown (code Munsell 10YR 6/2). The matrix included many chunks of adobe, usually about fist-sized, as well as patches of ash likely deposited as a result of the burning of cane fields below the site in historic and modern times. During the excavation of Level 1, excavators encountered a large chunk of painted adobe tapial Munsell 7.5Y 5/8 Strong Brown in the northern portion of the unit. It initially appeared to be 40cm long, but it was not fully exposed because it was lodged
in the northern wall of the excavation. It would have been difficult and later dangerous to continue excavating around this adobe, so the decision was made to expand the N-S dimensions of the unit by 50cm in order to expose and remove this adobe, which, when uncovered, was about 80cm x 65cm in size.

Level 1 was very thick (and actually encompassed what the excavator called Level 2, which will be discussed later), varying from 45cm thick in the southeast corner to 97 cm in the northwest corner. Materials and samples collected from this level include the following: ceramic, wood (including fragments of the paddles used to stir chicha and/or support mummy bundles), bone, human hair, matrix, quartz, a sample of adobe, lithics, metal (a modern/historic nail), corn, shell, cotton, textile fragments, feathers, coprolites, and cane. It should be noted that the context of these materials was looters’ back dirt.

Sector A, Unit 2 was placed in the interior of the southeast corner of the structure called Feature 4. Feature 4 is the second highest structure at the site which is located in a sloping quebrada. The structure contained at least three rooms based on the wall fragments still in place. The longest preserved exterior wall, the east wall, measured approximately 10.5m. The walls in this structure were constructed of adobe bricks of approximately 26cm x 9cm x 15cm which were then faced with plaster. Mortar was placed between the bricks with a thickness of about 3cm. The plaster which was smoothed over the bricks was tinted or painted. The exterior walls were approximately 50cm thick, and interior walls were approximately 43cm thick. There was one exterior, embellished doorway still present. It is in the middle of the southernmost wall and opens
to the south and downslope. Remains of two more doorways were visible within the structure.

Feature 9 consisted of a compacted area in the southwest corner of the unit at a depth of 116cm below Datum 2. It adjoined the lower part of wall Feature 4. It was small in size, measuring ~13cm N-S and 10cm E-W. The excavator does not believe Feature 9 was a floor, but it may have been support for a floor which was since destroyed. A sample of the matrix of Feature 9 was collected during the excavation of Level 6.

Level 2 should be considered one and the same with Level 1, as Level 2 was only begun as an arbitrary division because Level 1 was very thick. Because the thickness of the deposit was much greater than anything else encountered at either site, it was deemed reasonable to subdivide the level into two as a precaution which would allow investigators to differentiate between earlier and later material deposition if needed later on. However, the excavator abandoned this plan. Though 5 buckets of dirt matrix and the aforementioned artifacts and samples were labeled as being part of Level 2 in the documentation, all of Levels 1 and 2 should be considered a single zone of deposit. Artifacts and samples collected and labeled as coming from Level 2 include cotton, bone (possibly guinea pig), botanical remains, sample of the matrix, sample of ash, textile, feathers, lithic, corn, and ceramic. The context of this excavated material was, again, looters’ back dirt.

Level 3 was a very thin layer, varying from 2-3cm in thickness, of sandy clay loam. Samples of matrix and paint were collected from Level 3/Feature 10, as were wood, botanical remains, and ceramic. Its level of compaction, semi-compact, was
slightly higher than that of the previous level. The color of the matrix of level 3 was Munsell 10Y 6/3 Pale Brown.

A fragment of plaster found underneath the adobe *tapial* piece the excavation team removed, revealed a deposit of compact, plaster-like material. Located in the northeast corner of the unit, Feature 10 is represented in the drawings of Levels 3, 4, and 5. It measured ~54cm E-W and 61cm N-S and was thought to be construction fill under a subsequently destroyed floor. Feature 10 was located at a depth of between 116cm and 120cm below Datum 2. Samples of the matrix of Feature 10 were collected. Two samples of carbon, which were not submitted to the lab for analysis, were collected and stored. The first was extracted from 26cm from the east wall of unit, 17 cm from the north wall of the unit, and 106cm below datum 2. The second was from 40cm from the east wall of the unit, 14cm from the north wall of the unit, and 113cm below Datum 2. Wood, textile, ceramic, and lithic artifacts were also collected during the excavation of Feature 10.

After removing Level 3 including the upper portion of Feature 10, excavators reached a change. Level 4, which was approximately 14cm thick, was found. Excavators found a concentration of orange paint and soil that was even more compact than the topmost portion of Feature 10. Two samples of carbon and one sample of matrix were collected from Level 4/Feature 10; the samples of carbon were not submitted to the lab for analysis. Wood, textile, ceramic, shell, and lithic were also collected from Level 4/Feature 10. Level 4 was a portion of Feature 10 that was slightly more compact than the portion removed in Level 3. The color of the matrix of Level 3 was Munsell 10Y 6/3 Pale Brown.
After completing the excavation, drawing, and photographs of the base of Level 4, only 2 more centimeters were removed before another change was encountered. Immediately beneath Feature 10 was Feature 11, a level of more compacted material. There was little change in color from Level 4, but Level 5/Feature 11 was much more compact than Level 4/Feature 10. No bags of artifacts were collected from Level 5, and only 1/3 bucket of matrix was removed. Photographs of the base of Level 5 were taken, but there is no formal drawing because such a drawing would have merely duplicated the drawing for the previous level.

Feature 11 consisted of a more compacted area along the interior edges of the southeast corner of wall Feature 4 in which Sector A, Unit 1 is located. Feature 11 is overlain by Feature 9 in the southeastern corner of the unit and by Feature 10 in the northeast area of the unit. So, Feature 11 follows the base of the wall Feature 4 but also extends into the unit as well. Feature 11 probably represents the remains of a fill or support for a floor which has been destroyed. At its widest, Feature 11 was about 20cm wide, and it is about 9cm wide at its thinnest point. Samples of the matrix from Feature 11 were collected during the excavation of Level 7 and were stored in bags 342 and 343. Lithics and ceramic artifacts were also collected from Feature 10, as were shell and botanical remains.

Level 6 consisted of the contents of Feature 9 in the interior of the southeast corner of the building in which the excavation unit is located. This exposed all of Feature 11 which actually adjoined the south and east interior sides of Feature 4 (the structure wall). At the end of Level 6, Feature 9 is completely gone. No artifacts were found in this level, but a sample of compact earth from Feature 9 was collected. The matrix was
compacted, and its texture was silty clay loam. The color of Level 6 was Munsell 2.5Y 6/2 Light Brownish Gray.

Level 7 consisted of the contents of Feature 11. Level 7 was approximately 4cm thick. A total of 2.5 buckets of matrix were removed during the excavation of this level. Artifacts included lithics, ceramics, shell, and botanical remains. After removing Feature 11, excavators encountered a harder layer immediately beneath which is Feature 14. The matrix was compact, and its texture was loamy sand. The color of Level 7 was Munsell 2.5Y 6/3 Light Yellowish Brown.

Feature 14 consisted of the compact material adjacent to the lower portion of wall Feature 14. It was found underneath Feature 11 and had similar dimensions as Feature 11, though Feature 11 did not extend into the northern zone of the unit away from Feature 4. Feature 14 was located at a depth of between 115cm and 124cm below Datum 2. It varied between 5cm and 25cm. Also like Feature 12, Feature 14 seemed to represent an additional preparation/fill for a floor which was since destroyed. A sample of the matrix of Feature 14 was collected during the excavation of Level 8.

After the removal of Feature 11 during the excavation of Level 7, the focus of excavation during Level 8 was to remove Feature 14 which the removal of Feature 11 had exposed. Level 8 was approximately 13cm thick and had a darker, smoother matrix. Ceramics, lithics, and botanicals were also collected during the excavation of Level 8. The matrix was compacted sandy loam. The color of Level 8 was Munsell 2.5Y 6/3 Light Yellowish Brown.

After removing Feature 11 during the excavation of Level 8, excavators decided to continue digging until they reached a change. Artifact density became lower, but the
unit had not become sterile. Level 9 was approximately 60cm thick. Unfortunately, due to the looseness of the matrix in the unit walls, the northwest corner of the unit collapsed. Photographs had been taken at the end of Level 8 and were taken again after the unit wall collapse which occurred during the excavation of Level 9. Twenty-six buckets of matrix were removed to regain the level at which Level 9 had been before the collapse. Two large pieces of tinted adobe were found. The tint on the adobe was Munsell 7.5 YR 7/8 Reddish Yellow and looked very similar to the tint on the standing walls of Feature 4. Fifteen bags of artifacts and samples were collected during the cleanup of the unit wall collapse which occurred during the excavation of Level 9. Items collected included cotton, textile, lithics, feather, botanical remains, bone, coprolites, shell, ceramic, seed, wood, metal, bone (possibly guinea pig), and a human tooth. The sample of matrix collected measured 1.5L. The soil type was sandy loam. Its color was Munsell 10YR 6/3 Pale Brown.

Level 10 was approximately 36cm in thickness. Human bone, cotton, feather, human teeth, textile, bone, seeds, ceramic, botanical remains, cuarzo, and a sample of the matrix were collected from Level 10. The texture of Level 10 was sandy loam. It was Munsell 2.5Y 6/4 Light Yellowish Brown in color. Though the color and texture was uniform throughout, the compactness of the matrix in the northern half of the unit is harder than that in the southern half of the unit. Eleven buckets of matrix were removed during the excavation of Level 10. Feature 10 was in the area of looser matrix.

Feature 16 was a ~28cm fallen piece of adobe encountered underneath the base of the eastern portion of the wall Feature 4. Because Feature 16 was in an area of loose matrix, excavators believe this to have been a looted context and not construction fill.
Textile fragments, lithics, human bone and skin, cotton, a human tooth, ceramics, botanical remains, shell, and a sample of matrix were collected from Level 11. Ten buckets of material were removed during the excavation of Level 11. The texture of Level 11 was sandy loam, the same as Level 10. It was Munsell 2.5Y 6/4 Light Yellowish Brown in color.

The excavator decided to stop excavating because (1) continuation would be dangerous because of the falling unit walls due to loose matrix and (2) it became abundantly clear that the whole unit had been a looters’ trench with some remains of floors and construction fill abutting the interior walls, so continuation would not have been worthwhile. Excavations had proceeded about 70cm below the foundation of the building Feature 4 in the attempt to reach sterile soil. Though during excavations various samples were curated for possible AMS dating, samples from other excavation units with more secure contexts were selected for testing.

Excavators found two entire vessels and many other artifacts, but the unit walls, even at a depth of 2m, threatened to bulge out and collapse into a rounded form, which led the investigator to conclude that these artifacts were not an offering or construction fill, but instead the result of looters trenches/tunnels. (In fact, two looters’ pits can be seen on the other, exterior, face of the wall that forms the border of this excavation unit. Prior to the excavation of this unit on the interior side of the wall, however, it was thought that the depth of these looters’ pits on the other side of the wall was less than the depth of the foundation of the building and therefore would not have affected the preservation on this side of the wall.) The depth of the unit was 2.4m below Datum 5 (equivalent to Datum 2 plus 20cm).
Further unit wall collapse occurred during the drawing of the profiles (and was photographed), but the unit was cleaned, and drawings were adjusted to represent the final view of the profiles. Artifacts were divided into groups and labeled as coming from “wall collapse during excavation of Level 11.” Not surprisingly, the dimensions of the unit at the bottom of Level 11 are significantly smaller than the originally planned 1.5m (N-S) x 1m (E-W) unit size due to various wall collapse events and the greater than 2m depth of the unit.

It could be said that the excavation of this unit was not useful because it was looters’ back dirt, but it should be reiterated that a small section of floor foundation (Feature 9) was found in the corner, and excavation of this unit also provided a view of the foundation of the tapial structure which was a subdivided structure in a site where most structures are single rooms.

**Caldera, Sector A, Unit 3**

Figures 4.47-4.60

The excavators placed Unit 3 abutting what appeared to be an adobe tapial retaining wall measuring 1m x 1m at the beginning of excavation. It was excavated in six levels. The surface was margosa arena or loamy sand in texture and Munsell 2.5Y 5/3 Light Olive Brown in color. No cultural material was found on the surface.

Level 1 consisted of matrix which had been disturbed by looters and was approximately 50cm of looters’ back-dirt, but excavations continued with the hope that less disturbed material was below. Level 1 was also margosa arena, Munsell 2.5Y 6/2 Light Brownish Gray Color. The discovery of textile material embedded in the profile of
the unit necessitated the extension of the unit by 10 cm to the southeast. In addition to
textile material, the level also yielded pottery, bone, shell, lithics, botanicals, wood, seed,
cotton, metal, beads, human hair, and coprolites. Again, as the loose matrix contained an
abundance of fragmentary cultural material, it was thought that this level was back-dirt
from looters’ search for sellable goods.

Feature 3, the foundation of the thick adobe *tapial* wall that the excavation unit
abutted, became visible during the excavation of Level 1. The foundation of the wall
showed remnants of yellow paint (Munsell 2.5Y 8/3 Pale Yellow), which is a common
feature on the structures at Caldera. The condition of the paint was good with only some
erosion on the outer and upper surface of the wall which had obviously been exposed in
previous times.

The excavation of Level 1 also exposed Feature 6, a flat, compact surface that was
present only in the north and east corners of the unit. The occupational surface (Munsell
2.Y 3.8 Pale Yellow in color) was below the wall (Feature 3) and therefore predated the
wall and its foundation. The compact surface that was Feature 6 may be a surface
prepared prior to the construction of the retaining wall. Perhaps the mud surface was
prepared for the construction of the thick *tapial* wall, or perhaps it was the result of the
construction of the wall. No cultural material was found directly associated with the
occupational surface.

Level 2, with a thickness of approximately 40 cm, also consisted of matrix that
had likely been disturbed by looters. Excavators encountered a change in the texture of
the matrix to Light Yellowish Brown (color Munsell 2.5Y 6/3) arena margosa with a
notable increase in the quantity of pebbles within the matrix. This level yielded less
cultural material than the level before it. Pottery, bone, shell, botanicals, wood, seeds, cotton, textiles, gourd, coprolites, and animal hair were found during the excavation of Level 2. Three adobe bricks were also found in this level, and it was postulated that these were from a landslide or looters.

Level 3 was approximately 20cm thick and also appeared to be matrix from a disturbed context, though the matrix was slightly more compact than that of the prior two levels. The matrix was sandy loam, Munsell 2.5Y 5/3 Light Olive Brown color. The quantity of cultural material collected during the excavation of this level was less than that from Level 2 but included pottery, bone, shell, lithics, botanicals, wood, cotton, textiles, and coprolites. Five adobe bricks were found, some continuing from the previous level, as well as a large rock and a pottery fragment; the distribution of these finds suggested deposition by looters.

Level 4 was 13cm thick and consisted of yet more loose matrix from a disturbed context. The texture was loam in Munsell 2.5Y 6/3 Light Yellowish Brown. This level yielded less material culture than the above layer, and this included bone, shell, lithics artifacts, wood, seeds, cotton, textiles, coprolites, and cotton mixed with straw. In the southwestern part of the unit, several adobe bricks were encountered, and the excavator surmised that these had been placed there during a landslide or a disturbance such as through looting.

Level 5 was also likely looters’ back-dirt like the layers above it, but this 20cm level was more compact loam in Light Yellowish Brown (color Munsell 2.5Y 6/3) and contained pottery, shell, lithic artifacts, botanicals, wood, cotton, textile fragments, and coprolites, though the cultural material was more sparse than in previous levels.
Level 6 consisted of sterile matrix about 20cm thick Munsell 2.5Y 6/3 Light Yellowish Brown loam. The matrix was more compact with more rocky inclusions than previous levels, but no cultural material was encountered. Because of matrix collapse, the unit measured 1m x 1.10m at the end of the excavation.

Though Unit 3 consisted dominantly of looted material, it was beneficial to expose the foundation of the *tapial* wall feature to learn more about construction techniques at the site.

**Caldera, Sector A, Unit 4**

Figures 4.61-4.76

Unit 4 was in the south-east corner on the exterior side of the structure wall (Feature 1) and near a looters’ pit. In the nearby looters’ pit, several layers of compact, flat earth were visible that did not follow the sloped topography of the site, which suggested excavators might encounter occupational surfaces within the excavation unit. This unit began with 1m x 1m then a 15cm extension was made to the south.

The surface appeared to have been deposited by wind and was 10YR 5/3 Brown in color. Feature 1 was a wall that was part of the adobe *tapial* enclosure located in the northern portion of Caldera.

Level 1 was characterized by a semi-compact matrix of sandy loam Munsell 2.5Y 5/2 Grayish Brown in color. It was believed to have been deposited by running water such as in a flood flowing around the exterior corner of the wall (Feature 1). The matrix contained small gravel. A floor (Feature 2) adjoining the exterior corner of wall (Feature 1) was found. Because of this, the 15cm extension was made on the south side of the unit as Feature 4, the exterior wall of another structure to the south, in order to determine if
the floor was associated with both structures. Pottery, bone, lithic material, and metal were found during the excavation of Level 1, as well as insect larvae and remnants of peanuts.

As the space between wall Features 1 and 4 was fairly narrow, excavators wanted to know if it was in use when both structures were occupied or if the higher structure — of which Feature 1 was a part — was possibly closed off after the later construction of the lower structure of which Feature 4 was the uppermost exterior wall. The space between the parallel exterior walls (Feature 1 and Feature 4) appeared to have been a kind of alley between the two structures.

On top of the floor (Feature 2), there was a fallen adobe brick deposited in the center of the passageway. This brick was believed to have fallen into the passageway after it was abandoned. It was determined that Feature 2, the compact floor (color Munsell 10YR 7/2 Light Gray), was also associated with the north wall of the lower structure (Feature 4), so it seems safe to posit that the space between these two structures was once an alleyway that was utilized during both structures’ occupations. This was interesting given the fact that the embellished doorway in which Unit 1 was excavated and shares the perimeter wall Feature 4 — apparently faced directly onto the back wall of the structure immediately to the south.

Level 2 consisted of the contents produced by excavation of the floor (Feature 2) which excavation showed to be only 1cm above the next floor, Feature 7. The earlier floor (Feature 7) below the Feature 2 floor also adjoined the north wall, Feature 4. Feature 7 (Munsell 10YR 6/2 Light Brownish Gray) was a very compact surface which was what led excavators to call it a floor. It was so solidly compact, in fact, that the
Feature 7 floor could not be excavated with a trowel, so a small archaeological pick was used in order to excavate through it. A sample of charcoal was recovered during the excavation of Feature 7. This sample was submitted to the Center for Applied Isotopic Studies at the University of Georgia as CAIS 9871, and result from AMS dating was 620 ± 20 B.P.

The excavation of the Feature 7 floor uncovered Feature 8, a concentration of Pacay leaves deposited at the exterior corner of the Feature 4 wall. This deposit may have been a purposeful deposit or offering prior to the construction of the floor, Feature 2. The deposit of Pacay extends through the unit, and the loamy (Munsell 10YR 6/3 Pale Brown) matrix contained a mix of branches and leaves of Pacay with loose compaction.

Level 3 consisted of the excavation of the concentration of Pacay plant material (Feature 8) and the Feature 7 floor in order to expose the base of the Feature 4 wall. This wall base was Feature 12. It was made of mud prior to the placement of the Feature 4 adobe wall. Level 3 was very compact clay that was light brownish gray 10YR 6/2. A sample of carbon was found within the Feature 7 floor, and this sample was saved for AMS testing. This specimen of carbon was found within Floor Feature 7 (which was sealed underneath an additional floor Feature 2 above it), excavated with a small archaeological pick (as the context was too compacted for trowel excavation).

Level 4 was a layer of thick liquid silty clay (10YR 7/2 light gray), between the north wall (Feature 1) in the unit and the south wall in the unit (Feature 4), from the structure below it. This very compact layer of liquid clay was on natural ground and did not follow the slope of the hill. Level 4 contained pottery, shell, lithic material, and wood.
Feature 13 was another floor found directly connected to the upper part of Feature 12, the wall base, though it appeared the foundations of the Feature 12 wall broke the Feature 13 floor for construction of the Feature 12 wall.

Level 5 was a looser level of sandy loam (10YR 5/3 Brown) with gravel inclusions. This level produced no cultural material. Level 6 showed no change from Level 5 and was the termination of excavation of this unit.

Caldera, Sector C, Unit 5

Caldera Unit 5 was placed in Sector C of the site which was the lowest sector in the site’s topography. It measured 1m x 2m and was divided by a tapial wall (Feature 15) which ran through the unit from east to west. Because of wall Feature 15 which divided the excavation unit, the excavator divided the excavations into Unit 5a north of wall Feature 15 and Unit 5b, which was south of wall Feature 15.

Wall Feature 15 was composed of several segments of tapial, the joints of which were visible in the wall. A broken part was visible which showed how the pieces of tapial were connected; this was also visible in the profile drawings of units 5a and 5b. The excavations of sub-unit 5a and sub-unit 5b are discussed separately as they are different contexts. There is a discussion of 5a followed by a discussion of 5b.

It is worth noting that botanical analysis done for excavation units at Caldera showed that this unit, sub-unit, and extension contained the highest diversity of taxa. Pacae was represented in all samples analysed as was corn and cotton; Bellido Cerda interpreted these data as signifying that food crop cultivation (with the exception of cotton which could have been used for textiles) was of primary importance to the
inhabitants of the site through time. Bellido Cerda's full report is included in this
dissertation as an appendix.

Caldera, Sector C, Unit 5a

Figures 4.90-4.99

The surface of Unit 5a was a ~2cm thick layer of loose sandy loam matrix (2.5 Y
3.5 Light Olive Brown) that was likely deposited by looting activity nearby at the site.
Unit 5a Level 1 consisted of a matrix likely deposited by looters, but this material seemed
to have been deposited and exposed for some time before the deposition of the surface
layer. It was sandy loam of 2.5Y 5/3 Light Olive Brown which was loose in texture.

Feature 17 was a flat, rectangular plaster floor feature made by earth, clay, and
water with a very compact texture and 2.5Y 7/2 Light Gray in color. Floor Feature 17
adjoined wall Feature 15. Floor Feature 17 appeared to be composed of mud which was
later cleared and graded to create a flat surface. An additional floor fragment was found
in the western part of the unit and adjoining the west profile wall. This fragment was at
the same level below datum as Feature 17 but not connected to the main part of Feature
17 which followed the wall, but it was assumed to be another part of the same floor
which had undergone some destruction.

Feature 18 was a compact clay-loam floor-like feature which was composed of a
mixture of clay mud (10YR 6/2 Light Brownish Gray in color) and gravel. The
compactness of the feature was like a floor, but it was believed to be the preparation for
laying floor Feature 17 on top of it.

Feature 19 was a very compact floor with superficial irregularities and Munsell
5YR 5/8 Yellowish Red pigment. The texture of the floor itself was clay-loam with color
2.5Y 7/2 Light Gray. It was only visible in the profile as it was very thin, and even then it was only visible in small segments. This floor was underneath a small layer of gravel which is only possible to see in profile, and excavators were only able to find small pieces of it. In addition, this floor was below the wall Feature 15 and continued to the east and south.

Level 2 was a layer of semi-compact sandy loam with Munsell 10YR 7/3 Very Pale Brown. The deposit contained a mixture of matrix combined with gravel and was likely deposited by looting activities at the site. Level 2 was slightly more compact than Level 1.

Level 3 and Feature 21 consisted of compacted matrix. The level of compaction varied, and there was a line that ran north to south through the unit’s west side. The texture of Feature 21 was sand with gravel deposits with colors 2.5Y 6/3 Light Yellowish Brown on the east side and 2.5Y 6/2 Light Brownish Gray on the west.

Level 4 was sandy loam with gravel inclusions and was 2.5Y 6/3 Light Yellowish Brown. No material was collected in Level 4 except for within Feature 25. Feature 25 was part of Level 4 and was characterized by the presence of three small areas of semi-compact soil with a quantity of shell. Feature 25 was 2.5Y 6/3 light yellowish brown.

Level 5 was semi-compact sandy loam in Munsell 5Y 6/2 Olive Light Gray. There was an absence of cultural material, and thus it was determined that the unit had become sterile.

Caldera, Sector C, Unit 5b

Figures 4.100 – 4.120
This sub-unit measured 1m east to west by 0.85m north to south. The surface layer was a very thin (approximately 1.5cm) layer of loose sandy loam that was Munsell 2.5Y 6/3 Light Yellowish Brown in color. The matrix appeared to have been deposited by looters.

Unit 5b Level 1 contained much more cultural material than the previous layer (the surface) because it was a thicker layer, and it was also likely deposited by looters. Unit 5b was enlarged at this point, though, as the profile indicated that there were packed earth floors in the unit. One Cayash rim sherd was found in Level 1. This was the only clear example of Cayash style pottery found at the site of Caldera. Botanical fragments from Level 1 included avocado leaf, cane, and corn.

Feature 20 was a very compact floor made of silty clay loam of Munsell 10YR 8/2 Very Pale Brown color. Feature 20 was first visible in the unit wall and necessitated the 15cm extension of the unit.

Unit 5b Level 2 was loamy sand in 10YR 6/2 Light Brownish Gray. The matrix was loose on the north side of the unit and semi-compact in the southern part of the unit. Plant remains were collected from Unit 5b Level 2. A sample of plant remains was collected from excavation unit 5b and was ambiguously associated with Features 24, 26, and 27, all floors in level 2 of this unit and its extension. The sample was submitted for AMS dating. The sample was sent to the Center for Applied Isotopic Studies at the University of Georgia with sample ID CAIS 9873 for AMS dating. The result was 620 ± 20 B.P., which is the same as the sample tested from Sector A at Caldera. Other botanical fragments collected during the excavation of this level included remnants dominated by corn and cotton, but lucuma was also indicated.
Feature 22 was a fill to make a more level surface onto which floor Feature 20 was placed. Its texture was clay loam and color 10YR 6/2 Light Brownish Gray.

Feature 24 was a partial floor. It was made of very compact sandy clay in color Munsell 10YR 7/2 Light Gray. Floor Feature 24 showed its irregular shape in the plan view of the unit. Botanical analysis later confirmed that Feature 24 contained remnants of corn, peanut, pacay, cane, and gourd. A sample of seed was sent for AMS dating to the Center for Applied Isotopic Studies at the University of Georgia. AMS results from CAIS 9872 were 610 ± 20 B.P.

Feature 26 was a floor with yellow pigment that appeared to be associated with Feature 19 seen in unit 5a. Its texture was clay-like loam Munsell 2.5Y 7/3 Pale Yellow with the pigment a Munsell 5YR 5/8 Yellowish Red.

Feature 27 was another floor in three segments. This compact floor seemed to have been made from silty clay 10YR 6/2 Light Brownish Gray in color. Botanical fragments from Feature 27 included cane and pacay.

Level 3 was a layer of loose clay of 2.5Y 6/3 Light Yellowish Brown that still produced cultural material without specific context within the layer. Among the botanical remains, cotton, corn, and Pacay were represented. Feature 28 was a large granite rock in the middle of the unit, and a tube of an antara (flute) was to the east of rock Feature 28. The pottery from Feature 28 was quite interesting and appeared to be Huaura Style or similar. This is discussed in more detail later in this chapter.

Level 4 was a loose layer of sandy loam in 5Y 6/3 Light Brownish Brown and contained minimal cultural material. Feature 29 consisted of two small areas of semi-compacted loamy sand in color 5Y 6/3 Light Yellowish Brown. Feature 30 was a
grouping of pottery showing iconography possibly from the Middle Horizon. This pottery was found in the center of the unit in a very small area, one of the few small areas that were not looted. Unfortunately, this bag appears to have been lost.

Caldera, Sector B, Unit 6

Figures 4.77-4.87

The surface of Unit 6 was a very thin layer of loam that seemed to have been deposited naturally. The color was Munsell 2.5Y 6/2 Light Brownish Gray. Pottery was found on the surface.

Feature 23 was a wall located in the southern profile of the unit. Wall Feature 23 was composed of adobe bricks that had been covered with yellow paint. The brick color was Munsell 2.5Y 7/2 Light Gray. Near the bottom of wall Feature 23, a looters’ pit was visible.

Level 1 was a ~25cm thick layer that consisted of more back-dirt from looters with additional disturbed areas present in the unit. The matrix was Light Yellowish Brown (2.5Y 6/3), and the loamy sand was loose in texture. The level contained pottery, bone, shell, lithics, botanicals, seeds, cotton, and textile fragments. Looting was indicated by the hole in wall Feature 23. There was a large circular cut stone in the northern profile, and there was a similar cut stone on the west side of the unit. The mode of deposition of this level was not discernible, but the matrix was almost certainly disturbed.

Like the layer above it, Level 2 was characterized by disturbed contexts which were likely caused by looters. The matrix was loamy sand in Light Yellowish Brown (2.5Y 6/3) and was about 60cm thick. The reason it was divided from the previous level is because it was slightly more compact than Level 1. Once a thin, albeit more compact
layer was removed, additional looser material was encountered. The more compact division may have been caused by two incidents of looting at different times. Pottery, bone, shell, lithic, cotton, textile fragment, a pigment sample, and coprolites were found in Level 2. Near the north and west profiles of the unit, two large rocks were present (as they were in Level 1), and the deposition was indeterminate but likely caused by looters.

**Additional Notes on Analyses of Materials Collected from Caldera**

Carol Rojas Vega analyzed the shell collected from a variety of contexts at Caldera. Her raw data and report are included as appendices in this dissertation.

Enrique Bellido Cerda analyzed the bulk of the macrobotanical remains from the site of Caldera. Bellido Cerda’s report notes that most of the botanical remains from Caldera are from edible plants, and fruits are well represented. There was also evidence of wood, which could be used in building construction. Charred macrobotanical remains suggest that one of the uses of wood was for fuel. His data and report are included as appendices to this dissertation.

Luis R. Huamán Mesía analyzed pollen from floor samples in Unit 5a, Level 1, Feature 19, as well as from Unit 4, Level 2, Feature 2. The results of this analysis are included in this dissertation as an appendix.

**El Carmen, Sector A, Unit 1**

Figures 4.128-4.139

Excavators initially thought the thinner adobe *tapial* architecture present at El Carmen probably dated to the Middle Horizon. Sector A, which was located on the western side of the *quebrada* and abutting the western hillside, contained the most dense concentration of this thinner variety of *tapial* at the site. Sector A, Unit 1 was a 1m x 1m
unit located in the doorway of a single-room structure made of adobe *tapial* whose east and west walls were convex. This was notable as no other structures at Caldera (or El Carmen) exhibit curvature in the walls.

Unit 1 at Caldera was placed in the building’s doorway which was located in the middle of the building’s east wall facing the *quebrada*. The doorway was embellished, to use Nelson et al.’s term (Nelson et al. 2010). The unit was oriented slightly off the cardinal directions at 20 degrees west of north (at 340 degrees). Datum 1 was placed in Feature 32 (adobe *tapial* wall protruding into the southern portion of the unit) at 15cm from the top of the wall.

The superficial level (prior to excavation) showed structure walls, Features 32 and 33, at a height of 21cm and 30cm, respectively, above the ground surface. A small amount of lithics and ceramics were collected from the surface. The texture was sandy clay loam, and it was loose, not compacted. It was Munsell 10YR/6/4 Light Yellowish Brown.

Feature 32 was a wall of adobe *tapial* protruding into the southern wall of the unit and part of the embellished entryway of the structure. Wall Feature 32 was the better preserved part of the doorway in which Sector A, Unit 1 was placed. The depth of the top of Feature 32 was 15cm below Datum 1.

Feature 33 was a wall of adobe *tapial* protruding into the northern wall of Sector A, Unit 1 (the other side of the doorway over which this excavation unit was purposefully laid). Its top was at an elevation of 6cm below datum (taller than the height of Feature 32).
Level 1 was approximately 19cm thick. A floor, Feature 31, was encountered on the east side of the unit, but it did not extend throughout the unit. Feature 34, an aggregation of cotton and string which may have been an offering, was found at the edge of Feature 31 and between structure walls Feature 32 and 33 (that is, in the doorway) during the excavation of Level 1. A sample of paint (collected 57cm from the east wall of the unit, 37cm from the south wall of the unit and at a depth of 43cm below datum), and a sample of the matrix was collected from Level 1. A sample of the floor that was Feature 31 was also collected. In addition, string, lithics, ceramics, cotton, coprolites, plants, shell, human and camellid bone were present and collected.

The uppermost floor (Feature 31) was sandy clay loam, very compact in texture. It was Munsell 10YR 5/3 Yellowish Brown. The west side of the trench was more gritty in texture than the floor Feature 31, which only extended through approximately ½ of the unit. The west, non-feature portion of the unit was also Munsell 10YR 5/3 Yellowish Brown in color.

Feature 31 was a floor which was intact through the east side of the unit at a depth of about 55cm below datum. On its east edge was Feature 34. A 10cm x10cm section of the floor Feature 31 was collected as a sample. Feature 31 was sandy clay loam that was compact in texture. It was Munsell 10YR 5/3 Yellowish Brown. The floor did not cover the entire unit, only the east side. The rest of Level 2 was the same color as the floor Feature 31 but grittier in texture (sandy loam) and less compacted. From Feature 31, Level 3, ceramics, lithics, and plant remains were collected in addition to a carbon sample. The sample of charcoal was sent to the Center for Applied Isotopic Studies at the
University of Georgia for AMS dating. CAIS 9877 dates to 660 ± 20 B.P. A ~10cm x 10cm sample of Feature 31 was left in the southeast corner of the unit.

Level 2 was about 9cm thick. Features 31 and 34 were removed during the excavation of Level 1. From Level 2 apart from Feature 34, cotton, plant remains, lithics, ceramics, and string were collected from the possible offering of Feature 34 which was excavated as part of Level 2.

A largely intact floor, Feature 35, was discovered at the bottom of Levels 2 and 3. A sample of Feature 35 floor was collected.

Level 2 existed only on the west side of the unit. (Level 3 was only on the east side of the unit.) Levels 2 and 3 were of similar depths below datum; they were excavated separately due to the break in the above-lying floor Feature 31. The drawing of Level 2 (east side of the unit) also shows Level 3 (west side of the unit) and Feature 35 (floor).

Feature 34 was a concentration of cotton and string beside/adjoining the floor remnant Feature 31. Cotton, string, plant remains, and lithics were collected from Feature 3, Level 2. The cotton was a collection of brown, white, and some reddish pieces. The string was of two types, one of which was red. Among the botanicals collected during the excavation of Feature 23 were corn and cotton.

Feature 35 was a floor fragment initially found on the western side of the unit located at the bottom of Level 2. After the excavation of both Levels 2 and 3 to the level of this floor Feature 35, it was proven to be quite intact, with only a hole in the northwest corner of the unit. Feature 35 was even more compact than the floor above it (Feature 31) which was located only in the east ½ of the unit. There was a seam or crack in the
floor that was about 1cm wide and ran roughly N-S in the unit, connecting the north and south faces of the doorway (Feature 33 and Feature 32, respectively).

Carbon, coprolites, lithics, ceramics, bone, plant remains, and shell were collected from Feature 35, Level 4. The coprolites found between Features 31 and 35 may have been from sheep, but analysis has not been done. A sample of the floor Feature 35 was collected. The coprolites were not thought to be modern disturbances since they were found sealed between reflooring episodes. A sample of carbon from Feature 35, Level 4 was collected from 20cm from the east wall of the unit, 44cm from the north wall of the unit, and 67cm below Datum 1. This sample was not sent to the lab for testing.

Level 3 was 9cm thick and on the east side of the unit. Level 3 consisted of the removal of floor Feature 31 which was only present on the east side of the unit. The goal of the excavation of Level 3 was to take down the east side of the unit to expose Feature 35 (a floor) to determine its extent. Feature 35 was mostly intact but did have a hole in the northwest corner. Coprolites and shells were collected in Level 3. From Level 3, Feature 31, a sample of carbon, a sample of matrix, lithics, ceramics, and plant remains were collected. The coprolites that were found in Level 3 between Feature 31 and Feature 35 resembled sheep coprolites but were not analyzed to confirm or negate this hypothesis. In his report on the botanical samples from El Carmen, macrobotanical specialist Bellido Cerda reported that of El Carmen, this sector, unit, and level in particular contained the largest sample of botanical remains he analyzed from the site. His report is included as an appendix to this dissertation. Level 3 was sandy clay loam in texture. It was Munsell 2.5Y 5/2 Grayish Brown in color.
Level 4 was only about 3cm thick and consisted of the removal of floor Feature 35 and exposing floor Feature 39 immediately below it. From Level 4, Feature 35, coprolites, lithic artifacts, ceramics, bone, plant remains, and shell were collected. Samples of the matrix were also collected, as were a sample of floor and carbon from Level 4. The hole or area of looser material found in the northwest corner of the unit in Level 2, Feature 35 persisted through Level 4 (Level 3 is on the east side of the unit). The texture of Level 4 was sandy clay loam. Its color was Munsell 2.5YR 5/3 Light Olive Brown.

Feature 39 was another floor immediately below Feature 35 floor. Feature 35 had been placed, with little/no fill, right above floor Feature 39. Like Feature 35 above it, Feature 39 had cracks about 1cm wide. These cracks were undulating and in no discernible pattern between the two faces of the embellished doorway made up of Features 32 and 33. Feature 39 had more cracks than floor Feature 35 which succeeded it. Also, the disturbed area continued through the depth of Feature 39 as indicated by the looser material (break in the floor) in the northwest corner of the unit. A small (~10cm x 10cm) sample of Feature 39 was kept adjoining the sample of Feature 35. In some places excavators were able to pry up portions of Feature 35 with trowels in order to expose Feature 39.

Three samples of carbon were collected during the removal of Feature 39. The first was collected 26cm from the east wall of the unit, 38cm from the south wall of the unit, and 70cm below Datum 1 (20 cm above the top of structure wall Feature 32). The second sample of carbon was found just beside and below what looked like the base of Feature 32 (structure wall, southern side of doorway in which the unit was placed). It was
collected 19 cm from the south wall of the unit, 37 cm from the east wall of the unit, and 73 cm below Datum 1. The third sample of carbon was collected 40 cm from the south wall of the unit, 44 cm from the east wall of the unit, and 74 cm below Datum 1. This sample was later sent to the Center for Applied Isotopic Studies for AMS dating with lab ID CAIS 9878. Since samples from floor Feature 39 were found (1) within a floor and (2) under two other floors, it was a secure context for AMS dating. The sample dates to 660 ± 20 B.P.

Level 5 was about 7 cm thick. The excavation of Level 5 involved the removal of Feature 39 and the exposure of a partial floor, Feature 46, in the western side of the unit, but there was no evidence of floor on the east side of the unit. Lithic and ceramic artifacts, bone, shell, plant remains, and textiles were collected during the excavation of Level 5/Feature 39. Also, samples of the floor, the matrix, and two samples of carbon were collected from Level 5/Feature 39. Further, the “hole” or area of looser material found in the northwest corner of the unit during Levels 2 and 4 was also present in Level 5. This certainly suggests there was a disturbance in this area of the unit after the construction of all of the floor constructions. The east (non-feature) portion of the unit consisted of looser matrix and rocks of various sizes. This texture of the east side of the unit was grittier than the material which was used in floor Feature 46. The texture was sandy loam, and the color was Light Yellowish Brown (2.5Y 6/3).

Feature 46 was the fourth and earliest floor encountered during the excavation of Sector A, Unit 1 at El Carmen. It was present only on the western side of the unit. The disturbance in the northwest corner of the unit adjoining structure wall Feature 33 was still present at the depth of Feature 46. A sample of Feature 46 was collected from a
10cm x10cm area of the floor. Feature 46 was very compact in texture because it was a floor. It was sandy clay loam (more smooth than the matrix above it). It was Munsell 2.5Y 5/3 Light Olive Brown in color.

Level 6 was a 32cm thick layer of construction fill underlying the wall Features 32 and 33 and floor Feature 46. Artifact density greatly decreased in this level. A sample from floor Feature 46 was collected, but a sample from the east side of the unit where the floor was broken was also collected. A sample of carbon was collected from 25cm from the west wall of the unit, 28cm from the south wall of the unit, and 90cm below the level of Datum 1. This carbon sample, which was found beneath the floor Feature 46, was placed in 1525, but this sample was not sent for AMS dating. Lithic artifacts, ceramics, shell, and botanical remains were also collected. The texture of Level 6 was sandy loam, and the color of the matrix was Munsell 2.5Y 6/3 Light Yellowish Brown.

Excavators chose to stop excavating in Sector A, Unit 1 because (1) the area was getting too deep to work in and (2) the artifact density and matrix suggested the excavation had reached construction fill below the wall bases and floors that were part of the structure.

El Carmen, Sector A, Unit 2

Figures 4.140-4.153

Because of the degree of looting and natural disturbances at El Carmen which included flooding episodes, another suitable location for excavation within an adobe structure was not readily apparent. Excavators were especially cautious about this after having previously selected excavation areas at Caldera that proved to be heavily looted
despite superficial appearances to the contrary (e.g. Units 1, 2, and 3 in Sector A and Unit 6 in Sector B, or 2/3 of the excavations at the site). However, since the site of El Carmen contained at least four different types of architecture which were associated with distinct forms and construction materials, exploring the temporal relationships of the different architectural types at the site became an additional focus of this research. El Carmen’s Unit 2 was placed in a corner of a fieldstone structure in Sector A in order to explore the relationship between the adobe tapial single-room structures (e.g. Sector A, Unit 1 described above) and the large, fieldstone compounds also present at the site.

Unit 2 was placed in Sector A on the interior of a fieldstone room. The surface of Unit 2 was covered with large and medium stones which appeared to have collapsed from the structure around it. This collapse was posited to have been caused naturally by landslide or flooding.

Level 1 was silty loam of Munsell 10YR 4/2 Dark Grayish Brown and contained a large quantity of medium stones and a fewer number of large stones. The stones were mixed with matrix which seemed to have been deposited by wind. Among the botanical remains collected during the excavation of Level 1, avocado, peanut, lucuma, and corn were represented.

Feature 36 was a concentration of pottery sherds which appeared to be part of a food storage vessel, possibly a jar, and a shell of a marine mollusk. Excavation of Feature 36 produced shells and six pottery sherds.

Feature 37 was a concentration of stones aligned in a square, and the stone-lined area contained earth mixed with ash and scorched earth. The characteristics of Feature 37
led researchers to conclude that it was a hearth feature. The color was Munsell 10YR 3/2 Very Dark Grayish Brown while the silty loam was only loosely compacted.

Level 2 appeared to have been an alluvial deposit, possibly from flooding which is known to occur at the site based on conversations with the farmer whose family lives just beyond the limits of the southern boundary of the site. The sandy matrix supported the notion of alluvial deposition. The texture of the matrix was loose sandy loam, (10YR 7/2) Light Gray. Among the botanical remains encountered during the excavation of Level 2 were peanut, pacay, cane, corn, and bean. From his analysis of an array of samples from various contexts at Caldera and El Carmen, Bellido Cerda reported that Level 2 of this unit contained the greatest diversity of taxa, though Level 3 of Unit 1 contained a higher quantity of botanical remains. The excavation of this level produced some 150 pot sherds.

Feature 40 was made up of a cluster of stones with matrix mixed with ash and was possibly part of the hearth Feature 37. Feature 40 was connected to Feature 37. The color was 10YR 4/2 Dark Grayish Brown. A sample of seeds was taken from this continuation of the hearth Feature 40. This sample was sent to the Center for Applied Isotopic Studies at the University of Georgia and was given the lab ID CAIS 9874. At 710 ± 25 B.P. This sample was one of the oldest contexts sampled at either site. Botanical remains included cotton, and an insect was also found.

Level 3 contained a quantity of large stones and packed earth on the west side of the unit and more gravel on the east side of the unit. The east side of the unit was gravel of 2.5Y 6/2 Light Brownish Gray, while the west side of the unit was 2.5Y 5/3 Light Olive Brown.
Feature 48 was a patch of ash with some remains of worm eggs and seeds. The excavators also found coal remains. The Munsell color of Feature 48 was 10YR 5/3 Brown. A sample of carbon was taken from this level. This sample was sent to the Center for Applied Isotopic Studies in Georgia for AMS dating and received lab ID CAIS 9875. The result was a date of 730 ± 20 B.P.

Level 4 was characterized by moderately compact silty clay that was 10YR 6/3 Pale Brown and a quantity of both large and medium-sized stones. The excavators reached sterile matrix and terminated the excavation.

El Carmen, Sector B, Unit 3

Figures 4.164-4.175

The third unit was placed in a large fieldstone compound in Sector B which was topographically higher in the site and differed from the architecture in which Unit 2 was placed. This was a sprawling fieldstone compound much larger than the structure where Unit 2 was located.

The superficial layer was completely covered by large stones which had likely collapsed from the fieldstone walls to the north and west. Level 1 was composed of matrix deposited by wind which also carried ash from the burning of sugar cane fields below the site. The sandy loam was 2.5Y 5/3 Light Olive Brown and not compacted. Level 1 produced six sherds, shell, botanicals (gourd seeds, lucuma, peanut, cactus, and pacay) and textile fragments. Interestingly, this unit contained a noticeably smaller amount of botanical remains than the other two units excavated at El Carmen. In his report on the macrobotanical remains from El Carman, Bellido Cerda stated “we note that this [the amount of macrobotanical remains] is almost zero in Sector B. In this sector the
evidence comes mainly from Level 1 of Unit 3, and even though the evidence may suggest some consumer activity or food handling, it would be wise to watch the rest of the archaeological features since this is a superficial layer even though it does not seem to have been exposed to disturbances or indicate a time of abandonment” (Bellido Cerda 2010, translation by Heaton; full report included in this dissertation as an appendix).

The matrix of Level 2 varied between compact and semi-compact silty clay that was 10YR 6/3 Pale Brown. The matrix contained gravel inclusions as well as sand and silt and both medium and large stones. The area in the center of the unit was semi-compact, while the rest of the level was more compact. Excavation of Level 2 produced 25 pottery sherds, shell, lithic, and wood. This sample of wood was later sent to the Center for Applied Isotopic Studies at the University of Georgia for AMS dating where it received the lab ID CAIS 9876. This sample was chosen for AMS dating because it was the only item from the excavation of Unit 3 that was a dateable material. CAIS 9876 resulted in an AMS date of 200 ± 20 B.P. which suggested (1) problematic material (wood), (2) contamination of the sample, or (3) a later reoccupation of the site.

Level 3 was sandy clay 10YR 5/3 Brown with a greater quantity of stones than the level above it. The southeast corner of the unit contained compact loam in 10YR 7/4 Very Pale Brown.

Profile Cleaning from a Looters’ Pit, Sector A

Figures 4.154-4.161

In order to glean some data from destruction already caused by looters, excavators cleaned a looters’ pit in Sector A along one of the very few examples of architecture at El Carmen that was characterized by alternating layers of adobe tapial and large, uncut
stones to form an east-west running wall. The goal of cleaning this looted area was to learn more about this construction which was not common at El Carmen and was not present at Caldera.

Excavators began by removing loose earth in order to provide a better view of the current state of the wall. It was noted that the wall had been damaged on the west side of the pit. In order to maintain safety and to avoid further destruction of the wall, this area was not further cleaned or expanded. Thus, the eastern portion of the pit was selected as a better, safer place to expose a profile.

The eastern edge of the adobe-and-stone wall was adjacent to another wall with a north-south orientation. The base of the wall was found. A large amount of cultural material was collected during the cleaning of this looted area. The assemblage included both whole vessels and sherds, bone, textile fragments, cotton, wood, thread, and others. Six features were encountered during the work on this looted area in Sector A, and these are described below.

Feature 41 was the wall itself which was being cleaned. Through this process the team was able to observe this construction technique which was not common at the site. This technique utilized large chunks of tapial in rows alternating with rows of uncut stone. This wall was then covered with mud plaster to create the impression of an impressive and sturdy wall. Feature 41 was 520cm east-west of exposed wall, 43cm in width, and a maximum height of 171cm.

Feature 42 was the wall that was oriented north-south and intersected with Feature 41 to form a corner on the east side of the looted trench. Feature 42 was in better condition than wall Feature 31, but the construction technique was the same with long
rows of stones alternating with rows of large tapial pieces that were something like huge bricks. These sections of adobe and stone were layered one on top of another and then covered with a façade of adobe. The exposed portion of wall Feature 42 was 570cm long, 44cm wide, and 152cm at its maximum height.

Feature 43 was a floor located in the northeast corner of the profile and abutting Feature 42 (and may have been built before wall Feature 41 was constructed as it appeared to be underneath wall Feature 41). The texture of Feature 43 was very compact silty clay loam of Light Yellowish Brown (color Munsell 2.5Y 6/3). This floor was made of compacted material, possibly adobe, but it presented evidence of disturbances in the form of cuts via looting. This floor feature measured 58cm in length, 39cm in width, and 10cm depth.

Feature 44 was another floor located in the northeast corner of the profile and was found immediately below Feature 42. The compact surface (which might have been made of adobe) was silty clay loam that was Munsell 2.5Y 6/3 Light Yellowish Brown color in color. The section of floor Feature 44 measured 103cm in length, 70cm in width, and 5cm in depth and contained botanical remains within its structure.

Feature 45 was the third floor found in the northeast corner of the looters’ trench as it was being cleaned. This floor was encountered immediately below floor Feature 43. The matrix of Feature 45 was silty clay and was Munsell 2.5Y 6/3 Light Yellowish Brown in color, and looting was again evident. Floor Feature 45 measured 104cm in length, 69cm in width, and 4cm in depth, and its excavation produced pottery, shell, and botanical remains.
Feature 47 was the fourth and final floor encountered in the northeast corner of this trench and was found just below floor Feature 47. It was constructed of compacted mud with a silty clay texture and Munsell 2.5Y 6/3 Light Yellowish Brown in color. As did the previous floors as well as the wall features, this floor feature presented evidence of looting. It measures 104cm in length, 69cm in width, and 4cm in depth.

**Additional Notes on Analyses of El Carmen Materials**

As was noted previously in the description of the work at El Carmen, Enrique Bellido Cerda analyzed a sample of macrobotanical remains collected during excavations at the site. Bellido Cerda found that the bulk of the sample consisted of cultivated species, and all samples were from habitats that are present in the valley at different elevations in coastal and lower middle valley. Many of the plants represented in the assemblage were edible, though some edible plants could also have been used for fuel for fire. Utilitarian plants like cotton (for textiles) and containers (gourds) were represented by one sample of each. Bellido Cerda encountered no examples of upland cultivars in his analysis of macrobotanical remains from El Carmen. His full report is included as an appendix to this dissertation.

Carol Rojas Vega, a specialist who studies shell remains from archaeological contexts, analyzed a sample of shell from the site of El Carmen. Her original report is included in this dissertation as an appendix. Luis R. Huamán Mesía analyzed pollen samples taken from the following contexts at El Carmen: Unit 1, Level 6, Feature 46; Unit 3, Level 4, Feature 49; and Unit 1, Level 1, Feature 31. Results from his analysis are included as an appendix to this dissertation.
“Without a sound chronology, any inference about subsistence, settlement, or social systems in the past are likely to be historical monstrosities” DeBoer (1996:26)

“[Huaura Style] pottery is known for its distinctive characteristics, limited geographic range or dispersal, and associations with other styles and regions during the Middle Horizon dispersal and associations with other styles of different regions and eras of the Middle Horizon” (Cruzado Carranza 2008)

Adobe architecture featuring embellished doorways and pottery assemblages including Black, Red, and White as well as press-mold pottery are thought to date to the Middle Horizon (e.g., Nelson et al. 2010), and they can be found in many sites in the Huaura Valley. In light of the fact that the excavations at Caldera and El Carmen yielded AMS dates that cluster in the Late Intermediate Period (with the exception of one later outlier which is discussed in this dissertation), it is clear that their original presumed chronological placement for sites with these characteristics may need to be revised. This of course necessitates a reassessment of the suite of pottery and associated architecture which had previously been thought to be “canonical” of the Middle Horizon in the Huaura Valley (Nelson et al. 2010:176-77). Pottery attributable to the Huaura style from Caldera and El Carmen demonstrate that this type of pottery in the Huaura Valley dates to the Late Intermediate Period rather than the Middle Horizon.
Previous Studies and the Problem of Huaura Style

While noting a general lack of archaeological research in the area at the time, Strong and Willey stated that the surface remains in the Norte Chico suggest shared regional styles as well as the presence of Chancay Black-on-White (Brown 2008a:55; Strong and Willey 1943:10). Willey stated that White-on-Red pottery were an indicator of the Middle Horizon on the central coast as well as in the region of the Norte Chico, linked elsewhere to the end of the Early Horizon and the very beginning of the Middle Horizon (Willey 1945:51). Later, Horkheimer also noted the presence of Chancay ceramics at the Huaura Valley sites of Rontoy and Acaray (Horkheimer 1965).

Louis Stumer conducted a study of the site of Caldera with attention to the site’s surface ceramics in order to fill gaps in knowledge about the prehistory of the Central Coast (Stumer 1952:38). Stumer’s surface collections from the site led him to posit that the site was occupied during the Early Intermediate Period and Middle Horizon through the early portion of the Late Intermediate Period (Stumer 1952:61). Stumer’s conclusions were based on surface collections at the site and stylistic comparisons to other collections.

Soon after Stumer’s publication, Mejía published one of the earliest references to what he called “Huaura culture” which he placed in the “Tercera Edad,” approximately 500 – 1300 A.D., including the four valleys of the Norte Chico as well as the Chancay and Chillón valleys (Cruzado Carranza 2008:4; Mejia 1953). Mejía divided the pottery from this zone into two sub-styles: Pativilca stamped or impressed and Huaura style with polychrome painted decoration or “Tiahuanacoid Huari style.” Mejía posited that the Huaura culture flourished through what we know as the Middle Horizon and that it
declined in the “Fourth Age,” roughly 1300-1500 A.D. (Mejía 1953). Mejía focused on the material culture of the Huaura period as a whole rather than with a strict focus on the pottery (Cruzado Carranza 2008:5-6). Vallejo has subsequently suggested that Mejía’s study of the material culture inadequately defined the pottery’s characteristics because the main goal of the research was to define a “Huaura nation” (2010:232).

In 1972 Luis Usera Mata published a study of pottery from the surface collections of looted cemetery contexts in the Huaura Valley in which he tried to establish cultural timelines. With attention to form and decoration, Usera described Chancay Black on White, Chancay yellow, Huaura White on Red, Huaura White and Black on Red, Huaura Tricolor (Usera Mata’s drawings [Usera Mata 1972:208] which look much like some of the pottery from Caldera and El Carmen), Huaura Red and White on Orange, Huaura Polychrome, Ordinary (which appears to signify undecorated utilitarian vessels), and Huaura Red and Black on White (Figure 5.1). Usera Mata noted ties between this assemblage, Wari and, more directly, the “radiation” (translation by Heaton) of Pachacamac at its peak in Middle Horizon 2b (Usera Mata 1972:227). In a more recent study which includes a survey of previous literature on the subject, Francisco Vallejo of the Universidad Nacional Federico Villarreal in Peru notes that it was Usera Mata “who initially tried to set the iconographic components and technical features of this style through the typological method, used to do ‘guide features’ as decoration, motifs and colors represented” (Vallejo 2010: 233, translation by Heaton).

Noting a persistent lack of detailed studies and secure definitions of Huaura style, Elizabeth Cruzado Carranza, then a student at Universidad Nacional Mayor De San Marcos, did a study of 52 Huaura style vessels from museum collections (Cruzado
Carranza 2008:11). Some of the pieces were looted and thus do not have much in the way of provenience information (Cruzado Carranza 2008:7). Based on the literature that existed at the time, Cruzado Carranza believed Huaura style to be associated with the Middle Horizon, and she viewed the samples in this context. In fact, the stated objective of the research is as follows: “This type of pottery is known for its unmistakable characteristics, limited geographic range, and associations with other styles from different regions and phases of the Middle Horizon that make it particularly key not only to develop a proper sequence for the North Central Coast, but also to offer a glimpse of a panorama of the Middle Horizon Huaura from the perspective of Huaura style” (Cruzado Carranza 2008:1-2, translation by Heaton).

Close to the time of Cruzado Carranza’s 2008 study of Huaura Style pottery, Margaret Brown Vega was finishing her dissertation on the Early Horizon and Late Intermediate Period occupations at the Huaura Valley fortress of Acaray. In the body of her dissertation, Brown Vega (2008a) provides a survey of the literature on the pottery of the Norte Chico with particular attention to Late Intermediate Period pottery, and the excavated and surface collected ceramics from Acaray are discussed in the appendices. For example, Brown states,

While it is argued that the style known as Lauri Impreso, found in the Chancay Valley, is contemporary with Chancay black-on-white and the same as the Cayash style identified for the upper Huaura Valley, the chronological relationship between these styles is unclear (Cornejo Guerrero 1992). Pazdur and Krzanowski (1991:131) suggest that the Chancay black-on-white style and Lauri Impreso are developed in parallel during the Late Intermediate Period. It is also difficult to attribute these stylistic differences to separate groups of people, even though that is done by researchers working in the region. The assumption is that different people are making these “different pots” (Brown Vega 2008a:56).
Brown’s clarification that Lauri Impreso and Cayash style are two names for the same style is relevant when one considers the relationship between the inhabitants of the lower Huaura Valley and upper Huaura Valley. (It should be noted that Vallejo has subsequently stated that Lauri Impressed and Cayash are similar [Vallejo 2010:235], but he does not indicate that they are the same). Based on observations of the assemblage from Quipico further up-valley (Dunn personal communication 2010) compared with materials from Caldera and El Carmen which are further west, Cayash (or Lauri Impressed) style is fairly common up-valley but a rare phenomenon closer to the coast.

Kit Nelson, who participated in and led various archaeological projects in the Norte Chico between 2001 and 2010 (Nelson and Bellido 2010; Nelson and Ruiz Estrada 2007; Nelson and Ruiz Estrada 2010; Nelson and Ruiz Rubio 2005; Nelson et al. 2010; Nelson personal communication 2011), also saw connections between the stylistic features of Middle Horizon pottery from the Wari polity and the material culture of certain occupations in the Norte Chico, primarily in the Huaura Valley (see also Usera 1972:227 with more attention to styles from Pachacamac).

Subsequent studies of the occupations with Huaura style pottery and associated architecture date to the Late Intermediate Period—at least in the limited excavations at the sample Huaura Valley sites of Caldera and El Carmen—which renders the foundation of much of the research comparing these “Middle Horizon” occupations to contemporary societies somewhat less applicable. However, useful information can still be gleaned from an exploration of this literature. One example of this is the opportunity such a review affords to understand some of the reasoning researchers have relied upon to draw connections between pottery and architecture in the Huaura Valley and between these and
sites elsewhere with secure Middle Horizon dates. For instance, press-mold wares (with probable ties to the Casma polity to the north), polychromes with purportedly Middle Horizon features, and utilitarian wares are visible at sites in both the Huaura and Pativilca Valleys (Nelson et al. 2010:180-81), a co-occurrence which may have implications for the similar timing of these styles. The press-mold wares, often mis-named “impressed,” have names that are most commonly based on where they are found because there is scant inter-valley investigation delineating common features and differences in pottery (Nelson et al. 2010:180-81). Therefore, when a new “impressed” style is found, it is usually given a new name. Some local names include Pativilca Impressed, Huaura Impressed (Nelson et al. 2010:180-81) and Lauri Impressed (Jahnke 2009:26) which has also been called Cayash (Brown 2008a:56). In these press-mold wares, framing lines are used in the imagery to demarcate decorated sections of the pottery. Frequently occurring in the decorated areas are raised line and “bean shaped” patterns (Nelson et al. 2010:180-81). Additional features include stylized birds and sea animals. Nelson points out that the Huaura Valley ceramics exhibit more uniformity than do those from the Pativilca Valley. Referring to Melissa Vogel’s work in the Chao Valley (2003), Bria (2006) has also discussed the distribution of press-mold pottery throughout the Norte Chico and the larger area of the Central Coast. The method of production of press-mold pottery as well as shared design features link the Norte Chico into a “north central coast iconographic system” (Nelson et al. 2010:180-81).

Nelson et al. (2010) assert that Middle Horizon polychromes generally share variations of the yellow, red, cream, and black color scheme on top of a red background. Extrapolating that Huaura Valley polychromes incorporate some permutation of this
color combination—sometimes decorated with fairly simple designs such as parallel lines or a line with dots—they suggest that these date to the Middle Horizon, though they note that the purportedly Middle Horizon pottery of the Huaura Valley tends to lack depictions of mythical figures more common on Wari and Middle Horizon pottery elsewhere. Nelson et al. (2010) also point out other differences between purportedly Middle Horizon pottery from the Huaura Valley to Middle Horizon pottery found elsewhere:

The blocky figures and design elements within larger motifs are also rare in the Norte Chico. Overall the pure quantities of elements and motifs are few, and motifs are simple, typically composed of only a few geometric elements. These motifs are then replicated across the zone of decoration. This design layout mimics that found on the local pressmold ware that is the dominant pottery style during the MH in the Norte Chico (Nelson et al. 2010:181)

It is clear that the pottery found in the Huaura Valley possesses characteristics which might lead an investigator to connect it to the Middle Horizon, but based on AMS dating from limited excavations at the sites of El Carmen and Caldera, it appears that the differences which Nelson et al. (2010:181) described are due to a few hundred years’ difference in time.

Francisco Vallejo evaluated the studies of and literature on Huaura style pottery (Figures 5.2 through 5.5) to date, though he was aware of the problems inherent in studying a pottery style that is not sufficiently defined or associated with radiometric dates. He notes,

*Archaeological sites with Middle Horizon material that may be called Huaura are quite heterogeneous in material composition style …*[T]he current ability to objectively establish the characteristics of what is called Huaura style is unfortunately limited by the absence of specific contexts that allow an actual segregation of the components of this style. Moreover, there is little archaeological work to indicate what types can be objectively referred to as*
Huaura style ([Brown and Rivas 2004; Cross 2008; Ravines 1993; Usera 1972]. Vallejo 2010:232-33, translation and emphasis by Heaton)

Vallejo sees Huaura style as a Middle Horizon phenomenon and an assertion of the makers’ independence from the Wari polity. He also suggests that Huacho style, which he also discusses in the publication, is a derivative of Huaura style and succeeds it (Vallejo 2010:233-34).

While many sherds analysed in this dissertation come from surface collections and are not directly associated with dated contexts, the fact that the AMS dates repeatedly and securely place El Carmen and Caldera well into the Late Intermediate Period cannot be ignored. The pottery found in El Carmen, Sector A, Unit 2, is the most distinct example of pottery from a secure excavated context that previously thought to be a Middle Horizon style in a context with associated AMS dates placing them in the Late Intermediate Period.

**Definitions and Descriptions of Huaura Style**

Even though it is based on a study of vessels in private collections (without detailed provenience information) and museums, Elizabeth Cruzado Carranza’s 2008 project is the most robust effort in defining and describing Huaura Style to date. When describing the problem, she stated, “Despite the importance of Huaura Style, there have been no studies focused on determining the main features of this style, or research conducted to cover its definition. Many authors have given limited mention to the style as belonging to this area, but they have not studied it to determine other important aspects of the style including manufacture, decoration, function, types and variations, which social group(s) the style was associated with, duration of the style, and geographical scope,
among others” (Cruzado Carranza 2008:2, translation by Heaton). Vallejo’s statements on Huaura Style mirror Cruzado Carranza’s: “…the current ability to objectively establish the characteristics of Huaura Style is unfortunately limited by the absence of specific contexts that allow an actual segregation of the components of this style. Moreover, there is little archaeological work with some accuracy to indicate what types can be referred to objectively as part of the style called Huaura (Brown and Rivas 2004; Cross 2008; Ravines 1993; Usera 1972)” (Vallejo 2010:232, translation by Heaton). In short, though scholars of the prehistory of the Norte Chico often mention Huaura Style, there is no standard and agreed-upon definition for the style, systematic study of its geographic range, or secure dating.

In her 2008 study, Cruzado Carranza noted nine types (which is mirrored from Usera Mata 1972) and described them based on the vessels in her study sample that were attributed to Huaura Style. She lists the types associated with Huaura Style as follows: (1) vase or kero with inverted sides and flat base (with various designs possible including anthropomorphic and zoomorphic elements), (2) “ictomorfa” vessel, (3) globular pot with black neck and designs around the vessel, (4) globular pot with designs on each side, (5) female anthropomorphic figure, (6) globular pot with designs all around the outside, (7) jar, (8) dish with geometric designs, (9) vase or kero with designs on the edge (Cruzado Carranza 2008:12). (See Figure 5.6.) Regarding the iconography, Vallejo states that style makes use of iconography of the previous Wari period but is most stylistically similar to Middle Horizon 3 and 4 (Vallejo 2010:232). Cruzado Carranza’s detailed descriptions can be found in her 2008 publication.
As no other investigator’s description approaches the level of detail given in
Cruzado Carranza’s systematization of types that make up Huaura Style, her detailed
descriptions will be translated and summarized here.

Huaura Style Type 1 vessels are vases or keros with inverted sides and a flat base.
Type 1 vessels are burnished with bichrome or polychrome designs on the exterior of the
vessel. Paste tends to be red or orange. Cruzado Carranza subdivides this type into four
sub-types based on designs on the surface: (1.1) those with zoomorphic designs on the
face or body of the vessel, (1.2) those with an anthropomorphic design along with other
designs, (1.3) those with “different designs,” and (1.4) those with anthropomorphic
representation. Colors utilized include black, red, white, dark red, and violet. Cruzado
Carranza points out that sometimes the white paint is added after firing, but the other
colors are painted on to the vessels prior to firing with the exception of the one sample
representing Type 8.

Huaura Style Type 2, or “Vasija ictomorfa,” vessels are zoomorphic figurines.
Paste is red, and the surface is burnished. The vessel is painted prior to firing. Designs are
made with black paint, and brush strokes are somewhat “indelicate.”

Huaura Style Type 3 vessels are globular pots with globular necks and designs
around the vessel. Bases tend to be convex, as does the neck. These tend to have
monochrome, bichrome, and polychrome designs on the upper body. The necks on these
vessels tend to be fully painted black. Designs are done in black lines with backgrounds
in white, dark red, and brown. While most of the paint was applied pre-firing, it appears
that sometimes white was added after firing and in smaller proportions and in concentric
circles and dots with a more delicate finish.
Cruzado Carranza’s Type 4 vessels are globular pitchers with a convex base, straight neck, and vertical handles on the side. Usually there are two fields of bichrome or polychrome “pictorial” decoration with one on either side of the vessel. There is an emphasis on anthropomorphic designs made of black lines with a white, red, and dark red background. Paste is red or orange. Surface treatment can be polishing or burnishing. Vessels are painted prior to firing.

Type 5 makes up only a small portion of Cruzado Carranza’s sample with just one figurine that is slipped in white and lacks extremities. The example from Cruzado Carranza’s study was both painted and slipped before firing. The female figurine was painted with geometric designs which cover the body and also include crosses and birds. These are painted in black and dark red. Cruzado Carranza suspects the reason that this figurine has been attributed to Huaura Style is because it contains design elements shared by the other vessels in the sample.

Type 6 vessels are globular pitchers with a convex base, two vertical or horizontal side handles, and a straight neck. Designs tend to be polychrome and placed around the upper body of the vessel. Paste is orange, and all examples from Cruzado Carranza’s study are burnished. The vessels are painted before firing, and painted decorations include geometric designs and staggered crosses which are made with black lines and a background of white, red, and dark red. A difference between Type 6 and other similar types within Huaura Style is that these vessels do not have black necks.

Cruzado Carranza’s Type 7 is a polychrome globular jar with a short neck, a lateral handle, with a base that is either convex or flat. Some examples are burnished while others are polished. Painting occurred prior to firing. Designs are mostly lines,
sometimes crossed lines, and circles on the central part of the vessel. These motifs are outlined in black paint, and the background is red and white. The paste for Type 7 vessels is red and orange.

Type 8, a plate, is represented by only one example in Cruzado Carranza’s assemblage. It has everted, flared sides with bichrome pictorial decoration on the exterior. There are two areas with designs on them, one on each side of the vessel. The design is a human face with a headdress and “apparent bird head appendages.” The designs are outlined in black paint. The paste is red, and the surface is burnished. Interestingly when compared to the other types analyzed by Cruzado Carranza, the sole example of Type 8 was painted after firing.

In Cruzado Carranza’s sample, Type 9 is represented by 6 keros. They have inverted, flared, or straight walls; flat bases; and polychrome decorations around the upper rim. The band of design along the rims is white with black designs on a red background. The painted designs around the top rim of the vessels tend to be geometric spiral designs, crosses, and concentric circles with dots. Of the sample, some vessels are burnished while others are polished. They were painted prior to firing. Paste is red or orange.

To reiterate, Cruzado Carranza’s pre-professional practicum results are summarized here because it represents the most thorough attempt to describe pottery that has been attributed to the Huaura style. Cruzado Carranza (2008) and Vallejo (2010) have both noted the lack of systematic study of Huaura style, a style that is often mentioned by scholars of the prehistory of the Norte Chico but has not been rigorously defined and
described (with the notable exception of Cruzado Carranza’s 2008 study which is a laudable start).

**Huaura Style and the Huaura Valley**

The literature reviewed above discusses the problems of pottery style definition, a lack of samples with known or reliable provenience information, and the need for a sequence tied to absolute dates for Huaura Style and the broader cultural sequence of the Norte Chico. It also highlights the fact that each of these studies relies on stylistic dating methods despite the lack of a secure sequence for this area. This means that such a connection requires extrapolations from pottery assemblages from distant regions and, possibly, the wrong time period. That is, relying on stylistic observations in an area without a dated pottery sequence and comparing the pottery to similar-looking assemblages from elsewhere with better established chronologies can be a an endeavor which gives misleading results. More specifically, it is problematic to compare Huaura Style, which has been assumed to date to the Middle Horizon, to similar pottery elsewhere that is securely tied to Middle Horizon radiometric dates. In the case of Huaura Style, the stylistic similarities and comparison to better known Middle Horizon Wari or Pachacamac pottery is supported by visual similarities between the styles, not shared date ranges. Vallejo (2010), Usera (1972), Cruzado Carranza (2008) and those initially responsible for categorizing the un-provenienced museum pieces Cruzado Carranza studied as belonging to Huaura style all appear to be attributing dates to pottery based on perceived similarities to perhaps more securely dated Middle Horizon pottery from elsewhere.
Recent work in the Huaura Valley has not ignored radiometric dating by any means, though. Brown Vega (Brown Vega 2008a; Brown et al. 2013) obtained several Early Horizon and Late Intermediate Period dates from samples excavated at the site of Acaray and provides a robust survey of the literature on the pottery from the area. She also shared her pottery analyses rubric on which she collaborated with Kit Nelson (Brown Vega 2008a:414). She provided drawings of both surface and excavated pottery collected during her excavations at Acaray as well as some interesting tables that illustrate how sherds with different decorative techniques were distributed through the site. Probably because the primary focus of Brown Vega’s study at Acaray was warfare, she does not provide extensive discussion of the pottery found at the site with relation to the AMS dates she obtained. Brown Vega does provide a thorough summary of findings with attention to pottery “form and design identification” within the appendices (e.g. Brown Vega 2008a:392-93), however, and her work at Acaray as well as in the broader Norte Chico is some of the most thorough to date in its attention to a variety of data collected from work at the site and the greater area.

Apart from the dates from Brown’s work at Acaray, few other recent or ongoing projects in the Huaura Valley have produced AMS dates. A notable exception is that Nelson and Bellido (2010:47) provided some useful date ranges for the sites of Quipico, Rontoy, and Chambara, but their publication focuses on botanical remains and subsistence information, not specifically on pottery, collected at the site. Tulane graduate students Stacy Dunn and Allen Rutherford are completing dissertation research on the Huaura sites of Quipico and Cerro Colorado, respectively, and it will be fascinating to compare the dates from the fortified site of Cerro Colorado which is less than a mile from
the coast, the dates from the mid-valley sites of Caldera and El Carmen given in this
dissertation, and the suite of dates from the site of Quipico which is further upstream and
inland and which contains large adobe *tapial* compounds (Pierce Terry et al. 2010; Dunn
and Heaton 2013; Pierce Terry and Rutherford 2013; Rutherford 2014).

**General characteristics of the pottery assemblage from Caldera and El Carmen**

Detailed attribute analysis was carried out on a total of 1,744 sherds and vessels from the excavations and surface collections at the Huaura Valley sites of Caldera and El Carmen (Figures 5.7-5.72). A description of the format of the attribute analysis of the pottery assemblage can be found in Chapter 4 of this dissertation while the specific attribute descriptions and associated codes are included in this dissertation as an appendix. The raw data collected during analysis of the pottery from Caldera and El Carmen could not be included in this dissertation due to the bulk of the data and difficulty in formatting it for legible presentation in a reasonable number of pages. However, the raw data is readily available upon request.

The lack of a secure understanding of the types and sequence for this valley is, in fact, a primary reason that attribute analysis was selected as the best way to collect distinct information on a variety of characteristics of each sherd analysed. With this data, attributes found to be indicative of certain types can be isolated and examined in order to answer specific questions.

To summarize the process utilized in the attribute analysis carried out for this dissertation, though, for each piece analyzed, a series of attributes such as vessel type, vessel part(s), estimated time period (admittedly not attributes per se, but rather interpretations of patterns in ceramic variability and associated contextual information),
construction method, paste color, rim type, rim diameter, surface treatment, etc. were observed and/or measured.

Because of the aforementioned problems in pottery style definition and lack of valley-wide chronology, anyone who may wish to look over the pottery data collected for this dissertation should take two aspects of the analysis in particular with a grain of salt as they are based on the general understanding of the researcher who has—as many scholars before her have—grappled with the style definitions and purported time periods in which these styles were utilized.

The first is the estimated time period. The options listed are as follows: not known (0), Initial Period (1), Early Horizon (2), Early Intermediate Period (3), Middle Horizon (4), Late Intermediate Period (5), Late Horizon (6), Colonial (7), and Late (8). During the collection of this data, Heaton estimated the time period or simply listed “0” for “unknown.” Because the term was estimated by the researcher in a region with loosely defined and overlapping styles, it cannot be emphasized enough that this is an estimate and that other recordable attributes are built in to the analysis in order to maintain utility of the data since the “estimated period” attribute is just that—an estimate.

The second is the common designation for the vessel type/style. The options listed are as follows: Early Horizon bright/strong red (1), Early Horizon reddish brown wares (2), Neckless pot (olla) (3), Burnished pattern of unknown association (4), Linear burnishing (Late Intermediate Period) (4.1), Multidirectional burnishing (Early Horizon) (4.2), White on red (5), Huaura style (6), Huaura Impressed (7), Chancay Polychrome (8), Cayash (9), Chancay black on white (10), Chancay yellow (without black designs, Late Intermediate Period) (11), Chancay-Inca (12), Middle Horizon polychrome (black
and white on red) (13), Black on red (14), White on orange (15), Combination of Middle Horizon polychrome and Huaura Impressed (16), Combination of Chancay Yellow and Huaura Impressed (17), and Indeterminate (99).

Both the estimated period and imputed parochial term for each sherd are based on the perception of the researcher. As the ambiguity of styles has been discussed elsewhere in this dissertation, it should be noted also that this analysis was formatted in such a way as to collect a suite of visible observations as well as measurable characteristics. Since a different piece of data was collected on each column of the database, relevant data can be parsed out from the dataset even if the estimated period or parochial term of a given sherd is incorrectly attributed.

The rubric for analysis was developed in collaboration with Kit Nelson and Stacy Dunn and based in large part on the analytical framework developed by Margaret Brown Vega in conjunction with Kit Nelson (Brown Vega 2008a:414-24) for Brown Vega’s dissertation on the Huaura Valley site of Acaray, an Early Horizon fortified site with a Late Intermediate Period component (Brown Vega and Rivas 2004; Brown Vega 2005, 2008a, 2008b, 2009a, and 2009b). While pottery is not the primary focus of Brown Vega’s dissertation, the framework developed for the analysis she performed as well as the descriptions and selection of drawings of both excavated and surface collected pieces (Brown Vega 2008a) are extremely useful.

It is hoped that similarities in methodology between Brown Vega’s work on the pottery at Acaray and subsequent analyses of the pottery assemblages from other Huaura Valley sites (e.g. Dunn 2011; 2013; Dunn and Heaton 2010, 2013; Rutherford 2014) will facilitate intra- and inter-valley comparisons which may eventually result in an
established pottery sequence for the norte chico that is based on excavated ceramics and tied to radiometric dates.

Of the 1,744 analyzed sherds and vessels studied, 1,020 came from Caldera with 589 of those from excavations and 431 from surface collections (Figures 5.7-5.33). From the remaining 723 analyzed sherds from El Carmen, 320 came from excavations while 403 were from surface collections at the site (Figures 5.34-5.72). It should be noted that El Carmen yielded less pottery as the excavations there were fewer and less deep.

The initial hypothesis under which this research began called for a comparison of the pottery from the purported Middle Horizon occupations at Caldera and El Carmen with other, better known and more studied assemblages from the Wari heartland (e.g. Anders 1986, 1989; Brewster-Wray 1990; Castillo 2000; Castillo 2000a; 2000b; Cook 1986; Glowacki 1996, 2005a; Knobloch 2000; Menzel 1964, 1976, 1977) and periphery (e.g. Anders 1986, 1989; Glowacki 1996; McEwan 2005; Moseley et al. 2005; Thatcher 1972). This was done in order to examine the level of connectedness shared by or interaction between groups in the Huaura Valley and groups whose material culture more securely tied them to the Wari polity during the Middle Horizon.

The findings of this analysis have been tied as thoroughly as possible to radiometric dates. Many sherds from ground surface and undisturbed contexts; these sherds are not directly factored into conclusions about timing but are useful for understanding the scope of materials present at the sites. The results of the radiometric dates from three samples collected from the excavations in Units 4 (n=1) in Sector A and Unit 5 (n=2) in Sector C at Caldera and from the five samples from excavated contexts at
El Carmen including Unit 1 (n=2) and Unit 2 (n=2) in Sector A and Unit 3 (n=1) in Sector B are detailed in Tables 5.1 and 5.2 of this dissertation.

The pottery sherds and vessels from excavations and surface collections at Caldera and El Carmen, respectively, do not closely resemble the surface treatments or decoration exhibited by the pottery found at Acaray (for comparison see Brown 2008a:381-413 for descriptions and drawings of surface pottery and 2008a:414-36 for the same treatment of excavated pottery).

The assemblage from excavations and surface collections at the Huaura Valley sites of Caldera and El Carmen contains pieces that appear to fall into one (or more) of the following categories: Huaura Impressed (e.g. Figures 5.14, 5.19, 5.27, 5.42, and 5.68), Huaura Style (see Cruzado Carranza 2008; Vallejo 2010; Shady and Ruiz 1979) (e.g. Figures 5.1-5.6, 5.29, 5.32, 5.42, 5.45-5.49, 5.54, 5.63, 5.64, 5.66, 5.68, and 5.69) Huacho Style (which Vallejo posits is derived from Huaura Style [Vallejo 2010:233]), Chancay polychrome (which also may be Huaura Tricolor (see Vallejo 2010 Figs. 9, 10, and 11), and Chancay black on white (e.g. Figures 5.16, 5.19, 5.23, 5.27, 5.44, 5.68) among others.

**Pottery Forms and Definitions of Styles**

To understand the pottery found in my excavations, an analysis of form is essential. The work of two academicians, Prudence Rice and Warren DeBoer, have served as valuable guides in informing this research. Rice’s *Pottery Analysis: A Sourcebook* (1997) provides the kind of analytical techniques that are applicable to the study of archaeological pottery assemblages anywhere in the world. Rice offers details
such as the difference between flatware versus hollowware, and she provides the details of pottery shapes as they vary by region. Her careful definitions of forms are what make her work a respected resource for both experts and novices in pottery analysis (1997:217). Complementing Rice’s work, Warren DeBoer’s (1996) well-organized study of the pottery and sequence for the Santiago-Cayapas region of Ecuador, offers detailed descriptions and drawings of pottery forms.

DeBoer (1996:30) based his seriation of the pottery of the Santiago-Cayapas region of Ecuador on more than 65,000 sherds. DeBoer (1996:1) describes the complicated nature of his project as follows: “The construction of a space-time framework for prehistoric Ecuador is a particular challenge. Unlike Peru to the south, ancient Ecuador was largely free of those periodic ‘horizon styles’ that serve to correlate regional cultural sequences.” His work on the assemblage from the Santiago-Cayapas was based on survey, surface collection, and excavations to explore the stratigraphy. In order to properly contextualize the sherds and produce the most meaningful analysis, DeBoer focused on diagnostic sherds and the effort to decipher the probable parent vessels from which each came. This process is easier with those diagnostic sherds such as rim, base, or other fragments which more readily indicate which kind of vessel they came from. He was able to draw more than 2,000 wholly or partially reconstructed vessel profiles, and the “phase-by-phase ceramic descriptions” he provides are based on these (DeBoer 1996:6).

Although DeBoer (1996:6) indicated that he preferred vessel-oriented pottery analysis, he acknowledged that analysis using sherds is also possible: “vessel-oriented analysis by no means precludes the utility of sherd-based typological approaches. The
latter, however, are not my preference.” The majority of pottery encountered during my work at El Carmen and Caldera in the Huaura Valley of Peru were fragmentary pieces. There were a few exceptions, as some whole or nearly-whole vessels were gathered from dog-and-leash surface collections or clearly looted contexts. They are alluded to in the description of looters’ pit cleaning and excavations elsewhere in this dissertation.

As I provide form descriptions for the pottery of my excavations, it should be noted that the corresponding images are contained in the figures which have been placed later in the document between the conclusions and appendices. Following form descriptions, I give a brief summary of the pottery types, loosely defined based on previous survey data, expected to be present in the analyzed sherds. These style descriptions and their estimated chronological placement were agreed upon at the outset of the analysis by Stacy Dunn, Kit Nelson and me since our excavations were all within 20 kilometers of each other. We then used these agreed chronological placement estimates on our respective sites: Quipico by Stacy Dunn; Rontoy, Centinela, and Chambara by Kit Nelson; and Caldera and El Carmen by me.

The definitions of the pottery forms at the Huaura Valley sites of Caldera and El Carmen are largely modeled after Rice (1987:212-24). The vessel proportions, also based on Rice (1987:216, Figure 7.4), are sketched within the attribute analysis guide utilized in this study of forms. The vessel proportion sketches include bowls, flaring (concave-sided) bowls with a ring base, ollas, jars, spherical (globular) jars, vertical (ellipsoid) jars, short-necked jars, canteens, keros, and goblets.

While a significant proportion of the pottery sherds and vessels collected during the excavations and surface collections at El Carmen and Caldera were analyzed, the data
are based on the attribute analysis of 1,744 specimens, about half of which are from excavated contexts. This is a small number when compared to the 65,000 pieces DeBoer’s much larger analyses (DeBoer 1996) relied upon, but it is a foundation for future pottery analysis in the Huaura Valley.

Following the lead of those who have done archaeological pottery analysis before, I provide definitions of the forms encountered in my study of the pottery from Caldera and El Carmen. It seems appropriate here, though, to mention DeBoer’s distaste for written definitions of form and his predilection for images: “In developing vessel shape categories, I have no particular classificatory theory to espouse. I prefer to draw pottery rather than to talk about it, and the shape distinctions made in this volume should be evident to even the most casual of viewers. In fact, if I could get away with it, I would avoid words altogether and engage in the more ‘telling’ medium of pictures” (DeBoer 1996:8). With the goal of being as thorough as possible, I attempt to define the forms through both words (below), but the images of the pottery from both excavated and surface collected sherds are a more rich representation of the assemblage.

**Definition of Forms**

**Holloware versus Flatware**

Especially in body sherds which can give few hints about the parent vessel, sometimes only designations of “flatware” or “hollowware” were possible. This division of flatware versus hollowware alludes to whether or not a parent vessel enclosed its contents (Rice 1987:217). That is, by this scheme, a plate (or bowl or kero) is an example of a flatware, whereas a jar or olla is a hollowware. Flatwares such as plates and bowls
could have surface treatment or decoration on interior or even the interior and exterior. By contrast, hollowares—which enclose their contents—tended only to have decorative treatment on their exterior since that was the visible part of the vessel. Whenever additional information such as rim or handle could be gleaned from a sherd, and when that information indicated a probable parent vessel type for the sherd, the sherd was of course given a more specific designation such as jar or bowl instead of the fairly generic flatware versus hollowware sherd categorization.

**Plate**

A plate is a type of flatware. It is shallow in depth with an unrestricted orifice. According to Rice’s (1987:216) definition, “A plate has a height less than one-fifth its maximum diameter.”

**Bowl**

While Rice’s definition of a bowl describes this form as having either a restricted or unrestricted orifice, for the purposes of the analysis of the Huaura Valley pottery, a bowl is another type of flatware with “its height varying from one-third the maximum diameter of the vessel up to equal to the diameter” (Rice 1987:216). She further notes a significant alteration to this widely used definition is that “bowls may have collars, but they do not have necks” (1987:216). In this research, both bowls and plates are considered flatware. While Rice’s definition of a bowl includes ollas, a form with an incurving shoulder or rim that gives a somewhat restricted orifice, ollas are considered as a different but related form which is described below.

**Olla**
Kroeber (1926) called the olla an incurving bowl. An olla is a bowl with a restricted orifice, so it is a hollowware. For the purposes of this research, the incurving of the upper portion of the vessel that gives it a slightly restricted orifice is what differentiates it from a bowl.

Jar

A jar is another category of hollowware. Rice (1987:216) provides a definition of a jar as “a necked (and therefore restricted) vessel with its height greater than its maximum diameter.” Rice (1987:217) points out problems with too strictly applying this definition since proportions can result in a neckless jar which does not exist by this definition; however, no “neckless jars” were encountered in the course of this research. That said, sherds from short-necked jars were recorded in the course of these analyses, but hopefully the data collected through detailed attribute analysis will allow others to reclassify or further define this subcategory of hollowware if necessary.

Sometimes the characteristics of the sherds—such as the presence of partial or full necks and rims—allowed us to place them in subcategories. The subcategories of jars identified in this research include spherical (globular) jars, bubble-necked jars, bubble-necked jars with double level necks, and a short-necked jar which may also be called a goblet.

Canteen

For the purposes of these analyses, a canteen is a separate category of hollowware because the canteen form is known from the latter periods of prehistory in the Andean region (Nelson personal communication 2010). It could just as easily be considered a subcategory of the jar form with an oval or compressed body resulting in a wider front.
and back in contrast to more slender sides. Only one clear example of a canteen was encountered during these analyses.

**Kero**

A kero is another common Andean form that would likely be considered a vase in many other parts of the world (Lothrop 1956). The kero is a flatware by the flatware-versus-hollowware distinction as it does not have a restricted orifice. The two basic subdivisions of keros encountered in the assemblages from Caldera and El Carmen were straight versus flaring (concave-sided). Some ornate examples of keros could be considered to have a restricted orifice because the walls flare so much that the diameter of the body is smaller than the base diameter (therefore giving a kind of restricted orifice though the rim is distinctly wider than the base), but such specimens were not present in this assemblage.

**Goblet**

The goblet is a comparatively ornate form in the attention given to the elongated base, the body which is often globular, and the neck and rim (Nelson Personal Communication 2010). This is a form named for examples which are seen—in metal instead of pottery—in movies depicting Medieval scenes. Only two possible goblet specimens were identified in this research.

**Gigante**

This is an informal name for vessels which are massive in both wall thickness (14-30mm) and body and rim diameter (33-42cm). These are huge, coarsely made ollas and/or bowls of probable coil construction with rock temper. These vessels probably
served as storage jars and were buried in the ground with the orifice placed at the ground surface level so the stored contents could be accessible.

Because there were a total of 18 sherds that fall into this category, and all of these specimens came from El Carmen, and the fact that these sherds only represent a comparatively tiny fragment of the whole vessel, I am hesitant to categorize the gigantes as either flatware or hollowware. Gigante sherds had no discernible interior or exterior embellishment which would be helpful in pointing to whether the focus was on the interior or exterior. Most interior and exterior surfaces were scraped or, at most, smoothed. One sample had clear evidence of slip on the interior.

Four of the eighteen analyzed gigante fragments were rim sherds with sufficient percentage to measure the overall rim diameter. Based on these examples, the rim diameter of gigantes ranges from 33 and 42cm. For comparison, other rim sherds from the assemblage at Caldera and El Carmen were smaller, ranging from 8-15cm in diameter. No base sherds from gigantes were knowingly recognized.

**Figurines and Miscellany**

Neither Rice (1987) nor DeBoer (1996) provide a strict definition for ceramic items that fall into the figurine category. Thus, for the purposes of this research, the definition is assumed to be understood as a model of a human or animal rendered in clay. Ten fragments of figurines were analyzed from the assemblage from Caldera and El Carmen, and these include examples of both hollow and solid figurine fragments. Seven of the ten are from surface collections and profile cleaning, while the other three are from Caldera’s Unit 5a, Level 1 and seem to be part of a ceramic flute.

**Indeterminate**
The parent vessels of some sherds were indecipherable even at the basic level of flatware versus hollowware, so those received the designation of “indeterminate” for form.

Definition of Styles

As has been mentioned elsewhere, a major goal of this attribute analysis of pottery from the sites of Caldera and El Carmen was to produce data that could be useful on its own as well as in both intra- and inter-valley comparisons. It is for this reason that I closely collaborated with fellow Tulane graduate student Stacy Dunn as well as with Kit Nelson, an archaeologist who had begun working in the Norte Chico in 2002 and whose focus on archaeological ceramics had begun in the 1990s (Nelson personal communication). At the outset of the pottery analyses which would take place concurrently, the following styles were roughly defined as follows. (As with the form determination, the analysis of the assemblage from Caldera and El Carmen regards the assumed style as only one of many attributes recorded. That is, if the assumed style is inaccurate or the founding loose definition of the style is inaccurate, there are still many other relevant qualitative and quantitative attributes recorded for each sherd.) The styles listed below are not all necessarily associated with Huaura Style itself but are styles we anticipated we might encounter during attribute analysis.

Early Horizon Bright/Strong Red

For the purposes of this research, Early Horizon bright/strong red pottery from the Huaura Valley is thought to have been characterized by strong reds, vivid in color. These
are distinct in comparison to reddish brown also thought to be associated with the Early Horizon.

**Early Horizon Reddish Brown Wares**

The Early Horizon reddish brown wares are characterized by deep red and brownish colors. Sherds often show cracked surfaces because the slip is very thick. These sherds often show deep fireclouds, and this appears to be due to the lack of strictly controlled heat as the vessels were fired. The temper tends to be very fine, usually 1mm or smaller. The surfaces are often smoothed and burnished. A caveat in the definition of this style is that it was only to be attributed to a sherd if the above-mentioned details were clearly identifiable.

**Burnished Pattern of Unknown Association**

Pottery possessing brown or red color with a burnished pattern is classified as Burnished Pattern. Sherds of this appearance may be associated with the Early Horizon. That said, it is also likely that burnished wares in these colors were also present at Huaura Valley sites in later periods.

**White on Red**

Sherds with white slip or paint on a red surface are classified as White on Red. Pottery of this appearance may date to the Early Horizon or Early Intermediate Period.

**Huaura Style**

Huaura style pottery is characterized by polychrome designs reminiscent of Middle Horizon or SAIS characteristics. Dates for this pottery span from the Middle Horizon to the Late Intermediate and even to the Late Horizon.

**Huaura Impressed**
The “impressed” portion of the name Huaura Impressed is a misnomer, as these vessels were likely made with molds. They often present raised dots something akin to Chicken Pox. Huaura Impressed pottery seems to have been produced in the Middle Horizon on through the Late Intermediate Period and continuing into the Late Horizon. For this analysis, if a sherd has the raised dots as well as Chancay black on white or Chancay yellow coloring, the vessel should still be categorized as Huaura Impressed, and the timing can be assumed to be the Late Intermediate Period.

Cayash

Cayash sherds have a distinct, shelf-like collar. These sherds date to the Late Intermediate Period.

Chancay Black on White

This appears to be the signature pottery of the Chancay style. The dark paint may look faint and appear brown or even grayish. For such instances this is the remains of the binder, and the black paint has worn off. The white of Chancay black on white may be slightly yellowish. Chancay black on white style dates to the Late Intermediate Period.

Chancay Yellow

Chancay yellow sherds show no black designs and are sometimes sherds from Chancay black on white vessels that do not happen to have any black on the field, but it is impossible to tell if the parent vessel had paint on it or not with only a white sherd as evidence. Chancay yellow dates to the Late Intermediate Period.

Chancay Polychrome
This style can resemble a less tidy version of Huaura style or even Chancay black on white with some color, usually red and black and yellow. This style may date to the Middle Horizon.

**Chancay-Inca**

These vessels are usually unpainted. They can be slipped or unslipped but are at least smoothed. Slip, when present, is a greenish yellow. Associated forms are oddly formed jars and goblets. Most forms do not have any sharp turns but instead have smooth edges. Vessel walls tend to be very thin. Appliqué is a common decorative element. Chancay-Inca pottery dates to the Late Horizon.

**Unknown**

When a sherd did not appear to fall into any of the abovementioned categories—or it was unclear which category it should be placed in—the parochial designation was listed as unknown.

**Notes on Sequence**

In his work based on 65,000 sherds, DeBoer (1996: 26-30) has the following thoughts on seriation: “By seriation is meant the placement of sets of associated artifacts in a series based on their similarity wherein the order of the series is believed to represent change over time. Phrased as such, seriation commits itself to culture as a learned, even quasi-genetic, entity that is transmitted with considerable fidelity, but never flawlessly, from generation to generation. In the seriational scheme of things, any contemporary constellation of cultural traits embodies simultaneously legacies from the past and harbingers of the future.”
This is a useful description of seriation that includes an important acknowledgment of change over time. This same work has the benefit of relying on tens of thousands of sherds—complete with 2,000 partially or wholly reconstructed vessels—as a dataset (DeBoer 1996:6). DeBoer’s analysis of this huge sample showed that paste, wall thickness, pigmentation, base forms, vessel forms, and a few other features varied systematically with time (DeBoer 1996:30-39). The seriation of pottery with specific similarities helped the team divide the pottery from the region into Mafa, Selva Alegre, Guadual, Herradura, Las Cruces, Mina, Tumbaviro, and Chachi-Cantarana phases.

Recent excavations and surface collection at the Huaura Valley sites of Caldera and El Carmen produced an interesting assemblage for analysis, and 1,744 sherds were collected. As is discussed elsewhere in this dissertation, excavations were limited to the following: (1) three units and 1 looters’ trench at El Carmen, (2) six units at Caldera, and (3) 10-11 1m diameter dog-and-leash surface collections at each site. Not surprisingly, about half of the analyzed sherds came from excavations while the other half came from surface collections which are obviously without specific context beyond site surface. Considering the disturbed nature of some of the excavation units (noted elsewhere), the samples of analyzed sherds from secure contexts—as opposed to looted or surface contexts—is comparatively low and could be limited to a couple hundred sherds from the sites. Further, a significant proportion of the sherds from secure contexts are plain body sherds which elude specific form/type designations. Because of this, it would not be a statistically significant endeavor to attempt a proper seriation of these materials. Instead, at this stage, we have a general understanding of timing of some types based on a tight suite of AMS dates from Caldera and El Carmen.
CHAPTER 6: CHRONOLOGY

When a pottery chronology tied to absolute dates exists for a site or region, relative dating of newly excavated materials can be a safe methodology for associating relative dates with a chronological sequence. For a region without the benefit of a well established cultural sequence with supporting chronological dates, radiometric dating is crucial to confirm the timing of occupations.

The Huaura Valley, though the subject of increased archaeological research in recent decades, does not have a detailed sequence with supporting absolute dates. Rather, much of the archaeological investigation of this valley is based on perceived stylistic relationships with assemblages from elsewhere as well as looted pieces or vessels without provenience information. In the absence of a valley- or region-wide sequence, there is a tendency to name newly encountered types after the site or valley within which they were found. The need for a pottery chronology tied to chronometric dates has been advocated elsewhere in this dissertation but bears reiteration here.

The specific contexts of the three samples from Caldera Units 4 and 5 (n=2) as well as the five samples from Units 1 (n=2), 2 (n=2), and 3 are described in greater detail in the above section on excavations. The provenience information is also summarized in the tables.

The samples from contexts in sectors A and C at Caldera yielded AMS dates that link the occupation of the site to the Late Intermediate Period or even to the latter half of the Late Intermediate Period. None of the excavated contexts date to the Middle Horizon, which suggests that these sites may have appeared rather suddenly during the Late Intermediate Period. The dates from the adobe *tapial* structure with rounded east and
west walls and an embellished doorway in the center of its eastern wall link occupation of this adobe *tapial* structure at El Carmen to the Late Intermediate Period. In fact, of the dates from contexts within comparable architecture at the sites of Caldera and El Carmen, the date of El Carmen may place the occupation at El Carmen slightly earlier than that of Caldera, but that cannot be confirmed without additional dates from both sites.

El Carmen also provided two other dated samples from Sector A of the site, but these samples were excavated within fieldstone architecture and fall a bit earlier in time. Looking at the dispersal of the dates calibrated with 2-sigmas, though, a finite statement regarding which occupation(s) or architecture preceded another cannot be made.

**Contextualization of the Dated Occupations in the Huaura Valley Sites of Caldera and El Carmen**

The Huaura Valley as well as neighboring regions to the north and south clearly show a significant increase in the number of sites dating to the Late Intermediate Period (e.g. Cardenas 1987/88, Nelson and Ruiz Rubio 2005). This information is particularly relevant when considering the significance of Caldera and El Carmen because it shows how densely occupied this valley was during the Late Intermediate Period. Brown Vega et al. (2013:9) have used the radiometric dates acquired from eight fortifications in the Huaura Valley to study conflict in the area and have suggested that the Chimú and Inca empires "may have had an overlapping presence in the Huaura Valley." In light of the fact that there is a tradition of dating archaeological sites based on the pottery styles present therein, these new chronometric dates from the valley more concretely support the suspected conflict during the later Late Intermediate Period in the Norte Chico region.
The areas associated with dispersal of Chancay, Casma, and Chimú ceramics, respectively, end at or near the Norte Chico (Bria 2006). This fact highlights the importance of studying this area to understand the articulation of the associated Chancay, Casma, and Chimú and potential shifting of political affiliations during the Late Intermediate Period. From Nelson and Ruiz Rubio’s survey report (2005) of the Huaura Valley which tentatively dates approximately 35% of the identified sites to the Late Intermediate Period, Brown extrapolates that the Late Intermediate Period must have been a time of more dense settlement than that indicated for prior periods with the caveat that these Late Intermediate Period occupations may be covering the remains of previous settlements which would affect the perceived abundance of earlier versus later sites (Brown 2008a:45-46). The combined knowledge that the Huaura Valley was more densely inhabited during the Late Intermediate Period paired with the apparent shifting power structures during the late Middle Horizon throughout the subsequent Late Intermediate Period indicate that the comparatively well-preserved Huaura Valley sites of Caldera and El Carmen are uniquely positioned—temporally and geographically—to help scholars better understand the changes in settlement patterns and potential political affiliations during this time in Andean prehistory. In order to contextualize the sites, the Casma, Chancay, and Chimú polities must be discussed.

**Casma Polity**

Vogel’s work in the Chao and Casma Valleys has produced significant evidence of changing political alignments during the transition from Middle Horizon to the Late Intermediate Period (Vogel 2011, 2012). During this time, as Vogel (2012:6) *not in*
The Casma polity is associated with the late Middle Horizon as well as the Late Intermediate Period and extended from the Chao to the Huarmey Valleys (Vogel 2011). It extended from coastal valleys from Chao south to Huarmey (Vogel 2012:6) which is north of the Huaura Valley as well as the other valleys in the Norte Chico. Some scholars have suggested the Casma polity spread as far south as the Pativilca Valley (Bria 2006) or even the Huaura Valley (Brown Vega 2008a: 54-56, 299-311) Vogel, argues that, “…the Casma polity appears to have come to power after the collapse of the southern Moche and was contemporaneous with the Wari state and the Lambayeque polity, as well as with the nascent Chimú state prior to their imperial expansion. Of course, they also would have been the northern neighbors of several central coast polities such as the Chancay and Ychsma” (Vogel 2011:205). Vogel’s excavations in the Chao and Casma Valleys have produced ceramics that indicate that the Casma polity had ties with surrounding cultures (2011:205) and help broaden the understanding of the transition between the Middle Horizon and the Late Intermediate Period. She notes that Casma’s material culture exhibited “foreign” influences while maintaining a strong “cultural identity” (Vogel 2011:202). The dates from Sector A at El Purgatorio in the Casma Valley range from A.D. 1150 to 1400, with one Middle Horizon date from an earlier construction phase (2011:207).

Because the material culture plays an important role in understanding archaeological cultures—and, in many cases, their interactions with other groups—a very brief summary of Casma pottery and architecture is provided here. There are four
different decorated types of Casma pottery. These are Casma Incised, Casma Molded, Black-White-Red, and Serpentine Appliqué (Vogel 2011:209). Though there is variation in the architecture, Fung and Williams (1977) described Casma architecture as being characterized by internally subdivided compounds, platforms, and rectangular patios. All of these features were joined together by terraces. Construction techniques also varied but often included thick stone walls in addition to adobe walls on top of stone foundations (Vogel 2011:205, 212).

Many ceramic vessels at El Purgatorio “show a range of cultural influences, sometimes even combining elements from multiple styles on one vessel” (Vogel 2011:213). Vogel interprets the relative prevalence of hybrid vessels as an indication of a significant amount of interaction between Casma and its neighbors (2011:218).

**Chimú Empire**

The Casma Valley has been thought to be the southernmost valley with evidence of direct control by the Chimú polity as indicated by “ten administrative centers and five villages” (Mackey and Klymyshyn 1990:196) with the site of Manchan being the “regional capital of the southern part of the empire” (1990:196-197). It should be noted that other scholars (e.g., Lumbreras 1974; Shimada 2000) have suggested that the Norte Chico site of Chimú Capac in the Supe Valley represents the southern limit of Chimú expansion (Bria 2006; Brown 2008a:36).

The Chimú empire is postulated to have grown through two stages of expansion, with the second stage subdivided into three phases (Mackey and Klymyshyn 1990:197): “(a) those valleys where Chimú power had been consolidated (Nepeña through Casma); (b) those valleys where consolidation had been initiated but not completed (Culebras
through Huaura); and (c) those valleys where no consolidation of Chimú power occurred (Chancay through Chillón)” (Mackey and Klymyshyn 1990:207). This model has subsequently been called into question by Moore and Mackey who have suggested that the consolidation of the Chimú heartland from AD 900-1200 was followed by a northward expansion to Jequetepeque by AD 1320, a southern expansion to Casma by AD 1350, another northward expansion north from Jequetepeque to La Leche between AD 1360 and AD 1400, influence in the form of trade or exchange among elites to Tumbes before AD 1450, and expansion south of Casma to the Chillón Valley being “uncertain” (2008:789).

Chimú’s expansion involved varying levels of control. When occupying the Casma Valley, the Chimú made changes which influenced settlement configurations and the use of resources. The existing economic and governmental traditions were not completely altered by these changes, however. At El Purgatorio, the Chimú built their own structures. The Chimú also built their own regional center—Manchan. However, the Chimú continued using seven of eight settlements dating from the Late Intermediate Period, and they inhabited four settlements from the Middle Horizon. (Mackey and Klynyshyn 1990:196-98)

A date from the earliest compound at the site of Manchan is 665 ± 75 BP, and this has been recalibrated to A.D. 1305. This early phase of Manchan post-dates the stone architecture at El Carmen which is dated 710 ± 25 and 730 ± 20, respectively, which calibrated via OxCal with a two sigma degree of certainty, fall at A.D. 1282 – 1388 and 1279 – 1382.
As was stated earlier, the Casma Valley is considered southern boundary of the “consolidation of power” of the Chimú empire (Mackey and Klymyshyn 1990:207). The Fortaleza de Paramonga in the Fortaleza Valley (in the Norte Chico north of the Huaura Valley), “is possibly a Chimú fortress, suggesting that the Fortaleza-Pativilca-Supe region could have been a buffer zone” (Mackey and Klymyshyn 1990:207). Mackey and Klymyshyn state that there are only three possible Chimú sites in the region of the Huarmey and Huaura valleys, and this includes the aforementioned Paramonga, which has also been associated with the Inca (Brown Vega 2008a:36).

Some examples of Chimú pottery have been found south of the Chancay Valley in the Chillón, but these finds alone do not suggest direct control of the Chimú in Chancay territory (Brown 2008a:33; Moore and Mackey 2008:796-797).

**Chancay Polity**

Chancay culture is thought to have developed in the the Huaura, Chancay, and Chillón valleys on the coast of Peru preceding and during expansion of the Chimú (Krzanowski 1991). In the polity’s southern expansion, the Chimú did not establish direct control over the Chancay or Chillón valleys. Based on the literature, Dulanto has postulated that the Chillón Valley to the south of both the Huaura and Chancay valleys was a kind of “buffer zone” between Chancay-dominated areas and the central coast Yschma polity (Dulanto 2008:768) which led Brown Vega to conclude that “the area of Chancay is hypothetically the farthest south the Chimú Empire reached” (Brown 2008a:33).

Chancay black-on-white ceramics were first identified by Uhle, and he defined it as late in the prehistory of the Andes (Krzanowski 1991a:21). Pazdur and Krzanowski
(1991:131) posit a concurrent development of Chancay black-on-white and Lauri Impressed wares during the Late Intermediate Period, but, as Brown Vega (2008a:55-56) later points out that it is difficult to link these variations of style necessarily to different groups of people. But researchers working in the region have done so.

The “geographical sphere” of the Chancay polity is based on the distribution of Chancay black-on-white ceramics (Brown 2008a:37), though it is worth noting that black-on-white sherds are found further afield including in the Nepeña Valley (Proulx 1973). Brown (2008a:37) also points out the presence of Chancay burials in the Supe Valley. Pazdur and Krzanowski’s radiocarbon dates tie Chancay black-on-white ceramics to a period spanning from A.D. 958-1451 (1991:127). Bria (2006) has noted that this style developed concurrently with or slightly later than the Casma styles to the north.

**Contextualization of the Architecture and Pottery at Caldera and El Carmen**

The previous section provides a brief summary of the geographical expansion north of the Norte Chico and time periods associated with the Casma polity and the Chimú polity that conquered Casma. The previous section also provides a brief exploration of the Chancay polity and its known chronology. With the Chancay and Chillón valleys to the south of Huaura, the southernmost valley in the Norte Chico, and the Casma and Chimú in succession controlling much of the coastal valleys to the north, where does that leave the Huaura Valley?

At the most general level, the sites of Caldera and El Carmen were visibly affected by the changes underway in the polities to the north and south of the Norte Chico. Around this time, though it cannot be said for certain without additional AMS dates from secure contexts, it appears that fieldstone architectural traditions at the mid-
valley site of El Carmen were altered or abandoned in favor of adobe tapial or adobe brick structures with embellished doorways. Since the landscape at and around El Carmen is literally covered in scree, it is unlikely that the inhabitants of the site simply ran out of raw material for constructing buildings out of stone; rather, it would have taken significantly more effort to collect and sift the raw material for adobe and transport it into the site for construction. The change indicated by the dates from excavations at El Carmen shows that inhabitants were in the midst of altering how they built their environment sometime in the late Fourteenth Century.

Brown notes that burnished blackware ceramics of the Chimú-style are not commonly found in the Huaura region (2008a:55-56). This observation was corroborated by analysis of excavated and surface collected sherds from Caldera and El Carmen. Only one piece of burnished blackware was identified, although this piece was striking in that it was a largely intact, flaring kero.

Cayash style pottery was initially identified as Late Intermediate Period during the 1978 Polish Scientific Expedition to the Andes in the upper Chancay and Huaura-Checras regions (Krzanowski 1986). Cayash sherds are common at sites further from the coast in the Huaura Valley such as at Quipico (personal communication Dunn 2010) cite reports or conference paper instead, but only one Cayash rim sherd was found during the excavations at Caldera and El Carmen.

Chancay black-on-white pottery is prevalent on the surface of both Caldera and El Carmen which suggests interaction between the inhabitants of these valleys. The pottery found at Caldera and El Carmen, however, cannot be sourced to determine if it came
from the Huaura Valley or if it was imported from the south because no kilns or molds
were found at either site.

The excavations at El Carmen provide dates of 710 ± 25 and 730 ± 20 BP in the
internally subdivided stone architecture. The single-room adobe *tapial* structure with an
embellished doorway at El Carmen provided two samples that dated to 660 ± 20 BP.
Given that two samples from each unit provided dates that were very close, but suggest
that the stone architecture predates the adobe *tapial* architecture at the site, it appears that
construction techniques at El Carmen shifted from stone to adobe *tapial*, which would
have been more costly to bring in to the site.

Two different types of architecture are seen at Caldera, both based on adobe. One
is adobe bricks with adobe mortar, and the other is adobe *tapial*. There are some
internally subdivided compounds, but more often the architecture is composed of single
cells which sometimes share walls (but are not compounds due to the obvious lack of
perimeter wall). The samples from Caldera provided dates of 620 ± 20 (two samples from
different contexts) and 610 ± 20 uncalibrated BP. Whether variation in brick versus *tapial*
adobe architecture at the site indicates a temporal shift in construction methods is at
present unclear, given the close dates.

Though the AMS dates from the sites of Caldera and El Carmen require a revision
of previously hypothesized Middle Horizon occupation of the Huaura Valley (e.g.,
Vallejo 2010; Nelson et al. 2010) excavations conducted by this project provide data that
can be used to help address the following problems (1) the definition and chronological
placement of Huaura Style pottery, (2) the temporal placement of the seemingly unique
pattern of adobe architecture with embellished doorways found at multiple sites in the
valley, and (3) the relationship of these Late Intermediate Period sites to other Late Intermediate Period occupations in the valley and in the region.

Mapping, excavations and surface collection, and subsequent materials analyses call into question the purported association between the adobe architecture with embellished doorways and its association with red, black, and white polychrome pottery, thought to date to the Middle Horizon in the Huaura Valley (Heaton and Dunn 2010; Nelson et al. 2010; Pierce et al. 2010). Samples from floors, hearth features, and occupational surfaces taken for radiometric analysis from the Huaura Valley sites of Caldera and El Carmen all date well into the Late Intermediate Period (with the exception of one Historic Period outlier from a sample taken from a disturbed or reinhabited fieldstone structure in sector B of El Carmen).
CHAPTER 7: CONCLUSIONS

The research presented in this dissertation builds upon the previous work of other scholars (Bria 2006, 2009; Brown Vega 2005, 2006, 2008a, 2008b, 2009a, 2009b; Cárdenas 1977, 1977/78, 1978, 1988; Cruzado Carranza 2008; Dulanto 2008; Horkheimer 1962; Jennings 2010; Kroeber 1926; Krzanowski 1986, 1991; Llanos and Shimada 2010; Mejía 1953; Menzel 1976; Nelson and Bellido 2010; Nelson and Ruiz Estrada 2007, 2010; Nelson and Ruiz Rubio 2005; Nelson et al. 2010; Ruiz 1981; Shady and Ruiz 1979; Schreiber 1992; and Vallejo 2004, 2010), in addition to ongoing research (e.g. Brown Vega et al. 2011; 2013; Dunn 2011; Dunn and Heaton 2013; Nelson et al. 2011; Pierce Terry and Rutherford 2013; Rutherford 2012, 2014). Even with the strong existing and continuing work in the Huaura Valley, though, it is likely that none of the aforementioned investigators would have predicted the results of our excavations at Caldera and El Carmen. As noted previously in this dissertation, analysis of materials and dating of excavation contexts place the occupation of these two sites in the Late Intermediate Period.

The main difference between this and previous studies of Caldera, El Carmen, and other Huara Valley sites (e.g. Cruzado Carranza 2008; Stumer 1952; Usera 1972) is that the results of this project are based on excavated pottery in addition to surface collections, instead of simply on surface collected sherds and vessels without secure provenience. Importantly, excavations at Caldera and El Carmen also yielded samples for radiometric dates providing for the first time the basis for an absolute chronology for architecture and ceramics at these sites.
If there were previous Middle Horizon occupations of El Carmen and Caldera (which is possible since this dissertation project could not utilize full-scale horizontal excavations), such contexts were not encountered during this project. Except for one very late outlier from El Carmen, the remaining three dates from Caldera and four dates from El Carmen are clearly clustered in the Late Intermediate Period. The way the dates fall suggests the following:

1. Adobe *tapial* (poured adobe) architecture with embellished doorways is a Late Intermediate Period phenomenon in the Huaura Valley and not a Middle Horizon indicator.

2. Huaura Style, a poorly known pottery style long associated with the Middle Horizon occupation of the Huaura Valley (Cruzado Carranza 2008; Stumer 1952; Vallejo 2010) because of the style’s focus on the colors red, black, and white as well as iconography which bears some similarities to iconography linked to the Wari empire (Nelson et al. 2010:171), now can be attributed to the Late Intermediate Period, at least at El Carmen and Caldera. However, the limited excavations conducted at El Carmen and Caldera do not necessarily negate the possibility that Huaura Style pottery was in use during the Middle Horizon as well, since no excavation units at these sites produced Middle Horizon dates. It, of course, is possible that Middle Horizon pottery was incorporated into the fill underlying the surrounding Late Intermediate Period structures.

3. Of the five dates from El Carmen, two came from a unit in an adobe *tapial* structure in sector A on the west side of the site, two from a unit in fieldstone architecture also in sector A, and one from a unit in fieldstone architectural
complex in Sector B. The sample from Sector B yields a Late Horizon/ Historic Period date, and may represent a later re-occupation of the site or a contaminated sample. The four reliable dates from the excavations in El Carmen in the two main types of architecture—adobe tapial rooms with embellished doorways and extensive fieldstone complexes—fall closely enough together that it cannot be said for certain that the fieldstone architecture predated the adobe architecture as was previously suspected. Rather, the dates suggest that the tapial and fieldstone architecture may have been utilized simultaneously at El Carmen, although more dates would be needed to confirm this. More research on the types of architecture at El Carmen will have to be done in order to clarify whether one type of architecture preceded the other. Such research will also need to explore the possibility of reuse/reoccupation of preexisting architecture.

4. The only architecture at El Carmen or Caldera that may be public or monumental in character is a thick tapial wall at Caldera that has been largely destroyed. Alternately, this structure may be intrusive from a later period or from another group who moved to the site. This wall looks more like the walls at the up-valley site of Quipico where such tapial is seen in the perimeter walls of compounds of groups Dunn believes to be low-level elites (Dunn 2013).

5. The quebrada architecture at the sites of Caldera and El Carmen does not appear to be defensive in nature, but there is evidence of conflict or at least fear elsewhere in the valley during the Late Intermediate Period in the Huaura Valley as indicated by the fortified site of Cerro Colorado near the modern city of
Huacho (Nelson et al. 2011; Rutherford 2014) and the site of Acaray (Brown Vega 2008a; Brown et al. 2013) further inland.

6. No exotic materials such as lapis lazuli or spondylous shell were found in the excavations at Caldera or El Carmen. Evidence of interregional interaction is indicated only by the presence of several distinct pottery styles at the sites.

With the dates from Quipico published by Nelson and Bellido falling between CE 1365 and 1405 (Nelson and Bellido 2010:47) and future data from Stacy Dunn from the same site pending, one of several conclusions may be drawn regarding the prehistory of the Huaura Valley. (1) the Late Intermediate Period has two different groups with some overlapping pottery and architectural construction techniques (tapial): upper valley as represented at Quipico (Pierce et al. 2010; Dunn 2011) versus the lower valley as represented by El Carmen and Caldera, or (2) there are earlier and later architectural and ceramic styles in the Huaura Valley during the Late Intermediate Period, as suggested by the one Cayash sherd (common at the mid-valley site of Quipico) found in excavations at Caldera. Quipico has adobe tapial structures, but they are characterized as larger compounds with walls that are more than twice the thickness of those of El Carmen and Caldera, with the important exception of much thicker tapial in the center of Caldera and on the eastern side of El Carmen (discussed previously in Chapter 3). These walls may be intrusive, but it was not possible to explore them further, as they were largely destroyed by looting.

The value of previous studies on Huaura Style ceramics is not questioned here, but it is clear that the Huara Valley needs a pottery sequence tied to radiocarbon dates.
The work at Caldera and El Carmen was not extensive enough to produce such a chronology. The work does succeed however, in correlating floors and occupational surfaces, and embellished doorways to a series of radiocarbon dates.

**Future Directions**

The Huaura Valley is characterized by numerous archaeological sites, as has been demonstrated by aerial photos and ground surveys (Brown et al. 2011; Cardenas 1977-1978; Nelson and Ruiz Rubio 2005). Despite intensive looting, encroachment of modern occupations, and occasional flooding during El Niño events, the quality of preservation of archaeological materials is generally good.

Research in the valley which alludes to the Middle Horizon is based on survey data or excavations without corresponding radiometric dates (e.g. Shady and Ruiz 1979). Survey techniques generally rely on the relative dating of sites based on their surface characteristics including pottery and architecture, and excavations without chronometric dates by default rely upon relative dating.

Since the data in this dissertation calls into question the temporal contexts of both embellished doorways and Huaura Style pottery, both of which have been used previously to associate sites with the Middle Horizon (e.g. Nelson and Ruiz Estrada 2005, Pierce et al. 2010), survey data for the Huaura Valley need to be re-evaluated in terms of dated signifiers of a given time period in the Huaura Valley. The existence of Middle Horizon occupations in the Huaura Valley is not in question. What requires reevaluation, however, are the criteria used to assign time periods to sites which have only been surface collected and which do not have radiometric dates.
At present no detailed chronology linked to radiometric dates exists for pottery, architecture, or textiles for the Huaura Valley. The data gained from the excavations and analyses for this dissertation provides further evidence that such a sequence is needed. It is hoped that this small step forward with this nascent study at two sites might provide a beginning to a better understanding of this complicated period of prehistory.
Table 5.1. Table of AMS dates and their contexts from the Huaura Valley site of Caldera. Samples were analyzed by the Center for Applied Isotope Studies at the University of Georgia, and the dates were calibrated with CALIB 6.0 with Stuiver and Reimer (1993) and the Southern Hemisphere Calibration Curve (McCormac et al. 2004).

<table>
<thead>
<tr>
<th>Site</th>
<th>CAIS Lab sample ID</th>
<th>PICA sample ID</th>
<th>Unit</th>
<th>Level</th>
<th>Feature</th>
<th>Material</th>
<th>14C age, years BP</th>
<th>Calibrated 1-sigma</th>
<th>Calibrated 2-sigma</th>
<th>Archaeological Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caldera</td>
<td>9871</td>
<td>286</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>Charcoal</td>
<td>620 ± 20</td>
<td>1325 – 1404</td>
<td>1319 – 1411</td>
<td>Unit on exterior corner of adobe <em>tapial</em> structure. Sample taken from floor Feature 7 which was sealed beneath a later floor Feature 2. These floors appear to be re-flooring episodes for the alleyway between the northernmost structure at Caldera and the structure immediately to the south.</td>
</tr>
<tr>
<td>Caldera</td>
<td>9873</td>
<td>857</td>
<td>5b</td>
<td>2</td>
<td>none</td>
<td>Plant fragment</td>
<td>620 ± 20</td>
<td>1325 – 1404</td>
<td>1319 – 1411</td>
<td>Unit in the lowest sector of the site topographically. This sample of plant remains comes from excavation unit 5b and is ambiguously associated with Feature 24, 26, and 27, all floors in level 2 of this unit and its extension.</td>
</tr>
<tr>
<td>Caldera</td>
<td>9872</td>
<td>832</td>
<td>5b extension</td>
<td>2</td>
<td>24</td>
<td>Seed</td>
<td>610 ± 20</td>
<td>1328 – 1409</td>
<td>1321 – 1417</td>
<td>Unit in the lowest sector of the site topographically. This particular sample came from a 15cm extension southward in the southern room (5b) because intact floors were found. Feature 24, in which this seed was found, was a dirt floor with sandy clay texture and very compact.</td>
</tr>
</tbody>
</table>
Table 5.2. Table of AMS dates and their contexts from the Huaura Valley site of Caldera. Samples were analyzed by the Center for Applied Isotope Studies at the University of Georgia, and the dates were calibrated with CALIB 6.0 with Stuiver and Reimer (1993) and the Southern Hemisphere Calibration Curve (McCormac et al. 2004).

<table>
<thead>
<tr>
<th>Site</th>
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<th>Unit</th>
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<th>14C age, years BP</th>
<th>Calibrated 1-sigma</th>
<th>Calibrated 2-sigma</th>
<th>Archaeological Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Carmen</td>
<td>9877</td>
<td>795</td>
<td>1</td>
<td>3</td>
<td>31</td>
<td>Charcoal</td>
<td>660 ± 20</td>
<td>1317 – 1391</td>
<td>1301 – 1397</td>
<td>The excavation unit from which this sample was extracted was in adobe tapial (poured adobe) architecture. This sample was found during the excavation of Feature 31, the uppermost floor encountered in the unit.</td>
</tr>
<tr>
<td>El Carmen</td>
<td>9878</td>
<td>1514</td>
<td>1</td>
<td>5</td>
<td>39</td>
<td>Charcoal</td>
<td>660 ± 20</td>
<td>1317 - 1391</td>
<td>1301 - 1397</td>
<td>Sample from Feature 39, a floor feature which was below 2 floors (Features 31 and 35) and above one floor feature (Feature 46), so the context is a very secure one. No carbon was found in the earliest floor (Feature 46) in the excavation unit.</td>
</tr>
<tr>
<td>El Carmen</td>
<td>9874</td>
<td>970</td>
<td>2</td>
<td>2</td>
<td>40</td>
<td>Seeds</td>
<td>710 ± 25</td>
<td>1292 -1380</td>
<td>1282 – 1388</td>
<td>Excavation unit in field stone architecture. Sample of seeds from east profile of excavation unit, beside Feature 40, a cluster of stones mixed with ashes. Appears to be part of Feature 37 as it was directly attached to the northern edge of that feature. Feature 37 was a concentration of stones lined up in a square area containing earth mixed with ashes and scorched earth (probably a hearth). Seeds are probably burnt.</td>
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<tr>
<td>El Carmen</td>
<td>9875</td>
<td>976</td>
<td>2</td>
<td>3</td>
<td>48</td>
<td>Charcoal</td>
<td>730 ± 20</td>
<td>1284 – 1376</td>
<td>1279 – 1382</td>
<td>Excavation unit in field stone architecture, and PICA Sample 970 was found above this one in the same excavation unit. This sample of carbon came from Feature 40, which was a patch of ash with some remnants of worm eggs and seeds as well as some carbon.</td>
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<tr>
<td>El Carmen</td>
<td>9876</td>
<td>990</td>
<td>3</td>
<td>2</td>
<td>none</td>
<td>Wood</td>
<td>200 ± 20</td>
<td>1671 – 1804</td>
<td>1661 – 1951</td>
<td>Excavation unit in a large, multi-room fieldstone complex in the center of the site (a high ground within the quebrada). The sample came from level 2 which was ground level with gravel, sand and silt, medium and large stones, with compaction varying between compact and semi-compact, suggesting it may have been a living surface. This level was on top of a more compacted surface, so it also may have been deposited later.</td>
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Late Intermediate Period and Late Horizon Dates from the Huaura and Chancay Valleys

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<tr>
<th>Code</th>
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Table 5.3: Late Intermediate Period and Late Horizon dates from the Huaura and Chancay Valleys in uncalibrated radiocarbon years BP from (modified from Brown 2008a:247-48). Pazdur and Krzanowski (1991) have called the dates of Cardenas (1988) into question (see also Brown 2008a:48, 230)
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Wall of adobe bricks covered with yellow plaster

Ash from burned cane

Layers of adobe in the base of the

Gravel

Adobe with mortar between

Mortar and plaster together

Sandy loam with different types of compaction

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Very loose matrix

Wall of adobe (Feature 23)
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Very loose matrix

Wall of adobe (Feature 23)
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Semi-compacted matrix

Compacted matrix

Loose ground

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Adobe wall (feature 23) with yellow paint on external surface
Small hole from looters

Semi-compact
Compact matrix
Loose Matrix
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Figure 5.2. Huaura Style vessels (modified after Vallejo 2010, Figure 5)

Figure 5.3. Huaura Style vessels (modified from Vallejo 2010, Figure 5) (modified after Vallejo 2010 Figure 5)
Figure 5.4 Huaura Style vessel (Modified after Vallejo 2010, Figure 6)

Figure 5.5. Huaura Style vessel (Modified after Vallejo 2010, Figure 6)
Figure 5.6. A selection of Huaura Style vessels studied by Cruzado Carranza (2008). Photographs by Cruzado Carranza.
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Figure 5.9. A selection of diagnostic sherds from the Sector A surface collection at Caldera.
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Figure 5.14. Huaura Impressed vessel from Caldera Sector A surface collection. The band around the upper body is a line of birds.
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Figure 5.16. Chancay black on white sherds from Caldera Sector A surface collection.

Figure 5.17. Kero and kero fragments from surface collection at Caldera, Sector A.
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Figure 5.21. Excavated sherds from Caldera, Sector A, Unit 2, Level 1.
Figure 5.22. Excavated pots from Caldera, Sector A, Unit 2, Level 11.

Figure 5.23. Excavated sherds from Caldera, Sector A, Unit 3, Level 5. Chancay Black on White is represented.
Figure 5.24. Sherds from Caldera, Sector A, Unit 3 excavation wall collapse.
Figure 5.25. Sherds from Caldera, Sector A, Unit 4, Level 1.
Figure 5.26. Diagnostic sherds from Caldera, Sector C, Unit 5, Level 1.
Figure 5.27. Sherds from Caldera, Unit 5a, Level 1. Huaura Impressed and Chancay Black on White are represented.
Figure 5.28. Sherds from Caldera, Sector C, Unit 5a, Level 2.
Figure 5.29. Sherds from Caldera, Sector C, Unit 5b, surface. These appear to be from the same vessel which is Huaura Style.

Figure 5.30. Warped sherd from Caldera, Sector C, Unit 5b, Level 1.
Figure 5.31. Sherds from Caldera, Sector C, Unit 5b, Level 2.
Figure 5.32. Sherds from Caldera, Sector C, Unit 5b, Level 3 (exterior and interior photographs side by side). The third pair of images appears to be Huaura Style.
Figure 5.33. Sherds from Caldera, Sector C, Unit 5b, Level 3 (exterior and interior photographs side by side). The third pair of images appears to be Huaura Style.
Figure 5.34. Close-up photo of applique, probably a frog, excavated in Caldera, Unit 6, Level 1.

Figure 5.35. Sherd from Caldera, Sector B, Unit 6, unit wall collapse.
Figure 5.36. Selection of forms represented in sherds from surface collections at El Carmen, Sector A.
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Figure 5.38. Flute fragments (top) and associated sherds (bottom) from surface collections at Sector A of El Carmen.
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Figure 5.43. Nearly whole pot from surface collection of El Carmen, Sector A.
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Figure 5.45. A selection of diagnostic sherds the surface collection at El Carmen, Sector B. Top left: fragment of one huge vessel, probably for storage. The rest of the sherds are Huaura style with the exceptions of the four sherds in the bottom left corner.
Figure 5.46. Close up photo of two Huaura Style sherds which depict designs that resemble stylized faces. These were found during surface collections at El Carmen, Sector B.
Figure 5.47. Drawings of some of the Huaura style sherds from surface collections from El Carmen, Sector B.
Figure 5.48. Additional diagnostic sherds from the surface collection at El Carmen, Sector B.
Figure 5.49. Sherds with applique found in surface collection at El Carmen, Sector B. The example on the left shows face, whereas the example on the left appears to depict a flexed figure.
Figure 5.50. Additional diagnostic sherds from surface collection at El Carmen, Sector B. This image has both mold made and incised.
Figure 5.51. Pottery with bird motifs from El Carmen surface collection in Sector B.

Figure 5.52. Bowls were among the forms represented in the material from the surface collection at El Carmen, Sector C.
Figure 5.53. Pottery from El Carmen surface collection in Sector C.

Figure 5.54. Huaura style pot from El Carmen surface collection in Sector D.
Figure 5.55. Diagnostic sherd from El Carmen, Unit 1, surface.

Figure 5.56. Diagnostic sherds from El Carmen, Unit 1, Level 1.
Figure 5.57. Sherds from El Carmen, Unit 1, Level 2.

Figure 5.58. Sherds from El Carmen, Unit 1, Level 3.
Figure 5.59. Sherds from El Carmen, Unit 1, Level 4.

Figure 5.60. Sherds from El Carmen, Unit 1, Level 5.
Figure 5.61. Diagnostic herds from El Carmen, Unit 2, Level 1.
Figure 5.62. Forms and designs represented among the sherds from El Carmen, Unit 2, Level 2.
Figure 5.63. Additional diagnostic sherds from El Carmen, Sector A, Unit 2, Level 2. These include Huaura style sherds on the second row with the middle and left sherds.
Figure 5.64. Diagnostic sherds from El Carmen, Sector A, Unit 2, Level 2. These include Huaura style.
Figure 5.65. Diagnostic sherds from excavation at El Carmen, Sector A, Unit 2, Level 2. (Note that the photo and drawing in the third row are not the same sherd.)
Figure 5.66. Diagnostic sherds from El Carmen, Sector A, Unit 2, Level 1. These may represent Huaura style keros.
Figure 5.67. Additional diagnostic sherds from El Carmen, Sector A, Unit 2, Level 1.

Figure 5.68. Bowl with Huaura Impressed style on the exterior and Chancay black on white on the interior. From El Carmen, Sector A, Unit 2, Level 2.
Figure 5.69. Kero fragments from El Carmen, Sector A, Unit 2, Level 2.

Figure 5.70. Fragments of a huge vessel from El Carmen, Unit 2, Level 2.
Figure 5.71. El Carmen, Sector A, Unit 2, Level 3 sherds.

Figure 5.72. Sherds from El Carmen, Unit 3, Level 2.
APPENDIX A: AMS Results from the Center for Applied Isotopic Studies

The University of Georgia
Center for Applied Isotopic Studies

RADIOCARBON ANALYSIS REPORT

Ashley Heaton
1216 1/2 Jefferson Avenue
New Orleans, LA 70115

Dear Mrs. Heaton

Enclosed please find the results of 14C Radiocarbon and Stable Isotope Ratio δ13C analyses for the samples received on October 27, 2011.

<table>
<thead>
<tr>
<th>UGAMS#</th>
<th>Sample ID</th>
<th>Material</th>
<th>δ13C,‰</th>
<th>14C age years BP</th>
<th>±</th>
<th>pMC</th>
<th>±</th>
</tr>
</thead>
<tbody>
<tr>
<td>9671</td>
<td>286</td>
<td>charcoal</td>
<td>-24.6</td>
<td>620</td>
<td>20</td>
<td>92.67</td>
<td>0.26</td>
</tr>
<tr>
<td>9672</td>
<td>632</td>
<td>seed</td>
<td>-22.7</td>
<td>610</td>
<td>20</td>
<td>92.63</td>
<td>0.26</td>
</tr>
<tr>
<td>9673</td>
<td>857</td>
<td>plant frag.</td>
<td>-23.7</td>
<td>620</td>
<td>20</td>
<td>92.61</td>
<td>0.26</td>
</tr>
<tr>
<td>9674</td>
<td>970</td>
<td>seeds</td>
<td>-23.3</td>
<td>710</td>
<td>25</td>
<td>91.5</td>
<td>0.27</td>
</tr>
<tr>
<td>9675</td>
<td>978</td>
<td>charcoal</td>
<td>-22.1</td>
<td>730</td>
<td>20</td>
<td>91.3</td>
<td>0.26</td>
</tr>
<tr>
<td>9676</td>
<td>890</td>
<td>wood</td>
<td>-25.1</td>
<td>200</td>
<td>20</td>
<td>87.81</td>
<td>0.27</td>
</tr>
<tr>
<td>9677</td>
<td>795</td>
<td>charcoal</td>
<td>-28.8</td>
<td>960</td>
<td>20</td>
<td>92.11</td>
<td>0.26</td>
</tr>
<tr>
<td>9678</td>
<td>1514</td>
<td>charcoal</td>
<td>-24.8</td>
<td>960</td>
<td>20</td>
<td>92.1</td>
<td>0.26</td>
</tr>
</tbody>
</table>

The plant fragment sample was treated with 5% HCl at the temperature 80°C for 1 hour, then it was washed with deionized water on the fiberglass filter and rinsed with diluted NaOH to remove possible contamination by humic acids. After that the sample was treated with diluted HCL again, washed with deionized water and dried at 60°C. For accelerator mass spectrometry analysis the cleaned charcoal was combusted at 900°C in evacuated / sealed ampoules in the presence of CuO.

The resulting carbon dioxide was cryogenically purified from the other reaction products and catalytically converted to graphite using the method of Vogel et al. (1984) Nuclear Instruments and Methods in Physics Research B5, 289-293. Graphite 14C/12C ratios were measured using the CAIS 0.5 MeV accelerator mass spectrometer. The sample ratios were compared to the ratio measured from the Oxalic Acid I (NBS SRM 9890). The sample 13C/12C ratios were measured separately using a stable isotope ratio mass spectrometer and expressed as δ13C with respect to PDB, with an error of less than 0.1‰. The quoted uncalibrated dates have been given in radiocarbon years before 1950 (years BP), using the 14 C half-life of 5568 years. The error is quoted as one standard deviation and reflects both statistical and experimental errors. The date has been corrected for isotope fractionation.

Sincerely,

Dr. Alexander Cherkinsky
APPENDIX B: Pottery Assemblage Analysis Guide used during Analysis of Pottery From Caldera and El Carmen

Ceramic Analysis for the Huaura Valley

Updated 30 June 2010

PROVENIENCE (Procedencia)

Sherd#: Individual number for every artifact in the pottery database (N1 to infinity) [larger than a quarter]. If too small, proceed to “Bulk Fragments” section on separate worksheet. Este número es desde 1 hasta infinito. Cada fragmento tiene un número único [si es de tamaño suficiente]. Si es demasiado pequeño, pasa a la parte de “Fragmentos al por mayor”.

Site/Sitio: Name of the site. Use abbreviations -- Rontoy (Ron), Chambara (Cham), Quípico (Qui)

Sector: Sector of site. If no sector is listed, use n/a.

Unit/Unidad: The unit (pit, trench, or surface). E.g. Pozo 1, U2, Superficie, etc.

Level/Nivel o Feature/Rasgo: The level or feature. Use N# or R#. If multiple layers are listed, put them all in this single entry. If surface, put ‘S’.


GENERAL CHARACTERISTICS (Características generales)

EstPeriod: Estimated time period. Estimación del periodo.
0=not known/no conocido
1=Initial Period/Periodo Inicial
2=Early Horizon/Horizonte Temprano
3=Early Intermediate Period/Periodo Intermedio Temprano
4=Middle Horizon/Horizonte Medio
5=Late Intermediate Period/Periodo Intermedio Tardío
6=Late Horizon/Horizonte Tardío
7=Colonial
8=Late (MH to Colonial)

ProcTerm: Parochial (Common designation) term for vessel type/style. Designación común del tipo y/o estilo de la vasija.
1= Early Horizon bright/strong red
2= Early Horizon reddish brown wares
3= Neckless pot/olla sin cuello
4= Burnished pattern unknown/association/Patrón bruñido
   4.1=linear burnishing (LIP)
   4.2=multidirectional burnishing (EH)
5= White on red
6= Huaura style/Estilo Huaura
7= Huaura Impressed
8= Chancay Polychrome
9= Cayash
10= Chancay black on white/Chancay negro sobre blanco
11= Chancay yellow (w/o black designs) (LIP)
12= Chancay-Inca
13=Middle Horizon polychrome (black & White on red)
14=Black on red
15=White on orange
16=combination of Middle Horizon polychrome and Huaura Impressed
17=combination of Chancay Yellow and Huaura Impressed
18=
99=Indeterminate
**VesPart:** Location of the sherd on the vessel. Ubicación del fragmento en la vasija.

<table>
<thead>
<tr>
<th>VesPart</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent</td>
</tr>
<tr>
<td>1</td>
<td>Whole Vessel</td>
</tr>
<tr>
<td>2</td>
<td>Rim/borde</td>
</tr>
<tr>
<td>3</td>
<td>Body/cuerpo</td>
</tr>
<tr>
<td>4</td>
<td>Base/base</td>
</tr>
<tr>
<td>5</td>
<td>Handle/asa</td>
</tr>
<tr>
<td>6</td>
<td>Rim and body</td>
</tr>
<tr>
<td>7</td>
<td>Body and base</td>
</tr>
<tr>
<td>8</td>
<td>Rim, body, and base</td>
</tr>
<tr>
<td>9</td>
<td>Rim and handle</td>
</tr>
<tr>
<td>10</td>
<td>Rim and handle</td>
</tr>
<tr>
<td>11</td>
<td>Body and handle</td>
</tr>
<tr>
<td>12</td>
<td>Rim, handle, and body</td>
</tr>
<tr>
<td>13</td>
<td>Handle, body, and base</td>
</tr>
<tr>
<td>14</td>
<td>Rim, handle, body, and base</td>
</tr>
<tr>
<td>15</td>
<td>Neck and body</td>
</tr>
<tr>
<td>16</td>
<td>Rim and neck</td>
</tr>
<tr>
<td>17</td>
<td>Rim, neck, and body</td>
</tr>
<tr>
<td>18</td>
<td>Neck</td>
</tr>
<tr>
<td>19</td>
<td>Neck, handle, and body</td>
</tr>
<tr>
<td>20</td>
<td>Neck, handle, and rim</td>
</tr>
<tr>
<td>99</td>
<td>Indeterminate</td>
</tr>
</tbody>
</table>

**Length:** Measurement of the maximum length perpendicular to the rim in mm, first orienting the fragment. Medida del largo máximo perpendicular al borde, en mm. Hay que orientar el fragmento primero.

**Width:** Measurement of the maximum width parallel to the rim in mm. Medida del ancho máximo paralelo al borde, en mm/cm.

**Thickness:** Measurement of the thickness of the wall of the sherd/vessel. Rims should be measured below any thickening at the lip. Medida del grosor del pared de fragmento/vasija. Las medidas de bordes deben ser tomados abajo cualquier grosor del labio.

<table>
<thead>
<tr>
<th>VesPart</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>not measurable, eroded/no se puede medir, erosionado</td>
</tr>
</tbody>
</table>

**Weight:** Weight of the sherd in grams

**RimDia:** Rim diameter measurement in mm. If sherd is not a rim fragment, then put 0. If the sherd fragment is too small to get a reading on, then put “I” for indeterminate. Medida del diametro del borde, en mm.

**RimPer:** Approximate percentage of rim (round to lowest %5)

**FormDet:** Details of form. To be elaborated. Detalle de la forma. Para elaborar en el proceso del análisis.

<table>
<thead>
<tr>
<th>FormDet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unidentified flatware</td>
</tr>
<tr>
<td>2</td>
<td>Unidentified hollowware</td>
</tr>
<tr>
<td>3</td>
<td>Plate/plato</td>
</tr>
<tr>
<td>3.1</td>
<td>Convex-sided plate</td>
</tr>
<tr>
<td>3.2</td>
<td>Straight-sided plate</td>
</tr>
<tr>
<td>3.3</td>
<td>Angle-sided plate</td>
</tr>
<tr>
<td>3.4</td>
<td>Flaring (concave-sided) plate</td>
</tr>
<tr>
<td>4</td>
<td>Dish</td>
</tr>
<tr>
<td>4.1</td>
<td>Convex-sided dish</td>
</tr>
<tr>
<td>4.2</td>
<td>Straight-sided dish</td>
</tr>
<tr>
<td>4.3</td>
<td>Angle-sided dish</td>
</tr>
<tr>
<td>4.4</td>
<td>Flaring (concave-sided) dish</td>
</tr>
</tbody>
</table>
5= Bowl/cuenco
5.1= Convex-sided bowl
  5.2= Straight-sided bowl
  5.3= Angle-sided bowl (do you mean shoulder?)
  5.4= Flaring (concave-sided) bowl
  5.5= Flaring (concave) walled bowl with ring base
  5.6= Rounded ring-based bowl

6= Olla
  6.1= Spherical (globular) olla
  6.2= Vertical ellipsoid (oblong) olla
  6.3= Horizontal ellipsoid olla

7= Jar/jarra
  7.1= Spherical (globular) jar
  7.2= Vertical ellipsoid (oblong) jar
  7.3= Horizontal ellipsoid jar
  7.4= Top-heavy ovaloid jar

7.5= Bottom-heavy ovaloid jar
7.6= Bubblenecked jar
7.62= Double-level bubblenecked jar
  7.63= Triple-level bubblenecked jar

7.7= Short-necked jar
  7.71= Short-necked jar, possible goblet

8= Canteen/Cántaro
8.1= Convex-walled canteen
8.2= Straight-walled canteen

9= Vase
9.4= Top-heavy ovaloid vase
9.5= Bottom-heavy ovaloid vase

10= Kero
10.2= Straight-sided kero
  10.4= Flaring (concave-sided) kero

11= Goblet
12= Gigantes
13= Figurine
  13.1= Solid figurine
  13.2= Hollow figurine

14= Flute (antara)
99= Indeterminate
LipShp: Shape of lip/rim edge (if present).
0=Lip absent on this sherd
1=Rounded
2=Squared
3=Angled towards interior (olla)
4=Angled towards exterior
5=Lipped
6=Long-lipped
7=Domed
8=Lipped and angled towards the interior (#3 & #5; olla or bubble necked jar)
9=Pinched
10=See drawing
11=See drawing
12=See drawing
13=
14=
15=
16=
17=
18=
19=
20=
99=Indeterminate

RimPart: Part of rim present.
0=Rm absent on this sherd
1=General rim
2=Only neck
3=Only collar
4=Rim and neck
5=Rim and collar
6=Rim, neck, and body
7=Rim and body
8=
99=Indeterminate

ColShp: Shape of collar (if present).
0=Collar absent on this sherd
1=Rounded
2=Squared
3=Angular
4=Tongued
5=Not cayash, with an angle to the exterior
6=Not cayash, with an angle to the interior
7=Lipped
8=Double-bump
9=Enlongated
10=
11=
12=
13=
14=
99=Indeterminate
NeckShp: Shape of neck (if present).
0=Neck absent on this sherd
1=Rounded
2=Straight/flat
3=Angled inwards
4=Angled outwards
5=see picture: flaring then bubble
6=
99=Indeterminate

NeckL: Length of neck measured in mm (measured from the lip to the point of inflection on the inside of the vessel)
0=Neck absent on this sherd
I=(capital letter “i”) When the sherd does not have the vessel’s point of inflection

BaseShp: Shape of base (if present).
0=Base absent on this sherd
1=Rounded
2=Squared/flat
3=Angular
4=Ring-based
5=Stemmed
6=Flat with open/angled outward sides
7=Tripod or with feet
8=
9=
99=Indeterminate
**HndlType:** Type of handle (if present).
0=Handle absent on this sherd
1=Rectangular and flat
2=Twisted like rope
3=Hourglass
4=Rounded
5=
6=
99=Indeterminate

**HndlLoc:** Location of handles (if present).
0=Handle absent on this sherd
1=Rim to ...(unidentified area)
  1.1= All rim
  1.2= to neck
  1.3= to collar
  1.4= to shoulder (upper body)
  1.5= to lower body
  1.6= to general body
2=Neck to ...(unidentified area)
  2.2= All neck
  2.4= to shoulder (upper body)
  2.5= to lower body
  2.6= to general body
3=Collar to ...(unidentified area)
  3.3= All collar
  3.4= to shoulder (upper body)
  3.5= to lower body
  3.6= to general body
4=Shoulder to ...(unidentified area)
  4.4= All shoulder (upper body)
  4.5= to lower body
5=Lower body to ...(unidentified area)
  5.5= All lower body
6=General body to ...(unidentified area)
  6.6= General body to general body
99=Indeterminate

**Constr:** Construction method. Método de construcción.
1=Slab
2=Coil/padded/hecho de rollos y golpeada ligeramente
3=paddle and anvil/paleteada
4=Mold/hecho por molde
99=Indeterminate

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**PstColor**: Color of overall paste of clay used in vessel.

1 = red/reddish brown
2 = orange
3 = yellow
4 = cream/buff
5 = tan/lt brown
6 = brown
7 = gray
8 = black
9 = strong red (not brown at all!)
99 = indeterminate

**CoreColor**: Color of core of vessel versus surfaces of vessel as seen in cross-section (not considering any applied pigments to surface of vessel).

1 = All paste color
2 = 1/2 by interior darker (gray), 1/2 by exterior paste
3 = 1/2 by interior paste, 1/2 by exterior darker (gray)
4 = Inner core darker (gray), outer edges paste
5 = Inner core paste, outer edges darker (gray)
6 = All gray (or almost)
7 = Mixed (shows multiples of above on different parts of the cross-section, on one sherd)
8 = 1/2 by interior pinkish, 1/2 by exterior paste
9 = 1/2 by interior paste, 1/2 by exterior pinkish
10 = inner core pinkish, outer edges paste
11 = inner core paste, outer edges pinkish
12 = part by interior gray, core is paste, part by exterior pink
13 = all pinkish (or almost)
14 = 1/2 by interior gray, 1/2 by exterior pink, little/no paste
15 = 1/2 by interior pink, 1/2 by exterior gray, little/no paste
16 = part by interior pink, core is gray, part by exterior paste
17 = part by interior paste, core is pink, part by exterior gray
18 = part by interior gray, core is pink, part by exterior paste
19 = part by interior pink, core is paste, part by exterior gray
99 = Indeterminate
Temper: Type of temper used.
1=Rock
   1.1=Fine angular rock (0-2 mm on average)
   1.2=Coarse angular rock (2-4 mm on average)
   1.3=Large angular rock (temper is over 4 mm dia each on avg)
2=Rock and sherd
   2.1 Fine angular rock (0-2 mm on average) and sherd
   2.2=Coarse angular rock (2-4 mm on average) and sherd
   2.3=Large angular rock (> 4 mm dia each on avg) and sherd
3=Sherd only
   3.1=Fine sherd (0-2 mm on average)
   3.2=Coarse sherd (2-4 mm on average)
   3.3=Large sherd (>over 4 mm dia each on avg)
4=Rock (granitic) and shell
   4.1 Fine angular rock (0-2 mm on average) and shell
   4.2=Coarse angular rock (2-4 mm on average) and shell
   4.3=Large angular rock (temper is over 4 mm dia each on avg) and shell
5=Calcite/limestone and sherd
   5.1=Fine calcite/limestone (0-2 mm on average) and sherd
   5.2=Coarse calcite/limestone (2-4 mm on average) and sherd
   5.3=Large calcite/limestone (temper is over 4mm diameter each on average) and sherd
6=Calcite/limestone and rock
   6.1
   6.2
   6.3
7=Organic
   7.1
   7.2
   7.3
8=Organic and rock
   8.1
   8.2
   8.3
99=Indeterminate

Firing: Firing mishaps. Alteración por fallas de cocción.
0=Unidentified/no determinado
1=Fireclouds/manchas por cocción
2=Bloating/hinchado
3=Sintering/sinterización
4=Warped
5=Coccion reductora
6=Coccion oxidente
7=Fireclouds and coccion reductora
8=Uncooked
9=Fireclouds and coccion oxidente
99=Indeterminate

Vitrify: Absence or presence of vitrified substance on sherd (almost always on vessels with paint). Ausencia o presencia de sustancia vitrificada en el fragmento.
0=Vitrification absent on this sherd
1=Present
99=Indeterminate
**Soot (Ollín):** Absence or presence of soot on sherd. Ausencia o presencia de ollín en el fragmento.
0= Soot absent on this sherd
1=Present
2=Post-depositional
3=post-depositional and use-derived soot
99=Indeterminate

**ExtColor (and IntColor):** Exterior color is the predominant color of the exterior surface of the vessel. Refer to range categories in appendix. El color exterior es el color predominante de la superficie exterior de la vasija. Ver rango de las categorías en el apéndice.
1=Red/reddish brown
2=Orange
3=Yellow
4=Cream/buff
5=Tan/lt brown
6=Brown
7=Gray
8=Black
9=Same as paste
10=pink
99=Indeterminate

**ExtSurf (and IntSurf):** Exterior surface treatment. Tratamiento de la superficie exterior.
0=Absent
1=Scraped/raspado
2=Smoothed unslipped/alisado sin engobe
3=Smoothed slipped/alisado con engobe
3.1=Slipped in only one part (i.e. drips from edge, or intentionally partially slipped)
4=Polished/pulido
5=Burnished/bruñido
5.1=burnished in one part/area
6=Slipped in one part, burnished on another part
7=wiped, but not smoothed or slipped (it is rougher than smoothed, but not as rough as scraped – no lines from scraping)
8=smoothed and slipped with different clay (only use if surface slip is obviously different and added)
8.1=smoothed and slipped with a different clay in only one part
9=2 colors of slip and burnished
10=Slipped and burnished
10.1=Burnished all over, slipped on top but only part
11=Two different colors of slip
12=Burnished in 1 part plus 2 colors of slip
99=Indeterminate

**ColorCom:** Color combination including both paint color(s) and slip/surface treatment color. Note: B=Black, R=Red/reddish brown, W=White/cream/yellow, O=Orange, T=Tan, P=Purple, and “/”="on slip", so “B & R / O” means Black and Red/reddish brown paint on Orange slip)
*note: there is no 2.10, 3.10, 3.20, or 3.30 because Excel would change them to 2.1, etc.

1=No paint (can be slipped or unslipped)

2=Monochrome paint
2.1=B / W
2.2=B / R
2.3=B / O
2.4=R / W
2.5=O / W
2.6=O / R
2.7=W / B
2.8=W / R
2.9=W / O
2.10*
2.11=W / Y
2.12=B / T
2.13=O / T
2.14=W / T
2.15=R / T
2.16=R / O?
2.17=P / R
2.18=P / O
2.19=P / T
2.20*
2.21=R / W
2.22=P / W
3=Polychrome (in which W can be White, Yellow, Cream, and Light Tan)

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4=Indeterminate (when you don’t know what is slip and what is paint)

DecType: Decoration type (dominant scheme). Tipo de decoración

0=Absent

1=Incised/Inciso

2=Impressed/Impreso

3=Painted/Pintado

4=Molded/Moldeado

5=Incised and Impressed/Inciso y impreso

6=Incised and Painted/Inciso y pintado

7=Impressed and Painted/Impreso y pintado

8=Patterned Burnishing/Patrón bruñido

9=Impressed and applique

10=Applique only

11=Painted and molded

12=Applique and painted

99=Indeterminate
**ExtDecType (and IntDecType):** Decoration type located on the exterior surface of the vessel. Tipo de decoración ubicado en la superficie exterior/interior de la vasija.

- 0=Absent
- 1=Incised/Inciso
- 2=Impressed/Impreso
- 3=Painted/Pintado
- 4=Molded/Moldeado
- 5=Incised and Impressed/Inciso y impreso
- 6=Incised and Painted/Inciso y pintado
- 7=Impressed and Painted/Impreso y pintado
- 8=Patterned Burnishing/Patrón bruñido
- 9=Impressed and applique
- 10=Applique only
- 11=Painted and molded
- 12=Applique and painted
- 13=Molded and Incised
- 14=Incised and Applique
- 15=Applique and paint and incised
- 99=Indeterminate

**ExtIncised (and IntIncised):** Location of Exterior (or Interior) Incising. Ubicación del inciso exterior/interior.

- 0=Absent
- 1=Whole Vessel
- 2=Rim/borde
- 3=Body/cuerpo
- 4=Base/base
- 5=Handle/asa
- 6=Rim and body
- 7=Body and base
- 8=Rim, body, and base
- 9=Rim and handle
- 10=Rim and handle
- 11=Body and handle
- 12=Rim, handle, and body
- 13=Handle, body, and base
- 14=Rim, handle, body, and base
- 15=Neck and body
- 16=Neck and neck
- 17=Rim, neck, and body
- 18=Neck
- 19=Neck, handle, and body
- 20=Neck, handle, and rim
- 99=Indeterminate

**EIType (and IIType):** Type of Exterior (or Interior) Incising.

- 0=Absent
- 1=Fine incising (skinny lines, v-shaped in profile)
- 2=Groove incising
- 3=Combing (done with a multi-toothed tool)
- 4=Excising (cut out sections)
- 5=Shallow incising (aka groove incising) (broad, shallow lines, rounder in profile)
- 6=Indeterminate

**EIPattern (and IIPattern):** Exterior (or Interior) Incised Pattern. Patrón de incision exterior/interior.

- 0=Absent
- 1=Circle/círculo
- 2=Circle and Dot (dot is impressed but part of the same motif)/círculo y punto (punto está impreso pero parte del mismo diseño).
- 3=Line/Línea
- 4=Xs
- 5=Crosshatching
- 6=Circle and lines
- 7=Zoomorphic (ex. Bird wing)
- 8=
- 9=
- 99=Indeterminate
**EIPatOrg (and IIPatOrg):** Exterior (or Interior) Incised Pattern organization on vessel part.

0=Absent
1=Grouped/clustered
2=Linear
3=Arranged in multiple rows
4=Arranged in multiple columns
5=Unpatterned
6=
7=
8=
99=Indeterminate

**EITime (and IITime):** When the incising occurred on vessel.

0=Absent
1=Preslip
2=Postslip
3=Postfire
99=Indeterminate

**ExtImp (and IntImp):** Location of Exterior Impressed. Ubicación del impression exterior.

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<td>Whole Vessel</td>
</tr>
<tr>
<td>2</td>
<td>Rim/borde</td>
</tr>
<tr>
<td>3</td>
<td>Body/cuerpo</td>
</tr>
<tr>
<td>4</td>
<td>Base/base</td>
</tr>
<tr>
<td>5</td>
<td>Handle/asa</td>
</tr>
<tr>
<td>6</td>
<td>Rim and body</td>
</tr>
<tr>
<td>7</td>
<td>Body and base</td>
</tr>
<tr>
<td>8</td>
<td>Rim, body, and base</td>
</tr>
<tr>
<td>9</td>
<td>Rim and handle</td>
</tr>
<tr>
<td>10</td>
<td>Rim and handle</td>
</tr>
<tr>
<td>11</td>
<td>Body and handle</td>
</tr>
<tr>
<td>12</td>
<td>Rim, handle, and body</td>
</tr>
<tr>
<td>13</td>
<td>Handle, body, and base</td>
</tr>
<tr>
<td>14</td>
<td>Rim, handle, body, and base</td>
</tr>
<tr>
<td>15</td>
<td>Neck and body</td>
</tr>
<tr>
<td>16</td>
<td>Rim and neck</td>
</tr>
<tr>
<td>17</td>
<td>Rim, neck, and body</td>
</tr>
<tr>
<td>18</td>
<td>Neck</td>
</tr>
<tr>
<td>19</td>
<td>Neck, handle, and body</td>
</tr>
<tr>
<td>20</td>
<td>Neck, handle, and rim</td>
</tr>
<tr>
<td>21</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>Indeterminate</td>
</tr>
</tbody>
</table>

**EMType (and IMType):** Type of impressions.

0=Absent
1=Simple impressing
2=Stamping
3=Rocker stamping
4=Punctation
5=Simple impressing and punctation
99=Indeterminate
**EMPattern (and IMPattern):** Pattern of impressions on the exterior (or interior) of the vessel. Patrón de las impresiones en la parte exterior/interior de la vasija.

0=Absent
1=Circle/círculo
2=Circle and Dot (dot is impressed but part of the same motif)/círculo y punto (punto está impreso pero parte del mismo diseño)
3=Line/línea
4=Wide shallow lines
5=Points
6=Circle and dots, with half-circles too
7=Long shallow rectangles
8=No discernible pattern
9=
10=
11=
99=Indeterminate

**EMPatOrg (and IMPatOrg):** Pattern of impressions on the exterior (or interior) of the vessel (codified as we go). Patrón de las impresiones en la parte exterior/interior de la vasija (codificado durante el proceso del análisis).

0=Absent
1=Grouped/clustered
2=Linear
3=Arranged in multiple rows
4=Arranged in multiple columns
5=No discernible pattern
6=
7=
8=
99=Indeterminate

**EMTool (and IMTool):** Type of tool/implement likely used for impressions.

0=Unknown/no determinado
1=Reed
2=Corncob
3=Textile
4=Mat
5=Shell
6=Stick/something pointy?
7=Reed and stick
8=
99=Indeterminate

**ExtMold (and IntMold):** Location of Exterior mold made design. Ubicación del diseño hecho por molde en la parte exterior.

0=Absent
1=Whole Vessel
2=Rim/borde
3=Body/cuerpo
4=Base/base
5=Handle/asa
6=Rim and body
7=Body and base
8=Rim, body, and base
9=Rim and handle
10=Rim and handle
11=Body and handle
12=Rim, handle, and body
13=Handle, body, and base
14=Rim, handle, body, and base
15=Neck and body
EMoldType (and IMoldType): Type of exterior mold-made design.
0=Absent
1=Ovals/bean shaped (raised dots) (measured at largest/longest dot)
   1.1=small ovals (0-5mm)
   1.2=medium ovals (5-10mm)
   1.3=large ovals (10mm or larger)
2=Face
   2.1=face and body
3=Birds
4=Undulating curves (some sort of calabaza? zapallo?)
5=Raised ovals (measured at largest/longest dot) and and lines
   5.1=small ovals (0-5mm) and lines
   5.2=medium ovals (5-10mm) and lines
   5.3=large ovals (10mm or larger) and lines
6=Line(s)
7=Bird and lines
8=Lines and circles alternating
9=Lines and dots
10=
11=
99=Indeterminate
**ExtPaint (and IntPaint):** Location of paint on the exterior of the vessel. Ubicación de la pintura en la parte exterior de la vasija.

- 0=Absent
- 1=Whole Vessel
- 2=Rim/borde
- 3=Body/cuerpo
- 4=Base/base
- 5=Handle/asa
- 6=Rim and body
- 7=Body and base
- 8=Rim, body, and base
- 9=Rim and handle
- 10=Rim and handle
- 11=Body and handle
- 12=Rim, handle, and body
- 13=Handle, body, and base
- 14=Rim, handle, body, and base
- 15=Neck and body
- 16=Rim and neck
- 17=Rim, neck, and body
- 18=Neck
- 19=Neck, handle, and body
- 20=Neck, handle, and rim
- 21=
- 99=Indeterminate

**EPBinder (and IPBinder):** Can you see a binder (indicated usually by sloppy red streaks where paint [usually black] has not remained)? Note: most things with paint (unless red) will be indeterminate. If there is no paint, then “0”

- 0= No
- 1=Yes
- 2= Absent
- 3= Only binder remaining, no actual paint present
- 99= Indeterminate

**EPVitrif (and IPVitrif):** If the paint (usually black) has vitrified.

- 0= Absent
- 1=Present
- 2=Absent
- 99=Indeterminate

**EPPattern (and IPPattern):** Type of pattern created by paint (motif). To be elaborated as analysis proceeds. Tipo de patron de la pintura (motivo). Elaboramos durante el proceso del análisis.

- 0=Absent
- 1=Dots and ticks
- 2=Lines
- 3=Checkerboard
- 4=Hatching
- 5=Cross-hatching
- 6=Lines (parallel) and dots
- 7=Alternating rows of zig-zags and straight lines
- 8=Large V
- 9=Lines and crosshatching
- 10=Curving lines and dots
- 11=Straight and curving lines, with ovals
- 12=Parallel lines with wave curl
- 13=No discernible pattern
- 14=Solid (surface covered with paint)
- 15=Curvy concentric lines
- 16=Rectangle
- 17=line (or drippy line) around rim
- 18=bird feet
- 18.1=bird feet with lines
- 19=“Nintendo face” see drawing
- 20=birds
- 21=circles (almost like mimicking impressions)
- 22=see drawing
- 23=see drawing
- 24=see drawing
- 25=paint only on applique
- 26=see drawing
- 27=see drawing
- 28=curving lines and face, see drawing
- 12345=detailed drawing, see drawing & photo
- 99=Indeterminate
**ExtAppliq (and IntAppliq):** Location of applique on the exterior of the vessel. Ubicación del aplicación en la parte exterior de la vasija.

0=Absent
1=Whole Vessel
2=Rim/borde
3=Body/cuerpo
4=Base/base
5=Handle/asa
6=Rim and body
7=Body and base
8=Rim, body, and base
9=Rim and handle
10=Rim and handle
11=Body and handle

12=Rim, handle, and body
13=Handle, body, and base
14=Rim, handle, body, and base
15=Neck and body
16=Rim and neck
17=Rim, neck, and body
18=Neck
19=Neck, handle, and body
20=Neck, handle, and rim
21=
22=
99=Indeterminate

“and circles and lines”

27. curving lines and “face”
   (example on interior rim)

28.

12345=detailed pattern, see drawing/photo
**EAPattern**: Form of the appliqué. Forma de la aplicación.

0 = Absent
1 = Coffee bean/“grano de café”
2 = Monkey/mono
3 = Frog/sapo
4 = Anthropomorphic/antropomorfo
5 = Dog, fox, jaguar/perro, zorro, jaguar
6 = Pyramid/cone/pinch – could be an ear, could be a nose, could be a fake handle, could be a random nubbin
7 = Circle and dot (raised dot inside raised circle)
8 = Cross
9 = Peanut shell
99 = Indeterminate

7 = Circle and dot. Ex raised dot inside raised circle

8 = Cross

9 = Peanut shell

**Use Wear** (evidence of wear due to actual use)

0 = Absent
1 = Spalling (slip [or self-slip] layer popped off—usually due to heat during or after firing)
2 = Pitting (small pock marks due to direct impact of a small point)
3 = Sooting (black soot present—make sure it is not post-depositional, check broken edges, etc.)
4 = Scratching (lengthwise marks from sharp object)
5 = Post breakage working (smoothed or reshaped edges)
6 = Black residue on interior
7 = Heat discoloration (usually darker red to brown patches)
8 = Radial spalling
9 = Uneven wear on surface
10 = Residue on interior
11 =
12 =
13 =
99 = Indeterminate
**Location of Use Wear**

0=Absent  
1=Exterior entire  
3=Exterior rim  
4=Interior on rim  
5=Interior and exterior  
6=Lip and point of inflection  
7=Exterior near base  
8=Interior body  
9=Exterior body  
10=Exterior base  
11=Edge of sherd (cross section)  
12=Exterior body and handle  
13=Exterior body and handle and interior  
14=Handle  
15=  
16=  
99=indeterminate

**Photo:** photo # for sherd

**Comments (Comentarios):** Any additional information. Información adicional.
Appendix I (Apéndice I). Bulk Fragments. Fragmentos al por mayor.
Sherds that are very small (less than a quarter/un nuevo sol, ≤ approx. 2.5 cm max dimension) will not be analyzed individually, but will be done in group. Follow the instructions below.

Divide all small sherds into 2 groups – fine and coarse.

Site/Sitio: Name of the site. Use abbreviations -- Rontoy (Ron), Chambara (Cham), Quipico (Qui)

Unit/Unidad: The unit (pit, trench, or surface). E.g. Pozo 1, Trincher 2, Superficie, etc.

Level/Nivel o Feature/Rasgo: The level or feature. Use N# or R#. If multiple layers are listed, put them all in this single entry. If surface, put ‘S’.


Count: Total number of fragments in the group.

Weight: Total weight of fragments in the group (in g).
Appendix II (Apéndice II). Key to Color Groups (Using Munsell Designations). Guía de grupos de color (según designaciones Munsell).

1=RED/REDDISH BROWN
   10R 5/2, 5/3, 5/4, 4/2, 4/3, 4/4, 4/6, 4/8, 3/1, 3/2, 3/3, 3/4, 3/6, 2.5/1, 2.5/2
   2.5YR 4/2, 4/3, 4/4, 3/2, 3/3, 3/4, 3/6, 2.5/1, 2.5/2, 2.5/3, 2.5/4
   5YR 4/2, 4/3, 4/4, 4/6, 3/2, 3/3, 3/4, 2.5/1, 2.5/2

2=ORANGE
   10R 7/6, 7/8, 6/6, 6/8, 5/6, 5/8
   2.5 YR 7/6, 7/8, 6/6, 6/8, 5/6, 5/8, 4/6, 4/8
   5YR 8/4, 7/4, 7/6, 7/8, 6/6, 6/8, 5/6, 5/8
   7.5 YR 8/6, 7/6, 7/8, 6/6, 6/8, 5/6, 5/8

3= YELLOW
   10YR 8/4, 8/6, 8/8, 7/4, 7/6, 7/8, 6/6, 6/8, 5/6, 5/8
   2.5 Y 8/4, 8/6, 8/8, 7/4, 7/6, 7/8, 6/6, 6/8, 5/6
   5Y 8/3, 8/4, 8/6, 8/8, 7/3, 7/4, 7/6, 7/8, 6/4, 6/6, 6/8, 5/4, 5/6

4=CREAM/ BUFF
    GLEY 1 8/2, 7/2
    7.5YR 8/2, 8/3, 8/4, 7/1
    10YR 8/1, 8/2, 8/3, 7/1
    2.5 Y 8/1, 8/2, 8/3, 7/1
    5Y 8/1, 8/2, 7/1, 7/2

5=TAN/LIGHT BROWN
    GLEY 1 6/2, 5/2
    5YR 6/2, 6/3, 5/2, 5/3, 5/4
    7.5YR 7/2, 7/3, 7/4, 6/2, 6/3, 6/4, 5/2, 5/3, 5/4, 5/6
    10YR 7/2, 7/3, 6/2, 6/3, 6/4, 5/2, 5/3, 5/4, 5/6
    2.5 Y 7/2, 7/3, 6/2, 6/3, 6/4, 5/2, 5/3, 5/4
    5Y 6/2, 6/3, 5/2, 5/3

6=BROWN
    7.5 YR 4/2, 4/3, 4/4, 4/6, 3/2, 3/3, 3/4, 2.5/2, 2.5/3
    10YR 4/2, 4/3, 4/4, 4/6, 3/2, 3/3, 3/4, 3/6, 2/2
    2.5 Y 4/2, 4/3, 4/4, 3/2, 3/3
    5Y 4/2, 3/2, 2.5/2

7=GRAY
    GLEY 1 8/N, 7/N, 6/N, 5/N, 4/N, 3/N, 2.5/N
    GLEY 2 7/10B, 7/5PB, 6/10B, 6/5PB, 5/10B, 5/5PB, 4/10B, 4/5PB, 3/10B, 3/5PB
    10R 6/1, 5/1, 4/1
    2.5 YR 6/1, 5/1, 4/1, 3/1
    5YR 6/1, 5/1, 4/1, 3/1
    7.5 YR 6/1, 5/1, 4/1, 3/1
    10YR 6/1, 5/1, 4/1, 3/1
    2.5Y 6/1, 5/1, 4/1, 3/1, 2.5/1
    5Y 6/1, 5/1, 4/1, 3/1, 2.5/1

8=BLACK
GLEY 1 2.5/N
GLEY 2 2.5 all
10 YR 2/1
This report was produced by Luis R. Huamán Mesia who analysed a selection of floor samples from both El Carmen and Caldera. Data from the sites of Quipico, Chambara, and Rontoy are also included as the samples were submitted together.
Estimado Luis,

Encerré en el anexo 12 muestras para el análisis de polen y 6 muestras para la identificación de la especie. Soy interesado en el presente de identificación de la especie de polen para la comparación entre sitios y periódos. Caldera y El Carmen son contextos Horizontes Medio y Alteo, Romoy es del período Intermedio Tardío. Sería interesante ver si hay cambios con el comienzo del Chancay en el valle de Huaura al principio del difunto Intermedio Tardío. Hay también alguna discusión de una sequía durante el Horizonte Medio. Así, cambios en la especie de plan serían muy interesantes. Yo también soy interesado en una comparación de muestras de difunto Intermedio Tardío. Romoy es muy cerca de la costa, y el perfil botánico es diferente de eso de Quipúco y Chambra que son adicionales arriba el valle.

Furímetro por favor para saber si tiene cualquier pregunta. Aquí está una lista de las muestras y nosotros podemos arreglar pago a través de teléfono o correo electrónico. Espero ver los resultados a la suya propia, pero son interesantes a ver los resultados tan pronto como sea posible.

Sinceramente,

Kit
Analisis cuantitativo diferenciado por usos (se incluyen taxa silvestre . wild)
Analisis cuantitativo diferenciado por usos (se presentan taxa SOLO con uso determinado)
Analisis cualitativo (presencia) diferenciado por usos (se incluyen taxa silvestre. wild)
Analisis cualitativo diferenciado por usos (se presentan taxa SOLO con uso determinado)
APPENDIX D: Botanical Analysis for Caldera

This report was produced by Enrique Bellido Cerda who analysed the macrobotanical remains from Caldera.
Introducción
El presente informe da cuenta de los resultados del análisis del material botánico recuperado en el sitio La Caldera. Los datos obtenidos se presentarán bajo el siguiente esquema: información cualitativa, referida a los datos botánicos de las muestras analizadas, así también la información ecológica y etnobotánica, debe aclararse en rigor a la verdad que los datos en ese sentido son aproximados y referenciales, sin ahondar en detalles; luego, se presenta la información cuantitativa, referida básicamente a la distribución de la muestra según los contextos y unidades excavadas. Se aspira a que la información obtenida por el análisis, pueda ser referencia, en la medida que se trata de un pieza más del complejo rompecabezas que es el contexto arqueológico.

Como primera anotación podemos decir que la flora nos dibuja un escenario similar al actual, nos referimos a una zona agrícola, de modo que la flora identificada nos indica la existencia de canales, caminos, chacras, hábitats propios de la zona ecológica denominada chaupiyunga o valle medio, donde se ubica “La Caldera”. Por otra parte si bien la muestra no es abundante, se pude advertir que diferenciación de espacios, con evidencias de actividades de consumo, que aunque discretas indican que algunos cultivos (maíz) eran consumidos de modo mayoritario por la población.

Materiales y Métodos

Los materiales analizados consistieron en 343 especímenes botánicos contenidos en 29 bolsas, recuperados durante las excavaciones en el Sitio Arqueológico de La Caldera. Se pudo observar que la mayor parte de los materiales estaba, bien conservados, pudiendo diferenciarse los caracteres anatómicos necesarios para su determinación de la mayor parte de restos botánicos; asimismo, se pudo observar en los restos leñosos (tallos) la ausencia de insectos.
Para la determinación de las muestras, se hizo un estudio de anatomía comparada, de los caracteres macroscópicos de nuestra muestra con especímenes modernos, por lo que se recurrió a herbarios indexados online, información propia, así como a literatura botánica especializada.

Por otra parte, para el conteo de los restos se recurrió al uso del Numero Mínimo de Individuos (NMI), para las semillas y frutos, debido a que en muchos casos se puede observar que un fruto (o semilla) entero puede estar fragmentado en un contexto, y que al contar las partes diagnósticas de su estructura (hilum, puntos de inserción) se puede advertir dicha posibilidad.

**Resultados**

**ASPECTOS BOTÁNICOS DE LA MUESTRA**

Realizada la determinación taxonómica de la muestra, se pudo reconocer 18 taxa, distribuidas del modo siguiente: 13 taxa a nivel de especie, 17 a nivel género, las cuales están distribuidas en 10 familias.

Se puede observar que las familias mejor representadas son: FABACEAE (5n) y POACEAE (5n), así mismo la mayor parte de la diversidad de la muestra se encuentra dentro de la clase DICOTILEDONEAE o MAGNOLIOPSIDA (12n).

**TABLA Nº 1**

<table>
<thead>
<tr>
<th>CLASE</th>
<th>FAMILIA</th>
<th>GENERO</th>
<th>ESPECIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICOTILEDONEAE</td>
<td>ASTERACEAE</td>
<td>Baccharis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CANNACEAE</td>
<td>Canna</td>
<td>Indica</td>
</tr>
<tr>
<td></td>
<td>CUCURBITACEAE</td>
<td>Lagenaria</td>
<td>Siceraria</td>
</tr>
<tr>
<td></td>
<td>FABACEAE</td>
<td>Arachis</td>
<td>Hypogaea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canavalia</td>
<td>plagiosperma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Caesalpinea</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inga</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phaseolus</td>
<td>vulgaris</td>
</tr>
<tr>
<td></td>
<td>LAURACEAE</td>
<td>Persea</td>
<td>americana</td>
</tr>
<tr>
<td></td>
<td>MALVACEAE</td>
<td>Gossypium</td>
<td>barbadese</td>
</tr>
<tr>
<td></td>
<td>SALICACEAE</td>
<td>Salix</td>
<td>humboldtiana</td>
</tr>
<tr>
<td></td>
<td>SAPOTACEAE</td>
<td>Pouteria</td>
<td>lucuma</td>
</tr>
</tbody>
</table>
Por otra parte la muestra se caracteriza por presentar especies cuyo hábito (o forma de crecimiento) es mayormente hierbas, con una menor presencia de árboles y arbustos, tratándose de especies domesticadas y/o cultivadas.

En la siguiente tabla ampliamos la información referida a los hábitats donde se crecen las especies que hemos determinado.

**TABLA Nº 2**

<table>
<thead>
<tr>
<th>TAXA</th>
<th>NOMBRE VULGAR</th>
<th>BIOTOPOS*</th>
<th>HABITO</th>
<th>ALTITUD (msnm)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arachis hypogaea</td>
<td>&quot;Mani&quot;</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0-1200</td>
</tr>
<tr>
<td>Baccharis sp.</td>
<td>&quot;Chilca&quot;</td>
<td>Bosque ribereño, campos abandonados</td>
<td>Arbusto</td>
<td>0-500</td>
</tr>
<tr>
<td>Caesalpinea sp.</td>
<td>-</td>
<td>Marginal de campos de cultivo, acequias</td>
<td>Árbol</td>
<td>0-2000</td>
</tr>
<tr>
<td>Canavalia plagiosperma</td>
<td>&quot;Pallar de los gentiles&quot;</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0-1500</td>
</tr>
<tr>
<td>Canna indica</td>
<td>&quot;Achira&quot;</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0-2000</td>
</tr>
<tr>
<td>Cenchrus ecchinatus</td>
<td>&quot;Cadillo&quot;</td>
<td>Campos abandonados</td>
<td>Hierba</td>
<td>0-1200</td>
</tr>
<tr>
<td>Gossypium barbadense</td>
<td>&quot;Algodón&quot;</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0-1600</td>
</tr>
<tr>
<td>Gynerium sagittatum</td>
<td>&quot;Caña brava&quot;</td>
<td>Marginal de acequias, y ríos.</td>
<td>Caña</td>
<td>0-1200</td>
</tr>
<tr>
<td>Inga sp.</td>
<td>&quot;Pacae&quot;</td>
<td>Marginal de campos de cultivo, acequias</td>
<td>Árbol</td>
<td>0-2500</td>
</tr>
<tr>
<td>Lagenaria siceraria</td>
<td>&quot;Mate&quot;</td>
<td>Suelos húmedos. Campos de cultivo.</td>
<td>Hierba</td>
<td>0-2000</td>
</tr>
<tr>
<td>Paspalidium</td>
<td>&quot;grama&quot;</td>
<td>Campos abandonados</td>
<td>Hierba</td>
<td>0-500</td>
</tr>
<tr>
<td>Persea americana</td>
<td>&quot;Palta&quot;</td>
<td>Marginal de campos de cultivo, acequias</td>
<td>Árbol</td>
<td>0-2000</td>
</tr>
<tr>
<td>Phaseolus</td>
<td>&quot;Frejol&quot;</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0-2000</td>
</tr>
<tr>
<td><strong>vulgaris</strong></td>
<td>&quot;Carrizo&quot;</td>
<td>Marginal de acequias, y ríos.</td>
<td>Caña</td>
<td>0-1200</td>
</tr>
<tr>
<td><strong>Phragmites australis</strong></td>
<td></td>
<td>Suelos arenosos. Marginal de caminos, acequias y campos de cultivo.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pouteria lucuma</strong></td>
<td>“Lúcuma”</td>
<td>Marginal de campos de cultivo, acequias</td>
<td>Árbol</td>
<td>0-3000</td>
</tr>
<tr>
<td><strong>Salix humboltiana</strong></td>
<td>&quot;Sauce&quot;</td>
<td>Marginal de campos de cultivo, acequias</td>
<td>Árbol</td>
<td>0-1200</td>
</tr>
<tr>
<td><strong>Zea mays</strong></td>
<td>“maíz”</td>
<td>Campos de cultivo (suelos húmedos o medianamente húmedos).</td>
<td>Hierba</td>
<td>0-3600</td>
</tr>
</tbody>
</table>

*Información referencial

A partir de la información contenida en la tabla Nº 2, se puede observar que las especies determinadas se restringen altitudinalmente a los 1800mnsnm aproximadamente, y con una presencia mayoritaria de especies domesticadas y/o cultivadas, lo cual resulta ser un paisaje muy similar a los valles costeños de hoy; observamos por ejemplo, especies (5n) que crecen en espacios de cultivos ("chacras") y por otra parte especies (4n) asociadas a estos espacios, se puede reconstruir todo los hábitats del valle agrícola (chacras, canales, río, cañaverales, y caminos).

**USOS**

Gracias a que existe un amplio registro de crónicas, y etnográficos actuales, podemos aproximarnos con buen grado de certeza a los usos de las especies que han podido determinarse. De modo que al agrupar nuestra muestra por usos podemos observar una composición distinta, y bastante sugerente, como se aprecia en el Cuadro Nº 1, la mayor parte de nuestra muestra son especies comestibles, específicamente frutas (5n) y semillas comestibles (5n), debemos señalar que la mayor parte de los frutales tienen la cualidad de ser también maderables, es decir poseer buena madera, tanto para construcción como para leña, siendo estos los usos más destacados, se observan también fibras, y especies aprovechables como recipientes, y que al observar restos de hollín o muestras carbonizadas es muy probable que se haya usado algunas como combustible.
Finalmente, nuestra lista de usos nos sugiere actividades que se realizar diferentes actividades domésticas, relacionadas con la preparación y/o consumo de alimentos, dentro de las cuales se incluyeron actividades a una escala reducida de construcción (o reparación) de algún tipo, y textileria.

<table>
<thead>
<tr>
<th><strong>ALIMENTICIAS</strong></th>
<th><strong>CONDIMENTOS</strong></th>
<th><strong>FRUTOS COMESTIBLES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GRANOS Y SEMILLAS</strong></td>
<td><strong>Capsicum sp. (“aji”)</strong></td>
<td><strong>Inga sp. (“paca”)</strong></td>
</tr>
<tr>
<td><em>Arachis hypogaea</em> (“maní”)</td>
<td></td>
<td><strong>Persea americana (“palta”)</strong></td>
</tr>
<tr>
<td><em>Phaseolus vulgaris</em> (“frijol”)</td>
<td></td>
<td><strong>Pouteria lucuma</strong> (“lúcuma”)</td>
</tr>
<tr>
<td><em>Zea mays</em> (“maíz”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Canavalia plagiosperma</em> (“Pallar de los gentiles”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RAÍCES Y TALLOS</strong></td>
<td><strong>Canna indica (“achira”)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CONDIMENTOS</strong></td>
<td><strong>RAÍCES Y TALLOS</strong></td>
<td><strong>FRUTOS COMESTIBLES</strong></td>
</tr>
<tr>
<td><strong>CONDIMENTOS</strong></td>
<td><strong>Canna indica (“achira”)</strong></td>
<td><strong>Inga sp. (“paca”)</strong></td>
</tr>
<tr>
<td><strong>ALIMENTICIAS</strong></td>
<td><strong>RAÍCES Y TALLOS</strong></td>
<td><strong>Persea americana (“palta”)</strong></td>
</tr>
<tr>
<td><strong>ALIMENTICIAS</strong></td>
<td><strong>RAÍCES Y TALLOS</strong></td>
<td><strong>Pouteria lucuma</strong> (“lúcuma”)</td>
</tr>
<tr>
<td><strong>OTROS</strong></td>
<td><strong>RECIPIENTES</strong></td>
<td><strong>USADOS PARA CONSTRUCCIÓN</strong></td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td><strong>Phragmites australis</strong> (“carrizo”)</td>
</tr>
<tr>
<td><em>Inga sp. (“paca”)”</em></td>
<td></td>
<td><strong>Gynerium sagittatum</strong> (“caña brava”)</td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td>*<em>Baccharis sp. (“Chilca”)”</em></td>
</tr>
<tr>
<td><em>Pouteria lucuma</em> (“lúcuma”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td></td>
</tr>
<tr>
<td><em>Psidium guajava</em> (guayaba”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td></td>
</tr>
<tr>
<td><em>Salix humboldtiana</em> (“aliso”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td></td>
</tr>
<tr>
<td>*Caesalpinea sp. (“tara?”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td></td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td></td>
</tr>
<tr>
<td><strong>MADERA</strong></td>
<td><strong>Lagenaria siceraria</strong> (“mate”)</td>
<td></td>
</tr>
<tr>
<td><strong>FIBRAS</strong></td>
<td><strong>Gossypium barbadense</strong> (“algodón”)</td>
<td></td>
</tr>
</tbody>
</table>
La distribución (por contextos) de los datos recuperados en nuestro análisis están contenidos en la tabla N° 3, además de las sumatorias correspondientes se agregó, en porcentaje el ratio de presencia- ausencia, para saber cuan fuerte era la presencia de...
determinadas especies, en nuestro universo de datos, o también cuanta diversidad se reportaba en cada contexto sea del nivel que fuere.

Se observa en principio una mayor diversidad y abundancia de material en el Sector C, pese a que la evidencia proviene de una sola unidad, que si bien ampliada, contiene tres veces más material que 3 unidades abiertas en el Sector A, cabría sin embargo preguntarse si se trata de un evento restringido al contexto descubierto, por lo que excavaciones en otras áreas aclararían este punto. Podemos observar también la presencia constante de pacae, (*Inga sp.*), algodón (*Gossypium barbadense*) y maíz (*Zea mays*), que al parecer son las especies principales en cuanto a consumo y son representativas de los espacios cercanos a los contextos excavados, refiriéndonos a la posibilidad de que la evidencia del pacae (*Inga sp.*), por ejemplo haya sido depositado por el viento.

Valdría la pena hacer algunas observaciones sobre la unidad 5 (y sus ampliaciones 5A, 5B y 5Amp), ya que es la unidad con mayor cantidad de evidencia, y también la que contiene mayor diversidad (89% del total de la muestra analizada), haciendo la precisión que se trata de una abundancia relativa, ya que en sí el numero de restos por capa es reducido. Con respecto a las evidencias analizadas empezamos por observar la presencia constante de pacae, (*Inga sp.*), algodón (*Gossypium barbadense*), maíz (*Zea mays*), lo cual nos sugiere la utilización y producción de estas especies, que como habíamos indicado en otro lugar de este informe son especies mayormente alimenticias (con excepción del algodón).

**discusión y comentarios finales**

En principio señalábamos la poca cantidad de evidencia botánica en el sitio de La Caldera, que resultó similar al sitio de El Carmen. La estratigrafía por su parte, se muestra homogénea, por lo que no pareciera que existiera algún tipo de evento que nos indique que haya algún tipo de conservación diferenciada. Tanto la posibilidad de abandono progresivo, como eventos de consumo esporádicos, o aún limpieza durante los periodos de ocupación en el sitio, nos parece posibles.
Los datos resulta ser más contundentes al indicar que el ambiente representado es el valle medio costeño, con una clara economía agrícola siendo los productos principales el maíz, algodón, mate, y algunas variedades de frejoles, valdría mencionar que actualmente se siembra maíz y frejoles de forma rotativa, para evitar el desgaste de la tierra, ya que las FABACEAE (eso incluye el pacae) inyectan nitrógeno a la tierra, lo cual ayuda a incrementar su fertilidad; además debemos señalar que muchos (arboles) frutales se siembran de forma paralela a acequias y caminos, y que en algunos casos se aprovechan algunos como sombra para algunos cultivos (como es el caso también del pacae).

Debemos observar entonces, que la mayor parte de los productos cultivados son alimenticios, y una menor cantidad de productos usados para otros fines, de los cuales son ejemplos notorios la presencia de algodón (Gossypium barbadense) y mate (Lagenaria siceraria), relacionados al procesamiento de fibra o actividad textil y el segundo muy usado como recipiente. Esta idea se ve reforzada, al observar en la Tabla Nº 3 que las estructuras (partes de la planta) recuperadas de los diferentes contextos, coinciden en su mayoría con dichas actividades (semillas y frutos).

Resulta notorio que existen diferencias entre sectores, de modo que la evidencia indica actividades de consumo de alimentos de forma más intensiva en el Sector C, mientras que la evidencia del Sector A es reducida y la diversidad es también menor indicando no solo un menor movimiento sino actividades de otra naturaleza, por lo que la evidencia de especies comestibles (que es mínima) puede explicarse como eventos aislados.

Por otra parte, resulta interesante como ejercicio reconstruir a partir de la información disponible, una pirámide alimenticia (Gráfico Nº 1), y observar a través lo referente al manejo de alimentos. Podemos observar por un lado, que la variedad de plantas disponibles permite completar el componente vegetal de una dieta (análisis arqueozoológicos puede completar la información referida a la ingesta de carnes), sin embargo los diferentes contextos no muestran que agrupaciones de una dieta completa, sino solo elementos parciales, sin embargo resulta claro que el maíz termina siendo la especie más consumido, lo cual parece ser ya una suerte de habito alimenticio. Debemos señalar que lo más probable sea que la variedad de especies disponibles sea mucho mayor, y que su ausencia en estos contextos se explica por las actividades desarrolladas
en su interior, sin embargo debe llamar la atención que la disponibilidad existente permite indicar que la población de La Caldera poseía los recursos suficientes para su sostenimiento.

**GRAFICO Nº 1**

**Bibliografía**


UGENT, Donald y OCHOA, Carlos (2006) LA ETNOBOTÁNICA DEL PERÚ. DESDE LA PREHISTORIA AL PRESENTE. Lima - Perú. CONCYTEC.

Tusa de "maíz" (Zea mays)

Semilla de "maíz" (Zea mays)

Semilla de *Caesalpinea* sp.

Tumores en tallos de "pacae" (*Inga* sp.)
APPENDIX E: Botanical Analysis for El Carmen

This report was produced by Enrique Bellido Cerda who analysed the macrobotanical remains from El Carmen.
Introducción

El presente informe expone los resultados del análisis del material arqueobotánico del sitio arqueológico El Carmen.

La secuencia de este informe será la siguiente: primero, se detallaran las características de la muestra analizada, la metodología y criterios manejados; segundo, presentaremos los resultados en tablas y gráficos señalando los datos más relevantes, a nuestra consideración; y, finalmente se comentaran y discutirán los resultados del análisis.

Un primer aspecto característico de este estudio es la cantidad reducida de material analizado que en comparación materiales recuperados de sitios del valle de Huaura (más tardíos) es menor. Un segundo aspecto es la ubicación temporal del material, el periodo Horizonte Medio, del que existen pocos análisis arqueobotánicos realizados.

En ese sentido este análisis se convierte en una herramienta para realizar un primer acercamiento hacia cual habría sido la gestión de los recursos florísticos, durante el Horizonte Medio. En líneas generales podemos decir que el material arqueobotánico analizado del sitio arqueológico “El Carmen” nos muestra una preferencia en el consumo o manejo de plantas alimenticias, así como un constante manejo de arboles.

Materiales y Métodos

Se analizaron unos 926 especímenes botánicos distribuidos en 13 bolsas. La evidencia botánica consistió en tallos, raíces, flores, tallos, frutos y semillas.

Los materiales estaban en términos generales bien conservados, se podían diferenciar los caracteres taxonómicos necesarios para su determinación, en los restos leñosos no se observaron presencia de insectos, tampoco se observó que los materiales estuvieran sufriendo un proceso de mineralización.

La determinación de las muestras fue realizada a través de la anatomía comparada de caracteres macroscópicos, se recurrió a bases de datos y a literatura botánica especializada.
Resultados

A continuación se presentan los resultados del análisis primero se expondrán los resultados a nivel botánico, luego se detallan los aspectos relacionados a la ecología y etnobotánica de los mismos, finalmente se harán las asociaciones contextuales de los mismos.

ASPECTOS BOTÁNICOS DE LA MUESTRA

La determinación de las muestras de como resultado que la muestra se compone de 13 taxa, de las cuales están 9 se han podido determinar hasta el nivel especie, 11 a nivel género, y distribuidas en 10 familias.

Las familias mejor representadas son las de las FABACEAE (3n) y CUCURBITACEAE (2n), así mismo la mayor parte de la muestra se compone de especies de la clase DICOTILEDONEAE o MAGNOLIOPSIDA (10n)

<table>
<thead>
<tr>
<th>CLASE</th>
<th>FAMILIA</th>
<th>GENERO</th>
<th>ESPECIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICOTILEDONEAE</td>
<td>ASTERACEAE</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>CACTACEAE</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>CUCURBITACEAE</td>
<td>Cucurbita</td>
<td>ficifolia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lagenaria</td>
<td>siceraria</td>
</tr>
<tr>
<td></td>
<td>FABACEAE</td>
<td>Arachis</td>
<td>hypogaea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inga</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phaseolus</td>
<td>Vulgaris</td>
</tr>
<tr>
<td></td>
<td>LAURACEAE</td>
<td>Persea</td>
<td>americana</td>
</tr>
<tr>
<td></td>
<td>MALVACEAE</td>
<td>Gossypium</td>
<td>barbadese</td>
</tr>
<tr>
<td></td>
<td>SAPOTACEAE</td>
<td>Pouteria</td>
<td>lucuma</td>
</tr>
<tr>
<td></td>
<td>POACEAE</td>
<td>Zea</td>
<td>mays</td>
</tr>
<tr>
<td></td>
<td>BROMELIACEAE</td>
<td>Tillandsia</td>
<td>sp.</td>
</tr>
</tbody>
</table>

Otra de las características del material analizado es que mayormente son hierbas domesticadas con una menor presencia de árboles y arbustos silvestres o semi-silvestres.
Los datos los resumimos en la siguiente tabla

<table>
<thead>
<tr>
<th>TAXA</th>
<th>NOMBRE VULGAR</th>
<th>BIOTOPOS</th>
<th>HABITO</th>
<th>ALTITUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CACTACEAE</td>
<td>“Cactus”</td>
<td>Laderas y planicies de cerros</td>
<td>Cactus</td>
<td>0 - 450msnm</td>
</tr>
<tr>
<td>Lagenaria siceraria</td>
<td>“Mate”</td>
<td>Suelos húmedos. Campos de cultivo.</td>
<td>Hierba - Enredadera</td>
<td>2000msnm</td>
</tr>
<tr>
<td>Arachis hypogaea</td>
<td>“Maní”</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0 - 1200msnm</td>
</tr>
<tr>
<td>Inga sp.</td>
<td>“Pacae”</td>
<td>Marginal de campos de cultivo, acequias</td>
<td>Árbol</td>
<td>0 - 2500msnm</td>
</tr>
<tr>
<td>Phaseolus vulgaris</td>
<td>“Frejol”</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0 - 2000msnm</td>
</tr>
<tr>
<td>Persea americana</td>
<td>“Palta”</td>
<td>Marginal de campos de cultivo, acequias</td>
<td>Árbol</td>
<td>0 - 2000msnm</td>
</tr>
<tr>
<td>Gossypium barbadense</td>
<td>“Algodón”</td>
<td>Campos de cultivo.</td>
<td>Hierba</td>
<td>0 - 1600msnm</td>
</tr>
<tr>
<td>Pouteria lúcuma</td>
<td>“Lúcuma”</td>
<td>Suelos arenosos. Marginal de caminos, acequias y campos de cultivo.</td>
<td>Árbol</td>
<td>0 - 3000msnm</td>
</tr>
</tbody>
</table>

ECOLOGÍA

En la siguiente tabla se resumen los resultados respecto a la ecología relacionada con la muestra analizada.
Como puede observarse en la tabla hay la mayor parte de las especies nos remiten a biotopos o hábitats similares. Y es que la mayor parte de la muestra (4n) son especies cultivadas, con las respectivas especies asociadas al mismo espacio ecológico como son las que crecen en áreas marginales a los caminos, campos de cultivos y acequias (3n) y una pequeña cantidad de especies que crece asociada a espacios secos, rocosos, arenosos, como lo son las laderas y planicies de los cerros (2n). Todos estos biotopos encajan en el área geográfica del valle bajo-medio costeño; pese a las amplias distribuciones altitudinales de varias de las especies determinadas (que oscilan de 0 a 3500msnm, p.e. *Tillandsia sp.*) lo más probable es que todas pertenezcan dentro del área de valle bajo-medio.
USOS

<table>
<thead>
<tr>
<th>Textil</th>
<th>Recipiente</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gossypium barbadense</td>
<td>f</td>
</tr>
<tr>
<td>Lagenaria siceraria</td>
<td>f</td>
</tr>
</tbody>
</table>

Un aspecto importante de la muestra analizada es la referida a los usos que estas representan. En la siguiente tabla señalamos dichos usos.

Como puede observarse la mayor parte de las especies presentes en nuestra muestra son comestibles (6n), aunque también hay que señalar que una especie posee varios usos como sucede con las especies *Inga sp.* (“pacae”) y *Persea americana* (“palta”) que además de ser muy conocidos por ser comestibles también son aprovechables para madera y leña (entre otros usos que son más difíciles de ser rastreados arqueológicamente).

Los usos de textil (algodón) y recipiente (mate) son representados por solo una especie cada uno.

Finalmente a algunas taxa (*Tillandsia, CACTACEAE*) no se les puede asociar a algún uso específico debido a que su nivel de determinación no nos lo permite.
En esta parte presentaremos los datos cuantitativos del análisis, según sea su contexto de procedencia, detallando las características del dato (según su estructura y su taxa).

A continuación presentamos la tabla con los datos en general.

<table>
<thead>
<tr>
<th>Taxa</th>
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<th>3</th>
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<th>Total1</th>
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<td>6</td>
<td>709</td>
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</tr>
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<tr>
<td>Total general</td>
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<td>162</td>
<td>14</td>
<td>34</td>
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<td>66</td>
<td>29</td>
<td>8</td>
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</table>

Los primeros datos que se leen a partir de esta tabla son: que las taxa mejor representadas son DICOTILEDONEAE, Gossypium barbadense, Zea mays, Inga sp., y Arachis hypogaeae.

Por otro lado el sector A contiene la mayor parte de la taxa, siendo la unidad 1, en su nivel 3 la que registra mayor cantidad de evidencia botánica.
Pero es en el nivel 2 de la unidad 2, donde se reporta una mayor diversidad de taxa.

Más adelante se comentará la relevancia de estos datos.

En la siguiente tabla presentaremos los resultados de forma más detallada:

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>A</th>
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<th>Total general</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIDAD</td>
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<tr>
<td>NIVEL</td>
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<td>FLOR</td>
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</tr>
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</tr>
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<td>cf. Sapium saponaria</td>
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</tr>
<tr>
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<tr>
<td>Inga sp.</td>
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<td>Lagarostrocytum</td>
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<td>Pouteria lucuma</td>
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<td>Tallo</td>
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<tr>
<td>cf. Poaceae</td>
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<tr>
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<td>Zea mays</td>
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</tr>
<tr>
<td>Total general</td>
<td>139</td>
<td>162</td>
<td>12</td>
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</tbody>
</table>
Comentarios

Lo primero que nos parece importante señalar es que la variedad de especies determinadas crecen en el espacio geográfico del valle medio y bajo, ninguna de ellas puede crecer en zonas frías o al menos crecen con mayores dificultades. En ese sentido creemos que existe una tendencia a basar la producción agrícola, y por ende el consumo en productos del área inmediata al sitio. En tal caso, no hemos encontrado evidencia de productos de zonas altas.

Resulta evidente que la producción agrícola estuvo centrada en productos comestibles, esto por la variedad presente, al mismo tiempo el aprovechamiento de especies como el algodón, parece ser de importancia, porque encontramos evidencia de algodón (semillas y flores) en la mayoría de los contextos, como bien podría ser el uso textil, y por ejemplo el rasgo 40, contiene solo semillas de algodón, lo cual nos lleva a preguntarnos si se trataría del manejo extendido de fibra de algodón.

Con respecto al tema del consumo nos preocupaba observar no solo que plantas estuvieron disponibles, sino cual sería su importancia con respecto a la dieta; por ello dentro de nuestros resultados nos pareció importante la construcción de una pirámide alimenticia, en base a una dieta recomendada por la OMS actualmente, de hecho es casi imposible que la dieta andina prehispánica se ajuste a estos criterios, sin embargo debido a que el organismo humano tiene sus propias exigencias en cuanto a carbohidratos, proteínas, y minerales, resulta posible hacer cierta comparación; por lo que construimos una pirámide alimenticia con los datos que poseíamos, lo cual dio como resultado que los alimentos disponibles, eran suficientes para una alimentación adecuada, claro que además habría que agregar el consumo de moluscos, peces, mamíferos, o aves, que habrían sido parte de la dieta cotidiana, y que faltaría evaluar cual sería la preferencia e intensidad de consumo; por cierto que la dieta del peruano promedio, contiene una gran cantidad de carbohidratos (arroz, papa o maíz) y un consumo de proteínas (carne) muy bajo.

Una clasificación en un poco libre y en términos de alimentación, de las especies determinadas podría ser la siguiente:
Sin embargo y en ese sentido, pese a que existía la disponibilidad para una dieta balanceada, los datos que observamos es que la preferencia en el consumo era de maní, seguido por el consumo de maíz. Siendo los datos más consistentes en el sector A, específicamente en la unidad 1, donde como remarcamos existe una preferencia en el consumo de maíz, y maní

Faltaría desarrollar cual habría sido el sistema agrícola para la producción de estas especies, ya que, si como sostiene Rostorowski (1977, 1978, 1989), se trata de señoríos interdependientes, debería corresponder, entonces una producción de una diversidad importante dentro de su territorio, salvo que haya existido una sistema que haya
permitido un intercambio continuo de la sobreproducción a fin de complementar y abastecerse de los productos que se consideraban necesarios.

Todas las especies reconocidas en el análisis son del valle medio, es decir que crecen sin ningún problema en el valle medio (también en el valle bajo), siendo que además el valle medio, es una excelente zona de producción agrícola, por la disponibilidad de agua, temperatura y tierras fértiles. Lo más probable es que el paisaje no haya cambiado sustancialmente.

A la vez esta variedad de especies aún se pueden encontrar en el paisaje moderno, aunque con una importancia mayor de cultivos introducidos. Sin embargo parece ser que no ha habido cambios sustantivos en el valle medio.

Un tema importante es la producción y consumo de maíz, y aunque el maní es la especie mejor representada en el sitio en cuanto a cantidad, existe una mayor diversidad de restos de maíz (tallos, raíz, frutos y semillas), el maíz registrado en el Carmen presenta las siguientes características:

- 12 a 14 filas, y
- tusa o mazorca de forma cónico-cilíndrica,

Lamentablemente no se reportaron tusas completas ni granos por lo que no podemos hacer una aproximación consistente sobre que variedad de maíz podría haber sido consumida en El Carmen; un detalle observado en algunas tusas es que tenían rastros de quema, lo cual sugiere que ocasionalmente se habrían usado como combustible, lo que no sería raro, ya que es bastante común y aún ahora que se use las tusas de maíz que por ser leñosas, sirven como combustible para encender o alimentar una fogata.

Ahora bien con respecto a la actividad del manejo de plantas, observamos que esta resulta casi nula en el sector B, en este sector la evidencia procede básicamente del nivel 1 de la unidad 3, y aun cuando la evidencia puede sugerir cierta actividad de consumo o manipulación de alimentos, sería prudente observar el resto de los elementos arqueológicos, ya que al ser el nivel más superficial no pareciera sino estar expuesto a
contaminación o ser una etapa de abandono; más bien la evidencia del Sector A es la que resulta más abundante, lo cual está influenciada por la ubicación de la unidad, particularmente la unidad 1 ubicada en un acceso, lo cual resulta importante ya que la abundancia de material botánico, parece indicar un tránsito de alimentos.

Un problema con respecto a la abundancia de tallos dentro de la muestra analizada, es que sufre de dos situaciones: por un lado nuestro conteo no los considera con un número mínimo de individuos (cuyas dimensiones en promedio son: 2cm de diámetro y 10cm de largo) como si podría medir frutos, flores o semillas; y por otra parte su génesis o formación no es bien conocida, ya podría tratarse desde restos de leña, pequeños desprendimientos del techo del recinto, o haber tenido un uso relevante; sin embargo nos resulta claro, que lo más probable es que se traten de especies frutales, que son bastante abundantes en el valle medio.

Ya haciendo una lectura final la evidencia botánica nos sugiere que la flora representada en los contextos estudiados es de procedencia local (valle medio), y cuya producción esta centrada primeramente en la producción de alimentos, pero también en algunas de uso industrial o textil como el algodón; particularmente en la unidad 1, se hace evidente no solo que hubo actividad de consumo o manipulación de alimentos, sino que además hubo algún tipo de circulación entre recintos; el hecho que haya diferencias entre el sector A y B con respecto a cantidad de evidencia podría sugerir diferentes actividades, sin embargo esto debe apoyarse en excavaciones más amplias.
Semilla de “Calabaza”

*(Cucurbita ficifolia)*

Espinas de “cactus” (CACTACEAE)

Semillas de “algodón” (*Gossypium barbadense*)
Izquierda: Semilla de “Calabaza”  
(Cucurbita cf. moschata)

Derechas: Semilla de “zapallo”  
(Cucurbita maxima)

Fruto de “lúcuma”  
(Pouteria lucuma)
Tusa de “maíz” (*Zea mays*)

Semilla de “mate” (*Lagenaria siceraria*)
Fruto o legumbre de “mani”  
(*Arachis hypogaea*)

Fruto o legumbre de “paca”  (*Inga cf. feullei*)
APPENDIX F: Shell Analysis

Carol Rojas Vega analysed the shell from specific contexts at Caldera and El Carmen, and this is her final report.
El presente informe es el resultado del análisis de material malacológico extraído durante la temporada de excavación 2009, del Proyecto de Investigación Arqueológica en el valle de Huaura, costa nor-central y Proyecto de Investigación de Culturas Antiguas.

Este análisis nos proporcionan datos sobre la diversidad de especies encontradas y utilizadas por el antiguo poblador de los sitios: El Carmen y Caldera; el acceso al recurso malacológico y los biotopos en los que se desarrollaron.

Esta información complementará la investigación realizada anteriormente para los sitios: Chambara, Quipico, Rontoy y Centinela del mismo proyecto (temporada 2007).

MÉTODO DE ANÁLISIS


La cuantificación, para una mejor comprensión de los datos, se contó el número mínimo de individuos NMI y el número de fragmentos por especie, de cada uno de los contextos excavados. Se consideraron los fragmentos debido a que la muestra en su mayoría, está conformada por estos.

TAXONOMÍA

En la muestra se identificaron:

Tres clases de moluscos: polyplacophora, gastrópoda y pelecypoda. Dentro de estas tres clases, se identificaron 13 familias y 17 especies.

Una clase de artrópodo: crustácea. Se identificó una familia.

CLASE POLYPLACOPHORA

FAMILIA CHITONIDAE. En esta familia tenemos una especie identificada: chiton sp. Su nombre común es “chitón”.

CLASE GASTROPODA
FAMILIA FISSURELLIDAE. Se identificó una especie: *fissurella sp.* Comúnmente denominada “lapa” y “keyhole limpet”.

FAMILIA ACMAEIDAE. Se identificó una sola especie: *scurria parasítica* denominada “patela” y “limpet”.

FAMILIA CALYTRAЕIDAE. Sólo una especie identificada: *crepipatella dilatata* su nombre común es “pique” y “cup and saucer limpet”.

FAMILIA NATICIDAE. Con una sola especie: *polinices uber* conocida comúnmente como “caracol blanco” y “moon snail”.

FAMILIA THAIDIDAE. Se identificaron cuatro especies: *thais chocolate* denominada comúnmente “caracol gris” y “dye shell” y *thais sp.*

FAMILIA NASSARIDAE. Solamente una especie: *nassarius gayi* conocida comúnmente como “caracolito” y “dog whelk”.

SUBCLASE PULMONATA

FAMILIA BULIMULIDAE. En esta familia se identificó una especie: *scutalus sp.* conocido como “caracol de tierra” y “land snail”.

CLASE BIVALVIA

FAMILIA MYTILIDAE. En esta familia se identificaron cuatro especies: *aulacomya ater* denominada comúnmente “choro” y “cholga mussel”, *choromytilus chorus* siendo su nombre común “choro zapato” y “mussel”, *perumytilus purpuratus* conocido como “choro playero” y “purple mussel”; y *semimytilus algosus* denominado “chorito” y “mussel”.

FAMILIA PECTINIDAE. Sólo se identificó una especie en esta familia: *argopecten sp.* Conocida comúnmente como “concha de abanico” y “scallop”.

FAMILIA DONACIDAE. Se identificó una especie: *donax sp.* Siendo su nombre común “palabritas” y “donax”.

FAMILIA MESODESMATIDAE. Se identificó una sola especie en esta familia: *mesodesma donacium* conocida como “almeja amarilla” y “widge clam”.

FAMILIA PHOLADIDAE. Solamente se identificó una especie: *pholas chiloensis*. Denominada “alas de ángel” y “piddocks”.

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CLASE CRUSTACEA

FAMILIA XANTHIDAE. Sólo se identificó la familia y es conocido comúnmente como “cangrejo” y “crab”.

BIOTOPO.

Las especies identificadas en los sitios: El Carmen y Caldera. Se han desarrollado en cuatro tipos de biotopo: rocoso, arenoso, vegetación de lomas y madera; como se presenta en las siguientes tablas:

<table>
<thead>
<tr>
<th>BIOTOPO ROCOSO</th>
<th>Supralitoral</th>
<th>Mesolitoral</th>
<th>Infralitoral</th>
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</thead>
<tbody>
<tr>
<td><strong>Especie</strong></td>
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<tr>
<td><em>Chiton sp.</em></td>
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<td><em>Fissurella sp.</em></td>
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<tr>
<td><em>Scurria parasitica</em></td>
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<tr>
<td><em>Thais chocolata</em></td>
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<tr>
<td><em>Thais sp.</em></td>
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<tr>
<td><em>Nassarius gayi</em></td>
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<td><em>Aulacomya ater</em></td>
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<tr>
<td><em>Perumytilus purpuratus</em></td>
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</tr>
<tr>
<td><em>Semimytilus algosus</em></td>
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### BIOTOPO ARENOSO

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<tbody>
<tr>
<td>Polinices uber</td>
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<tr>
<td>Argopeten sp.</td>
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<tr>
<td>Donax sp.</td>
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<tr>
<td>Mesodesma donacium</td>
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### OTROS BIOTOPOS

<table>
<thead>
<tr>
<th>Especie</th>
<th>OTROS BIOTOPOS</th>
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</thead>
<tbody>
<tr>
<td>Scutalus sp.</td>
<td>Vegetación de lomas</td>
</tr>
<tr>
<td>Pholas chiloensis</td>
<td>Madera</td>
</tr>
</tbody>
</table>

### INTERPRETACIÓN DE DATOS SEGÚN CONTEXTOS

Se debe señalar, que la muestra en su mayoría estaba compuesta por fragmentos de restos malacológicos. Por lo que, para una mejor comprensión de los datos se realizaron dos tipos de cuadros: uno para restos malacológicos completos y otro para fragmentos. Así tenemos:

### EL CARMEN

En este sitio se identificaron, 3 especies de la clase gastrópoda, 2 de la clase pelecypoda y una de la clase crustácea.

### Moluscos (NMI):

En el análisis de la muestra, se identificaron 18 elementos de las clases: GASTRÓPODA Y PELECYPODA.

En la clase GASTRÓPODA, la especie más representativa es: Scutalus sp., con 11 individuos que equivale al 61,11% del total de la muestra (Cuadro 1); estos fueron recuperados de: sector A, unidad 2, niveles superficial, 1, 2 y 3.
En la clase PELECYPODA, la especie con mayor número de elementos es *perumytilus purpuratus* con 4 individuos identificados que equivale al 22,22% del total de la muestra (Cuadro 1); estos fueron recuperados de: sector A, unidad y nivel 2.

**Moluscos fragmentos:**

Se identificaron 384 fragmentos de las clases: GASTRÓPODA Y PELECYPODA.

En la clase GASTRÓPODA, destaca las especies: *scutalus sp.* con 139 fragmentos que equivalen al 36,2% del total de la muestra (Cuadro 2); estos fragmentos han sido recuperados en su mayoría (de mayor a menor cantidad) del sector A, unidad 2, nivel 3 y del sector B, unidad 3, nivel 4. Seguida de la especie *thais sp.* con 03 fragmentos que representa el 0,78% de la muestra total (Cuadro 2); estos fragmentos han sido recuperados del sector A, unidad y nivel 2.

La clase PELECYPODA, destacan 4 especies: *mesodesma donacium* con 101 fragmentos identificados que representa el 26,3% del total de la muestra (Cuadro 2); estos fragmentos han sido recuperados en su mayoría de las siguientes áreas de excavación: sector A, unidad y nivel 1; y unidad y nivel 2. Le sigue la especie *aulacomya ater* con 58 fragmentos identificados que equivale al 15,1% de la muestra total (Cuadro 2); estos fragmentos han sido recuperados en su mayoría del sector A, unidad 2, nivel 2. Seguida de la especie *choromytilus chorus* con 43 fragmentos identificados que equivale al 11,2% del total de la muestra (Cuadro 2); estos fragmentos han sido recuperados en su mayoría de las siguientes áreas de excavación: sector A, unidad 2, niveles 2 y 3. Finalmente, los pelecípodos no identificados con 26 fragmentos que representa el 6,77% del total de la muestra (Cuadro 2); estos fragmentos han sido recuperados en su mayoría del sector A, unidad 2, nivel 3.

**Crustáceos:**

En el análisis de la muestra, se identificaron 8 fragmentos de la clase: CRUSTÁCEA.

En la clase CRUSTÁCEA, destaca la familia *Xanthidae* con 8 fragmentos identificados que equivalen al 100% del total de la muestra (Cuadro 3); estos fragmentos han sido recuperados en mayor cantidad (de mayor a menor cantidad) del sector B, unidad 3, niveles 1 y 2; y del sector A, unidad 2, niveles 1 y 3.

**CALDERA**

En este sitio se identificaron, una especie de la clase polyplacophora, 4 de la clase gastrópoda y 2 de la clase pelecypoda.
Moluscos NMI:

En el análisis de la muestra, se identificaron 11 elementos de las clases: POLYPLACOPHORA, GASTRÓPODA Y PELECYPODA.

De la clase POLYPLACOPHORA, tenemos dos individuos identificados de la especie chiton sp., que representa el 18,18% del total de la muestra (Cuadro 4). Este fue recuperado del sector A, unidad 4, nivel 1.

En cuanto a la clase GASTRÓPODA, se registró un total de 6 individuos, lo que representa el 54,55% del total de la muestra (Cuadro 4). Destacan las especies scurria parasitica y crepipatella dilatata., con 2 elementos identificados cada una; que equivale al 18,18% del total de la muestra (Cuadro 4); estos han sido recuperados del sector C, unidad 5a, nivel superficial y la ampliación de la unidad 5b (scurria parasitica) y del sector A, unidad 1, nivel 1 y unidad 4, nivel 1 (crepipatella dilatata).

En la clase PELECYPODA, se registró un total de 3 individuos que representa el 27,27% del total de la muestra (Cuadro 4). Destaca la especie permytilus purpuratus con 02 elementos que equivale al 18,18% del total de la muestra (Cuadro 4); estos han sido recuperados del sector A, unidad 4, nivel 1 y del sector C, unidad 5a, nivel superficial.

Moluscos fragmentos:

Se identificaron 587 fragmentos de las clases: GASTRÓPODA Y PELECYPODA.

En cuanto a la clase GASTRÓPODA, se identificaron un total de 14 fragmentos, lo que representan el 2,39% del total de la muestra (Cuadro 5). Destaca la especie scutalus sp., con 12 fragmentos que equivale al 2,04% del total de la muestra (Cuadro 5); estos fragmentos han sido recuperados en su mayoría del sector C, unidad 5b, niveles 2, 3 y 4.

En la clase PELECYPODA, se recuperó un total de 567 fragmentos identificados, lo que representa el 96,59% del total de la muestra (Cuadro 5). Destacando las especies: mesodesma donacium con 490 fragmentos que equivale al 83,48% del total de la muestra (Cuadro 5); estos fragmentos en su mayoría han sido recuperados (de mayor a menor cantidad) de las siguientes áreas de excavación: sector C, unidad 5b, niveles 3, 4, 2 y de la unidad 5a, nivel 1. Le sigue la especie choromytilus chorus con 41 fragmentos identificados que equivale al 6,98% del total de la muestra (Cuadro 5); estos fragmentos han sido recuperados en su mayoría de las siguientes áreas de excavación: sector A, unidad 4, nivel 4 y del sector C, unidad 5a, nivel superficial. Finalmente, aulacomya ater con 21 fragmentos identificados que equivale al 3,58% del total de la muestra (Cuadro 5). Estos fragmentos fueron recuperados en su mayoría (de mayor a menor cantidad) de las siguientes áreas de excavación: sector C, unidad 5a, nivel 1 y del sector A, unidad 4,
nivel 1.

COMENTARIO

En los sitios El Carmen y Caldera; la mayor parte de especies identificadas son comestibles; especialmente las especies: *thais chocolata, aulacomya ater, choromytilus chorus* y *mesodesma donacium* que tienen alto contenido cárnico. Sin embargo, no se ha identificado individuos completos de estas especies a excepción de *thais chocolata*; pero se puede observar que los fragmentos de las otras especies pertenecieron a individuos de buen tamaño.

Se identificaron 14 especies en el sitio Caldera y 10 especies en el sitio el Carmen; sin embargo El Carmen tuvo mayor NMI que Caldera (Cuadros 1 y 4).

La mayoría de especies identificadas, se desarrollan en biotopos rocosos. Se debe señalar, que para la extracción de algunas especies como: *aulacomya ater* y *choromytilus chorus*; se requiere bucear para poder extraerlas (especialmente las de mayor tamaño) (Gorriti 20010).

La especie *pholas chiloensis* merece una mención especial debido a que es un perforador de madera (lugar donde habita) y sólo se registró en el sitio El Carmen (foto 1).


La especie *scutalus sp.* se registró en ambos sitios; sin embargo en el sitio el Carmen se encontraron un buen NMI (Cuadro 1).

Las especies *nassarius gayi* y *argopecten sp.* posiblemente fueron utilizadas para elaborar algún tipo de ornamento.

Las especies: *aulacomya ater* (fotos 2 y 3), *choromytilus chorus* (foto 4)y *mesodesma donacium* (foto 5 y 6) merecen especial atención. Debido, a la gran cantidad de fragmentos registrados en ambos sitios. Se ha podido observar en la mayoría de casos, la reutilización de las valvas. Están siendo fragmentadas mediante cortes; para elaborar posiblemente algún tipo de ornamento (placas ó cuentas) ó herramienta (anzuelos y puntas). Junius Bird, registró anzuelos en sus excavaciones al norte de Chile, elaborados en conchas de *mytilus chorus* y *mytilus magallanicus*. Muelle y Ravines encontraron anzuelos elaborados con *aulacomya ater* (Rostworowski 2005).

Así mismo, en el análisis de restos malacológicos realizado para los sitios Caylán (Nepeña); Chambara, Quipico, Rontoy y Centinela (Huaura) (Rojas 2010) también se observó abundantes fragmentos de la especie *mesodesma donacium* con
cortes similares a los realizados en El Carmen y Caldera (anzuelos). La diferencia entre Caylán y los sitios de Huaura es el periodo en el que se desarrollan estas poblaciones. Infiriendo de esta manera la continuidad en el trabajo de la concha para elaborar anzuelos y la reutilización de material malacológico.

Y al igual que los demás sitios mencionados, hace falta complementar esta información con un análisis detallado del tipo de cortes en las valvas y fragmentos; y un análisis de artefactos líticos o metales asociados a estos contextos (sería muy sesgada la información si sólo se toma en cuenta el análisis de restos malacológicos).

**Comentario Crústaceos**

Sólo en el sitio el Carmen se registró fragmentos de la familia Xanthidae. Lamentablemente, no se pudo identificar la especie.
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ANEXOS
Foto 1: Especie *pholas chiloensis* (perforador de madera)

Fotos 2 y 3: Fragmentos de *aulacomya ater* en proceso de trabajo.
Foto 4: Fragmentos *choromytilus chorus* en proceso de trabajo.

Fotos 5 y 6: Fragmentos de *mesodesma donacium* en proceso de trabajo
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BIOGRAPHY

Ashley Kernachan Heaton grew up on Bainbridge Farm in Muscle Shoals, Alabama. For college she ventured north to Nashville, Tennessee, where she went to Vanderbilt University. During her freshman year at Vanderbilt, Ashley had the good fortune to take an introductory anthropology class from Dr. Beth Conklin. Two or three anthropology classes later, Dr. Conklin suggested that Ashley double major in English and anthropology since there was no minor offered in the latter. Ashley’s first field experience came after her junior year in college where she ran flotation samples for Dr. John Janusek’s project south of Tiwanaku at Khonkho Wankane in Bolivia, and it was this that led her to apply to graduate school. As she was not entirely sure whether she wanted to pursue Mesoamerican or Andean archaeology, Tulane University was a perfect choice for graduate school because of the anthropology department’s strengths in both regions. Since that first field experience in Bolivia, Ashley has worked in Belize for her formal archaeological field school; Peru on Preclassic lithics collected by the Proyecto Arqueológico Norte Chico under Drs. Kit Nelson, Winifred Creamer, and Jonathan Haas; again in Bolivia at Tiwanku under Dr. Alexei Vranich; Guatemala as part of Dr. Francisco Estrada Belli’s project at Holmul and Cival; and then she returned to fieldwork in Peru. In 2008 she had the opportunity to help unwrap and study a mummy from Late Intermediate Period occupation at Rontoy in the Huaura Valley. Dr. Kit Nelson led the mummy project but also took time to introduce Ashley to the Huaura Valley sites of Caldera and El Carmen. Ashley teamed up with fellow graduate student and friend Stacy Dunn to organize fieldwork in the Huaura Valley. They secured a Peruvian codirector, Stephanie Pierce Terry, and were granted a permit to excavate by the Peruvian government. After analysis and writeup, Ashley graduated from Tulane in the spring of 2015.