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Characterizing the Mortuary Practices in Highland Ancash, Per: Analysis of Funerary Contexts at Hualcayn

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CHARACTERIZING THE MORTUARY PRACTICES IN HIGHLAND ANCASH, PERÚ: ANALYSIS OF FUNERARY CONTEXTS AT HUALCAYÁN

by

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A Thesis

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Dedication

Para mis queridos abuelos

Wilfredo, Carmela, Felicita y Efraín.

Acknowledgements

This thesis is the result of much advising and support on behalf of my advisor, professors, peers, friends, and family in Tennessee and in Peru. Many people and institutions in both places have helped me complete this Masters Thesis. I am most grateful for my academic advisor, Dr. Robert Connolly, for his patience, support, guidance, and revisions of this thesis. It would have been impossible to complete this work without his help. Since I met him in 2013, Dr. Connolly has been my mentor and encouraged me to work hard. He has always responded in a timely manner and has provided me with valuable and critical feedback on my classes, projects, and ideas.

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In Perú, field and laboratory work were made possible by the permits obtained by the Ministerio de Cultura in Lima, and by the economic support and facilities of the Proyecto de Investigación Arqueológico Regional Ancash (PIARA). Rebecca Bria served as senior co-director with Felipe Lívora in 2011 and 2012, and with myself in 2013 and 2014. Bria's excavations and analyses were focused on investigating how the ancient community of Hualcayán was reorganized between the Formative Period (1800 - 1 B.C.) and the Early Intermediate Period (A.D. 1-600), a time that witnessed the end of the

Chavín religion and the emergence of Recuay culture and society, the latter of which extended into the Middle Horizon (A.D. 600-1000). The thesis presented here by Cruzado compliments and expands Bria's study by closely examining the remains from six tombs recovered during these excavations. The data for this thesis was collected as part of the Ph. D research program of Rebecca Bria, PhD candidate at Vanderbilt University and co-director of PIARA. I initially agreed to work at PIARA for three months. Because it was mutually beneficial, I decided to continue working for four years. Thanks to Rebecca Bria, I was able to meet the wonderful people from Hualcayán, and grow as a professional, and as a person. She knows I enjoyed my days living and working in Caraz and Hualcayán.

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Abstract

Cruzado Carranza, Elizabeth Katherine, M.A., University of Memphis. March, 2016. Characterizing the Mortuary Practices in Highland Ancash, Perú: Analysis of funerary contexts at Hualcayán. Major Professor: Dr. Robert P. Connolly.

In prehistory, the Peruvian highlands contained a complex array of mortuary practices through space and time. In the Ancash region at the site of Hualcayán, several funerary contexts have been excavated since 2011 that demonstrate this variation in mortuary practices between A.D. 1 to 1000. This thesis presents the results of a study of the archaeological materials excavated from six tombs at Hualcayán and includes the analysis of decorated ceramics, botanical and faunal remains, lithic tools, soil samples and other artifacts. In this study, I will report the entire analysis of excavated materials from the chambers of the six tombs. This complete analysis of recovered cultural materials forms the basis for a model of the content and distribution of the types of mortuary settings at Hualcayán and their variations through time and space.

Preface

The work described in this thesis was conducted for the Archaeology Program at the Department of Earth Sciences, University of Memphis under the supervision of Dr. Robert Connolly. This thesis is the result of my own research, except where explicitly stated otherwise. No part of this thesis has been submitted to this or any other university for any degree or diploma.

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Chapter 1 – Introduction

In this thesis, I address the characteristics of mortuary practices at the archaeological site of Hualcayán in highland Ancash, Peru during A.D. 1 to 1000. Hualcayán is a complex site with more 4000 years of occupation in an area of 4 square kilometers (Figure 1). This study contains four research questions: (1) Which burial pattern variations occurred in Hualcayán from A.D. 1 to 1000? (2) What are the burial pattern variations within funerary structures (*chullpas* and *machays*) at the site of Hualcayán from A.D. 1 to 1000? (3) What were the similarities and differences in burial pattern variations within funerary structures by chambers at the site of Hualcayán? (4) How do the data about mortuary practices in Hualcayán support the overall interpretation of the site?

This research will focus on two sectors of Hualcayán: a) Sector A, or Perolcoto, with a concentration of ancient architectural structures, and b) Sector C, or Ichick Tzapa, with a concentration of agricultural terraces, canals and tombs (Lívora and Bria 2012: 22). This research is focused on the analysis of the archaeological remains from 6 funerary contexts: Operation 3, Operation 6, Operation 8, Operation 11, Operation 12 and Operation 21.

Previous research on mortuary practices in highland Ancash during the Early Intermediate Period (200 B.C. – A.D. 700) to the Middle Horizon Period (A.D. 700 - 1000) has focused on the analysis of architecture, pottery, animal and human bones, textiles, and stone objects (Lau 2002: 279). This study expands on this research by studying mortuary ritual with a more holistic approach that integrates the analysis of soil and botanical remains. This study of Hualcayán tombs thus includes the following

components: architecture, botanical and faunal remains, decorative ceramic sherds, lithic tools, soil samples, human bones, and other artifacts that were recovered during the excavations of funerary contexts conducted by Ancash Archaeological Research Project (PIARA) during the 2011, 2012 and 2013 seasons at the site of Hualcayán (Lívora and Bria 2012, 2013; and Cruzado and Bria 2014).

This holistic archaeological approach uses multiple analytical techniques to classify, identify and interpret archaeological remains with the goal to determine the characteristics of mortuary practices at the Hualcayán site during 200 B.C. to A.D. 1000. The Early Intermediate Period and the Middle Horizon are two phases in the Peruvian prehistory with complex characteristics because of the development of agriculture and pastoralism in different econiches, construction of monumental ceremonial centers, and the manufacture of a variety of crafts and ornaments.

The data for this thesis was collected as part of the research program and dissertation of Rebecca Bria, PhD candidate at Vanderbilt University and principal investigator and co-director of PIARA. The excavations and analyses done by Bria were focused on investigating how the ancient community of Hualcayán was reorganized between the Formative Period (1800 - 1 B.C.) and the Early Intermediate Period (A.D. 1 - 700).

In this thesis, I explore the questions about the extent of variations in burial patterns from 200 B.C. to A.D. 1000 at the site of Hualcayán. In Chapter 2, I discuss the theoretical component of this thesis, placing an emphasis on the approaches to study funerary contexts in ancient Peru. In Chapter 3, I present the geographic and environmental component of the Ancash region. In Chapter 4, I review the archaeological

literature of the Ancash region, Callejón de Huaylas Valley, and Hualcayán site. In Chapter 5 is a description of the methodology for the analysis of the archaeological materials found in the funerary contexts in Hualcayán. In Chapter 6, I describe the funerary contexts at Hualcayán, including the description of cultural features, cultural materials, and an interpretation of each tomb. Finally, in Chapter 7, I consider the results of the study of funerary contexts in Hualcayán by describing my contributions to investigation that includes a holistic archaeological approach and the importance of studying looted tombs.

Figure 1: Location of Hualcayán site.
Earthstar Geopraphics, Esri, HERE, DeLorme, NGA, USGS.

Chapter 2 – Theoretical Component

2.1. Approaches to the Study of Funerary Contexts in Ancient Peru

The study of mortuary practices in highland Ancash, Peru has received intermittent archaeological study (Bennett 1944; Isbell 1991; Paredes, Quintana and Linares 2000; Ponte 2001; Lau 2001; Herrera 2005, 2007; Matsumoto 2006; Ibarra 2013). Most previous mortuary studies have been done on the Peruvian coast, where the preservation of human remains is optimal, because the dry weather of the dessert is favorable for the preservation of organic remains.

In highland Ancash, Ibarra (2103) reports funerary traditions from 1,000 B.C. until A.D. 1,500 in the Conchucos area (eastern Ancash). Ibarra describes the architecture of the funerary structures, studies the osteological analysis of human remains, and radiocarbon dating analysis with the goal to identify characteristics of each funerary tradition through time.

Few datasets exist that describe the mortuary practices at archaeological sites in highland Ancash. Most of the research about the funerary context at Hualcayán is focused on the bio-archaeological studies of the human remains, including age assessment, sex determination, indicators of stress, analysis of osteoarthritis and trauma. Based on excavations conducted by Rebecca Bria, Felipe Lívora, and myself, Pink (2013) examined the population genetic variation to understand patterns in biological affinity and social interactions with other groups, Molano (2014) defined the variation in artificial cranial modification, and Witt (2012) detailed the mortuary skeletal sample of tombs at Hualcayán. Also, Norgon (2013) completed a spatial analysis of more than 80 tombs, with the goal to identify mortuary ritual and ancestor veneration practices at Hualcayán.

Moreover, Gravalos (2014) conceptualized community identity of weavers through the analysis of fragmented textiles found at Hualcayán tombs. Finally, from 2009 to 2014, Bria's research at Hualcayán focused on defining the characteristics and organization of the ancient community of Hualcayán (Lívora and Bria 2012 and 2013, Cruzado and Bria 2014).

Beyond preliminary observations, no previous research has employed examination of multiple lines of evidence in the analysis of mortuary cultural materials at Hualcayán. For that reason, my incorporation of the detailed material analysis of all the archaeological remains found in six funerary contexts of Hualcayán provide insights about these activities from A.D. 1 to 1000. The information from the excavations, coupled with the analysis of ceramic sherds, botanical and faunal remains, soil samples, human bones, and architecture provide the data for this study.

2.2. Hypotheses

I developed three sets of hypothesis to examine multiple lines of evidence for the variation and significance of burials at Hualcayán. The first set addresses variation and continuity in burial practices. The second set addresses funerary structures. The third set tests variations within the burial chambers at the site of Hualcayán.

1. Hypotheses regarding variation and continuity in burial practices.

H_0 Given available data, nothing can be said about burial pattern variations through time at the site of Hualcayán.

H_1 There is no evidence in the archaeological record of variation in burial patterns from A.D. 1 to 1000 at the site of Hualcayán.

H_2 There is evidence in the archaeological record of variations in burial patterns between A.D. 1 to 1000 at the site of Hualcayán.

2. Hypotheses regarding funerary structures.

H_0 Given the available data, nothing can be said about burial pattern variations within funerary structures by type (*chullpas* and *machays*) at the site of Hualcayán.

H_1 The burial pattern variations within funerary structures by type (*chullpas* and *machays*) were similar from A.D. 1 to 1000 at the site of Hualcayán.

H_2 The burial pattern variations within funerary structures by type (*chullpas* and *machays*) were different from A.D. 1 to 1000 at the site of Hualcayán.

3. Hypothesis regarding the Hualcayán site.

H_0 Given the available data, nothing can be said about burial pattern variations by chambers within individual funerary structures at the site of Hualcayán.

H_1The burial pattern variations within funerary structures by chambers within individual funerary structures were similar from A.D. 1 to 1000 at the site of Hualcayán.

H_2 The burial pattern variations within funerary structures by chambers within individual funerary structures were different from A.D. 1 to 1000 at the site of Hualcayán.

2.3. Approaches to Study Tombs

The archaeological site of Hualcayán is one of a few recently excavated sites with a continuous occupation in the Ancash region from 1800 B.C. to A.D. 1000. In the Ancash region there are some studies about ancestor veneration and mortuary practices

based on archaeological research. In the Callejón de Huaylas valley, few sites with funerary features have been investigated, for example Pierina (Ponte 2001), Carhuaz (Paredes, Quintana and Linares, 2000), Honcopampa (Isbell 1991), Quebrada Llanganuco (Matsumoto 2006), Katyamá (Zaky 1987), Wilkawaín (Bennett 1944), and Keushu (Herrera 2007). In this area, Hualcayán is one of the sites in the region that has a complex history, including a funerary area. For that reason, my study of funeral traditions at the Hualcayán site provides insights of the cultural affiliations with the tombs. This thesis provides specific characteristics of mortuary practices in the Callejón de Huaylas area.

Also, my thesis research links with previous osteological studies done by Pink (2013), Molano (2014), and Witt (2012) and provides a more holistic definition of the characteristics of funerary practices in Hualcayán from A.D. 1 to 1000. This more holistic definition results from my including the analysis of other archaeological materials, like ceramic, lithic tools, and the architectural structures. The integration of all these analyses provides insights on the complex relationships between the data and artifacts collected during the excavation of the tombs.

Finally, this study identifies the variation through time and across space of the mortuary practices. With the definition of the characteristics of each tomb, it is possible to determine the chronological period of each funerary context based on the characteristics of the ceramic shers and other elements.

Chapter 3 - Geographical and Environmental Component

3.1. The Callejón de Huaylas Valley

The Santa Valley is an inter-Andean valley in the Ancash region, due to its location between two mountain ranges, the Cordillera Blanca to the east, and the Cordillera Negra to the west. There are sixteen 6,000 m peaks in the Cordillera Blanca, and a further seventeen peaks over 5500m (Biggar 2015). The Cordillera Blanca includes the Huascarán mountain peak, the highest mountain in Peru at 6768 masl, and the third highest in the Western Hemisphere.

The Santa River, the largest river on the coast of Peru, runs north to south, through the Callejón de Huaylas highlands, and turns west into the Pacific Ocean (Bennett 1944). This river is not commercially navigable but has always furnished the valley with water. This area is also known as the Callejón de Huaylas.

The Callejón de Huaylas is made up of several ecological zones, including the *Quechua* (2000 – 3000 masl), the *Suni* (3000 – 4000 masl), the *Puna* or *Jalca* (4000 – 4800 masl), and the *Janca* (4800 - 6768 masl) (Pulgar Vidal 1972). The best areas for cultivation are the valleys, located from 2000 to 3500 masl. The climate in the Callejón de Huaylas is mostly subtropical and dry. The rainy season lasts from October to April, during which time it rains nearly every day. The other half of the year is hotter and drier.

3.2. The Archaeological Site of Hualcayán

The archeological site of Hualcayán (HU01) lies at the headwaters of the Santa River, within the jurisdiction of the Community of Hualcayán, District of Santa Cruz, Province of Huaylas, Department of Ancash, in the Huascarán National Park. The site is located at latitude 8^{o} 89´ 85¨ South, and longitude 77^{o} 79´70¨West, and has UTM

coordinates of 9015200 North, and 192358 East (Lívora and Bria 2012:4). The site straddles the western slopes of the Cordillera Blanca, with the main area of the site reaching an elevation of 3,221 masl (Figure 2).

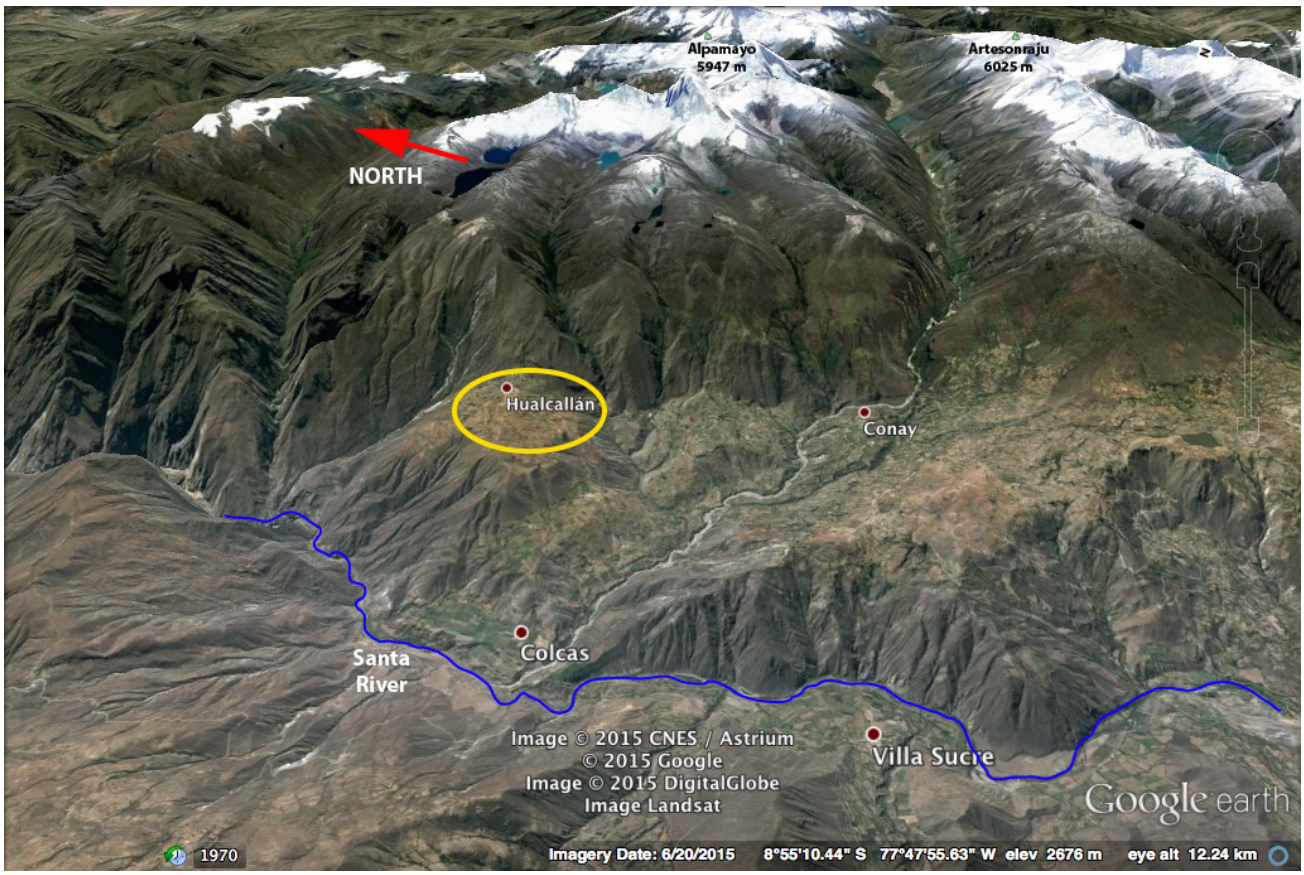

Figure 2: Location of Hualcayán and its sectors.
Original Map from Google Maps, modifications added by the author.

Hualcayán is located about an hour by car up the mountainside from Caraz and there is about a 1,000 meters difference in altitude between these two places (Figure 3). However, the amount of rainfall is very much dependent on the elevation of a given area. For example, during the rainy season, the city of Caraz (2256 masl) receives intermittent rainfall and sunshine throughout the day. However, Hualcayán is overcast for most the day, receiving much more rainfall than Caraz. While there is a marked seasonality

regarding precipitation, the temperatures of the Callejón de Huaylas Valley do not fluctuate much throughout the year. However, diurnal fluctuations in temperature occur, depending on the time of the day and the altitude.

Figure 3: Location of Hualcayán site.
Original Map from Google Maps, modifications added by the author.

Hualcayán is located in the *Quechua* zone (Pulgar Vidal 1972), a warm region of the highland Andes between 2300 to 3500 masl. The weather in the *Quechua* zone is warm and dry most part of the year. The rainy season last six months. The geographical relief of this area varies. Those who now live in this area are mainly engaged in agriculture and grazing. Forty years ago, Hualcayán was very desolate, and the land was used for grazing of small animals, while people lived in this area occasionally. Because of the increased interest in the lands of Hualcayán, the residents of nearby communities

of the district of Santa Cruz gradually inhabited this place. In addition to its rich landscape, the community of Hualcayán has a very rich cultural heritage, which includes a significant historical legacy and modern traditions (Cruzado 2015).

Chapter 4 - Archaeological Background

4.1. The Archaeology of the Ancash Region

The department of Ancash is located about 400km north of Lima (the capital of Perú). Ancash has two parallel mountain chains, which dominate the territory, the Cordillera Negra in the west, and Cordillera Blanca to the east (Ibarra 2013:2). The glaciated Cordillera Blanca is the highest mountain system in Perú and includes peaks of over 6000 masl. The Santa River runs between these two cordilleras forming the valley known as the Callejón de Huaylas. The Callejón de Huaylas is the area where most of the investigations have focused on post-Chavín occupations, including the Huarás ceramic style, Recuay, and Wari cultures (Lau 2002:177-178) that developed during the Early Intermediate Period (A.D. 1 - 700) to the Middle Horizon Period (A.D. 700 – 1000).

The archaeology in highland Ancash has a complex history with evidence from the Early Pre-ceramic Period (12,000 – 6000 B.C.) to the Late Horizon Period (A.D. 1400 - 1532) (Ibarra 2004:11-15, 2013:2-4). The number of archaeologists working in highland Ancash has increased in the last few years. The increased research has created a diversity of works that make a broader understanding of the economy, political organization and relations with other regions of ancient cultures possible. During 800 B.C. to A.D. 1000, the Chavín, Recuay, and Wari are the primary cultures that have been researched because of their complex architecture and decorative ceramics that are well preserved and located close to modern cities. (Bennett 1944; Burger 1992; Lau 2001, 2002, and 2004; Isbell 1991) (See Table 1).

Table 1. Chronological Periods in Peruvian Culture.

<table>
<tr><th rowspan="2">Time Scale</th><th colspan="2">Periods</th><th rowspan="2">Ancash sequence</th></tr>
<tr><th>L. Lumbreras</th><th>J. Rowe</th></tr>
<tr><td>1532</td><td>Inca Empire</td><td>Late Horizon</td><td>Inca</td></tr>
<tr><td>1400
1300
1200
1100
1000</td><td rowspan="2">Regional States</td><td rowspan="2">Late Intermediate Period</td><td rowspan="2">Aquillpo</td></tr>
<tr><td rowspan="2">800

600</td><td rowspan="2">Wari Empire</td><td rowspan="2">Middle Horizon</td><td rowspan="2">Wari</td></tr>
<tr><td rowspan="2">200
A.D.</td><td rowspan="2">Regional Development</td><td rowspan="2">Early Intermediate Period</td><td rowspan="2">Recuay</td></tr>
<tr><td>0</td><td rowspan="5">Formative Period</td><td rowspan="3">Early Horizon Period</td><td>Huarás</td></tr>
<tr><td>B.C.
200
400</td><td rowspan="2">Chavín</td></tr>
<tr><td>800
900
1000
1200</td><td rowspan="3">Initial Period</td></tr>
<tr><td></td><td>Toril</td></tr>
<tr><td>2000
3000
4000</td><td rowspan="2">Archaic Period</td><td>Late Pre-ceramic</td><td>Chaukayan,
Las Haldas,
Los Gavilanes,
La Galgada</td></tr>
<tr><td>5000
6000</td><td rowspan="2">Middle Pre-ceramic</td><td rowspan="2"></td></tr>
<tr><td>8000
9000
12000</td><td>Lithic Period</td><td>Early Pre-ceramic</td><td>Quishquipunku
Guitarrero</td></tr>
</table>

(Cáceres 1988)

The Early Intermediate Period (EIP) (A.D. 1 - 700) is defined in terms of profound sociopolitical changes, including the increasingly centralized regional authorities, densely settled populations, monumental architecture, technological

innovations, expanding polities, economic production, religious practices, and the manufacture of prestigious crafts during A.D. 1 to 700 (Gero 2001:17, Lau 2002:177).

One of the cultures that developed during the EIP was the Recuay, which was extensively studied recently by George Lau. He defines Recuay culture as one that "emerged as the unprecedented regional development in the Peruvian cultural chronology" (Lau 2002:181), and as a "political structure composed of small, independent political entities that shared strong ties in iconography, technology and funerary patterns" (Lau 2001:25). According to Lau, Recuay communities "were able to organize production through festive labor and generous displays of wealth and redistribution" (Lau 2001:12).

The physical manifestations of this society are defined in decorative ceramic and stone sculpture, with iconographic elements that distinguish political ideology by representing important people. The sites reflect certain autonomy and a social order, probably with a chief in each site, who transmitted orders and managed the economy.

The Recuay's geographic boundaries coincided with the Cordillera de Huayhuaysh and the Pativilca Valley to the south, the Río Marañón to the east, and the Pallasca Region in the north. As evidenced by their distinctive fine-ware pottery, Recuay people sometimes descended to different parts of the lower coastal valleys leading into the Pacific Ocean, between the Huarmey and Virú valleys. However, most Recuay groups of Ancash were probably limited to middle valley areas of the Pacific-Andean flanks, known as the Cordillera Negra. Moreover, Recuay groups prospered through cultural and economic transitions to different ecological zones. Those ecological zones or ¨floors¨ were: the *Quechua,* or High valleys, *Suni,* or High plateaus and cliffs, and *Puna,*

or Mountaintop, with a variation between the 2300 to 4200 masl. Many settlements were occupied in strategic locations of these ecological zones. This knowledge of the geography allowed Recuay groups to have exchange routes, establish small communities, produce a variety of agricultural products, and raise camelids (Lau 2004:178).

Some archaeologists consider the Wari culture as the first state level society in Peruvian history (Isbell and Schreiber 1978:374-375). The architectural expansion of this culture is reflected on administrative settlements and funerary areas distributed in highland and coastal areas of Peru. Moreover, Wari influence is reflected on the material culture in the same areas, where the artifact forms and art styles have similar designs to the ones in the capital of Wari.

Wari was also a state that controlled much of the Andean territory during the Middle Horizon Period (A.D. 700 – 1000). The Wari occupation and influence in Callejón de Huaylas (highland Ancash) during the Middle Horizon Period is well known at the site of Honcopampa, located 105 km south of Hualcayán, where architecture, ceramic and carbon samples allowed dating of the site (Isbell 1991:34). Isbell (1991) has described the architectural structures of Honcopampa with the "D" shape structures indicating evidence from the Wari capital.

The evidence for funerary practices, ancestor veneration, and public feasting for the northern highlands of Perú between A.D. 250-650 is based on iconographic and archeological remains, including the public and mortuary architecture, ceramics, faunal remains, and stone sculptures (Lau 2002:279). These funerary events represented expressions of the political relationships, cohesion, the power of union and art of

communities during the EIP (A.D. 1 - 700), and probably included food and drink consumption, as well as dances and music (Kaulicke 2005: 388).

Improving the understanding of food consumption patterns related to ancestor veneration and public feasting in Hualcayán has implications for other sites in the northern highlands of Perú. However, little is known about food consumption at these events, because archaeological research projects have not included the analysis of botanical remains. In the following section, I describe two examples of ancestor veneration and public feasting in Recuay sites located in the northern highlands during the EIP (A.D. 1 - 700).

4.2. The Archaeology of the Callejón de Huaylas Valley

The Callejón de Huaylas Valley has a wealth of archaeological sites that demonstrate a long period of occupation and cultural complexity throughout the valley. Several Pre-ceramic sites have been documented in the area (Lynch 1971). The Guitarrero Cave (2,580 masl) is the most studied site archaeologically, located near the town of Mancos approximately 150m above the Santa River in the Cordillera Negra (Lynch 1971, and 1980; Lynch et al. 1985). The earliest sites associated with temple construction in this area are the site of Huaricoto (2,796 B.C.) in the Callejón de Huaylas (Burger and Burger 1980), and at the site of La Galgada (2,820 B.C.) in the Tablachaca Valley, just north of the Callejón de Huaylas where the Santa River turns west toward the ocean (Grieder 1988).

In the Callejón de Huaylas Valley, the periods after the EIP and the Late Horizon (A.D. 200-1532) have been investigated more frequently than Formative and Huarás (Herrera 2005; Lane 2005; Lau 2004; Tschauner 2004) with the exception of

investigations in Huaricoto (Burger and Salazar 1980 and 1985) and Tumshukaiko (Bueno 2004; 2005a; and 2005b). Perhaps, the period least known and understood is the transition between Early Horizon (800 B.C. - 0) Period and the Early Intermediate Period (A.D. 1 - 700), also known as Huarás Period (0 – A.D. 200) (Lau 2004).

The investigations done at the archaeological site of Hualcayán in the Callejón de Huaylas, located in the Cordillera Blanca, provides information of the transitional Huarás Period (0 – A.D. 200), based on the study of the architecture and artifacts interpreted as ceremonial areas.

4.3. The Archaeology of the Hualcayán Site

The main analysis for this study is based on a dataset recovered from archaeological research at the site of Hualcayán. Excavations have revealed that Hualcayán has been occupied for several chronological periods from the Late Preceramic Period to the Late Intermediate Period, or between 2300 B.C. to A.D. 1450 (Lívora and Bria 2012, 2013; and Cruzado and Bria 2014). The site is located in the northern highlands of the Callejón de Huaylas at 3221 masl, in the community of the same name, District of Santa Cruz, Province of Huaylas, Department of Ancash, Perú (See Figure 4).

Hualcayán has four sectors with a concentration of ancient architectural structures: Sector A (Perolcoto), Sector B (Panchocuchu), Sector C (Ichick Tzapa), and D (agricultural terraces). Each of these sectors contains a concentration of agricultural terraces, canals, plazas, mounds, and tombs (Cruzado and Bria 2014:15-16). Some of the terraces and plazas have different shapes and dimensions, including oval, semi-circular and rectangular shapes. In addition, some of the plazas are sunken or at the level of the terrace.

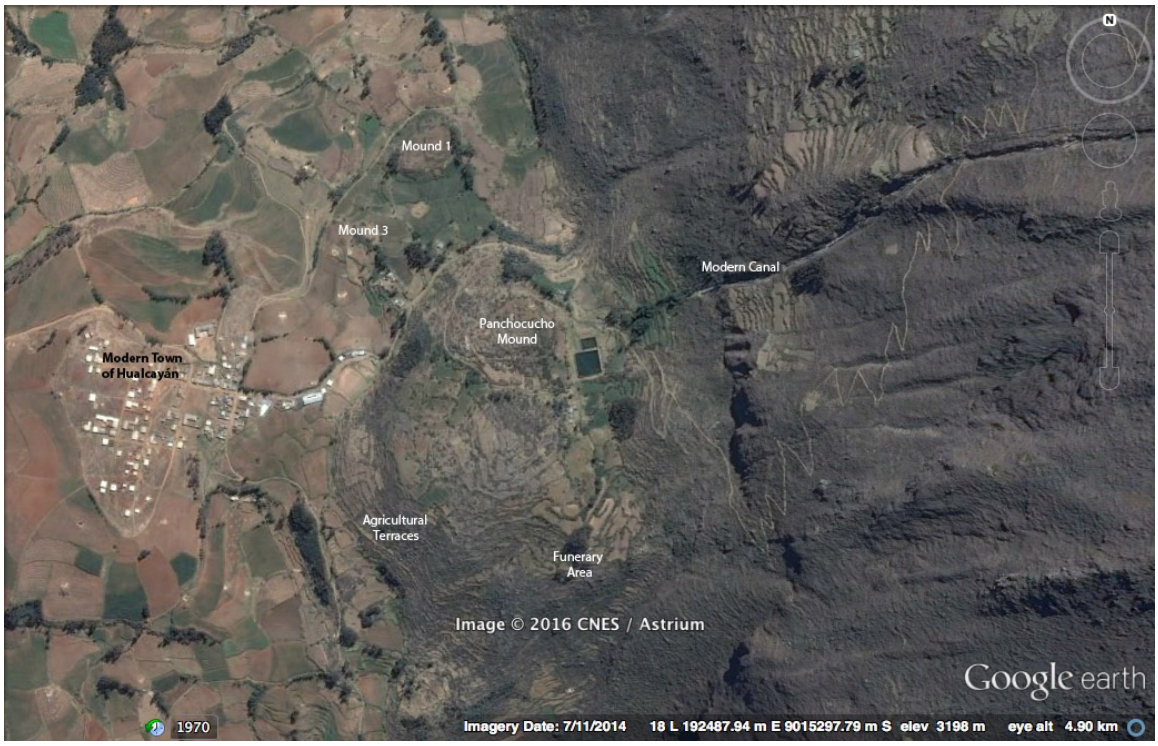

Figure 4: Location of Hualcayán site.
Original Map from Google Maps, modifications added by the author

This study includes the analysis of the archaeological materials found in six tombs, one located in the Sector A, and five located in Sector C. In Sector A, one unit designated "Operation 6" was chosen for this study. Operation 6 is a unit located in a platform on the southeast side of the mound M1. This unit measures 49 m^2. In Sector C, five tombs were chosen, and these include tombs designated as Operations 3, 8, 11, 12, and 21.

In Hualcayán, three main types funerary structures were built: subterranean tombs, *machays* and *chullpas.* A subterranean tomb includes a structure that lies underground, almost beneath stones and boulders. Sometimes a cavity was excavated underneath; low walls were built to create the chambers, and a small entrance. As at other sites in highland Ancash (Lau 2011), these tombs generally had multiple chambers and

are associated with multiple individual burials.

A *machay* is the Quechua (local language) name for tombs in caves. According to Quechua speakers, *mallquis* or mummy bundles are found inside the *machays* tombs. In this thesis, the term *machay* is understood as an enclosed stone mortuary structure built beneath a boulder to create a cave for the interment of multiple individuals (Ponte, 2009; Lau, 2008; Herrera, 2008; Gerdau and Herrera 2010).

A *chullpa* tomb however, is a small funerary tower constructed for more than one person. *Chullpa* is the funerary construction of an ethnic group (DeLeonardis and Lau 2004). In general, those at Hualcayán are rectangular and constructed with rocks. In both, *machays* and *chullpas*, corpses were placed along with some of their belongings, including clothing and common equipment.

The tombs excavated in Operations 3, 8, 11, 12, and 21 are all found in Sector C in Hualcayán, and have a very different character than the semi-subterranean tomb exposed in Operation 6, which is located in Sector A.

Chapter 5 – Methodology

The study of mortuary practices in highland Ancash has been received intermittent archaeological study (e.g. Bennett 1944; Ponte 2001; Lau 2001; Herrera 2005). Most of the studies have been done on the Peruvian coast, where the preservation of human remains is optimal; the dry weather of the dessert is favorable for the preservation of organic remains. However, in highland Ancash, Ibarra (2103) studied funerary traditions from 1,000 BC until 1,500 A.D. in the Conchucos area (eastern Ancash).

5.1. Sampling strategy

According to Bria, she applied a non-systematic sampling strategy to determine the tombs for excavation at Hualcayán. She used four criteria for her selection: 1) to sample at least one of each kind of tomb at Hualcayán, subterranean tomb, *machay*, *chullpa*, and *chullpa-machay*; 2) to sample at least one tomb from each area of tombs present (Sector A, B, and C at Hualcayán); 3) to excavate the best preserved examples of each type since virtually all tombs are disturbed; and 4) to excavate a range of Hualcayán´s period, which were represented by the surface ceramics (Rebecca Bria 2016, personal communication).

5.2. Detailed Techniques

Several characteristics of each material type were used to generate data to analyze the archaeological materials found from the six tombs excavated in Hualcayán. Each material type recovered from the tombs was analyzed by selecting a set of attributes that would provide information on an artifact´s production and use. The results from those analyses were then summarized for each material type so that they could be compared

between different tomb contexts to test my three research questions. The characteristics were done based on analyses of the ceramic, lithic, faunal, botanical, heavy and light soil sample, Minimum Number of Individuals (MNI) of human remains, and other artifacts. All of the materials recovered in the excavations of these tombs were documented based on their formal characteristics, including a basic analysis, measures, and photographs, as presented in the thesis.

5.2.1. Ceramic Sherds Analysis

The ceramic analysis was completed for all decorated sherds, including decorated rim, base, handle, and body decorative sherds. These analysis of decorated fragments was done because this kind of sherds reveal more information about the chronological and cultural affinity of the tombs.The attribute analysis of the ceramic sherds identifies the morphologic features and the stylistic similarity from other regions of the same period. The analysis of each ceramic fragment focuses on the study of attributes that serve to distinguish the morphological and functional characteristics of the vessel, as well as its decoration indicated by Rice (1987), and Martinez (2001). All ceramic analysis data included in the text or tables in this thesis are listed in Appendix A.

The ceramic sherds represent one of the most populous classes of artifacts recovered in the tombs at Hualcayán. Also, the diversity of ceramics in terms of vessel forms and decorations provides chronological information of each tomb. The general categories of the attribute analysis include:

General Characteristics of the Ceramic Assemblage:

This part of the ceramic analysis includes the provenience information of each ceramic sherd, including the tomb number, and any cultural feature number.

Diversity of Ceramic Vessel Form:

This section of the analysis is to identify the kind of vessel fragment, including complete vessel, rim, body, base, handle, neck, shoulder, cone handle, reutilized fragment, mold, and unidentified fragment. The ceramic fragment provides information about the possible whole shape of the vessel, some of them are the open vessel, closed vessel, plate, bowl with out-flaring angled lip (*escudilla*), bowl, pot, jar, large jar, bottle figurine, spindle whorl, colander, cup, and unidentified vessel.

Morphological Characteristics of the Ceramic Sherds

I analyzed the characteristics of lip, rim, base, and handle sherds found in the funerary contexts at Hualcayán. Archaeologists name these fragments as diagnostic sherds because they can determine the form, function or periodization of the whole piece (Rice 1987, and Martinez 2001). In this section, I include the classification of each type of lip, rim, base, and handle sherd (See Table 2 for descriptions).

Table 2: Description of Ceramic Parts for Analysis.

Ceramic Part	Description	Types	Reference
Lip	The edge of the orifice of the vessel sometimes refers more specifically to a modification of a rim for pouring.	Convex, pointed, half-pointed, and concave.	Rice 1987:478
Rim	The area between the lip or margin and the sidewall or neck of a vessel, sometimes used interchangeably with lip, especially if there is no change of orientation between the lip and neck or wall.	Open, closed, direct, thinning, and fatting.	Rice 1987:481
Base	The underside of a vessel, or that part of a vessel in contact with the surface it rests on during normal use.	Flat and convex.	Rice 1987:472
Handle	An appendage attached to the exterior wall of a vessel´s body, neck or rim, which facilitates the manipulation or suspension of the vessel or is a decorative feature.	Tube-shaped and flat-strap.	Martínez 2001:53

Manufacture of the Ceramic Sherds

There are several methods for the manufacture of the ceramic vessels. The types of manufacture method include modeled technique, coiled technique, paddled technique, molded technique, and unidentified manufacture method. The paste color of the ceramic sherd is included in this study as well. The type of firing technique of the ceramic sherd, oxidized and reduced, depends on the atmosphere used for the firing of the vessel. Also, I included the firing related production errors of the ceramic sherd, like absent, fired cloud, bulges, not well fired, and unidentified errors.

Decoration Techniques of the Ceramic Sherds

There is a variety of decoration techniques, like absent decoration, incised decoration, engraved decoration, stamped decoration, painted decoration, molded decoration, modeled decoration, burnished decoration, applique decoration, and unidentified decoration technique. Also, the nature of colors of the ceramic sherds can determine how many colors were used for the decoration, and the vessels can be monochrome, bichrome, tri-color, polychrome, and unidentified nature of colors. The description of the decoration techniques of the ceramic sherds provides information to estimate the chronological period funerary practices at Hualcayán.

5.2.2. Lithic Tools Analysis

Robert Connolly conducted the analysis of the lithic tools at the PIARA laboratory-house at Hualcayán during the summer 2015. All lithic analysis data included in the text or tables in this thesis are drawn from Appendix B.

5.2.3. Faunal Bones Analysis

The faunal analysis, conducted by Teresa Rosales at the University of Trujillo (Perú) includes the identification of animal bones, primarily amphibious, birds, camelids, small and large mammals, and rodents. All faunal analysis data included in the text or tables in this thesis are drawn from Appendix C.

The taxonomic identification of animal remains is based on the morphology of the skeletal remains provides information about the faunal spectra for the funeral contexts at Hualcayán site (English Heritage 2014). In this analysis, I include the scientific name of the species, correctly italicized and capitalized, as well as its common name. The use of scientific names prevents any confusion, because the common names are translated from a different language. Also, with the identification of the species in the tombs I classify them in two categories, native and non-native species. This information defines if there was or not any modern disturbance of the funerary contexts.

For the quantification of the fragmented faunal remains, I use the Number of Identified Individual Specimens (NISP), because this method provides accurate data that can be combined and compared (English Heritage 2014:30). In this analysis, each bone and fragment is considered as one unit that provides estimates for the numbers of individuals at each funerary context at Hualcayán. However, the NISP could overestimate or underestimate the actual number of individuals in each context. Also, this study provides information of the fragmented, completed and burned bones (White 1953; Miller 1979; Flannery 1986; Lau 2002).

5.2.4. Botanical Remains Analysis

By applying paleoethnobotany, which is the study of past cultures by an examination of human population´s interactions with the plant world, this analysis

includes the analysis of the soil samples and botanical remains, from a space next to a funerary contexts (Pearsall 2010; Hastorf and Popper 1988). Paleoethnobotany is an important component of a comprehensive study of any archaeological site, in addition to ceramic, lithic or faunal analyses. It is crucial to include the paleoethnobotanical perspective in the study of funerary patterns in Hualcayán, because it has an ecological focus by identifying the impact of humans on environments, cultural interpretation, and living conditions of prehistoric manifestations from A.D. 1 to 1000.

The macro-botanical remains in the funerary contexts at Hualcayán is so well preserved because of their location in small caves. This location provided a dry preservation, also known as desiccation, where the absence of oxygen in the environment prohibits microbial activity (Gallagher 2014:20).

First, the botanical remains are classified into their parts, including seed, leaves, flower, fruit, legume, wood, fiber, root, tuber, stem, complete plant, bark, charcoal and cactus. Then, the analysis includes the identification of plants based on the characteristic of each botanical remains. When identification of samples is accomplished, the most challenging part of paleoethnobotanical analysis is the presentation and interpretation of results. The wild and cultivated plant materials expected in this analysis are the following: seeds, fruits, wood, roots, tubers, fibers, leaves, and non-woody stems. Because of the lack of preservation of perishable materials in the highlands of Ancash, most of the macrobotanical remains are carbonized plant remains (Towle 2007). All botanical analysis data included in the text and tables in this thesis are draw on Appendix D.

5.2.5. Soil Sample Analysis

The human activity can result in the alteration of the soil. Soil samples from archaeological contexts often contain micro-botanical items, faunal species, and other small items; concentrated in features, like funerary contexts (Adams and Gasser 1980, McWeeney 1989). The soil sample analysis was done through flotation, as a recovery technique that provides two samples, the light fraction, which are the organic materials are suspended in water; and the heavy fraction, which are the materials that sink to the bottom of the flotation device (Pearsall 2010, Wegner 1988). Both samples were processed and separated into plant and animal remains, and other types or artifacts.

During the field seasons 2011, 2012 and 2013 at the archaeological site of Hualcayán, all excavated materials were passed through a ¼ inch mesh screen, and all visible remains were collected. Also, a liter of soil samples of sediments was systematically collected from each archaeological context of processing in the laboratory during the excavations at Hualcayán in 2011 and 2012 (Lívora and Bria 2012, 2013; and Cruzado and Bria 2014).

Once in the laboratory, each liter sediment sample was subjected to the following procedure: the first technique used to process the 161 soil sample bags is called water screening, in which the soil was washed by spraying from above or shaken on a screen under water, with material remaining on the screen then removed for study. Three different screen sizes were used for the water screening: 5 mesh (4mm), 10 mesh (2mm) and 35 mesh (0.5mm) screens. Next, when the samples were dried, the taxon of each seed and plant fragment was identified using magnifying lenses and stereoscopes. Finally, the analysis records of the identification includes the correct provenience information about

the labels in the bags, including the excavation unit or operation numbers, grid number, sub-operation unit number, and the context.

All soil sample analysis data included in the text or tables in this thesis are drawn from Appendix E.

5.2.6. Human Bones Analysis

The bioarchaeologist Emily Sharp conducted the analysis of the human bones, by determining MNI (Minimum Number of Individuals), sex and age at the PIARA laboratory-house located in the community of Hualcayán during the summer 2014. All human bone analysis data included in the text or tables in this thesis are drawn from Appendix F.

The Minimum Number of Individual (MNI) analysis provides a hypothetical number of individuals that could account for all of the elements in the assemblage (White and Folkens 2005:423). This technique includes sexing by examination of the skeleton is based upon the appearances of pelvis and skulls (White and Folkens 2005:385). This analysis defines the distribution of human remains in the different funerary contexts at Hualcayán. Other studies about pathologies, and cranial modification of individuals in Hualcayán have been conducted in the last few years (Pink 2013, and Molano 2014). These data on the MNI demonstrate the distribution of individuals in the funerary structures at Hualcayán. This information is important to reconstruct the mortuary activities in each tomb, and provide insights about other practices related to the funerary patterns.

The MNI calculations were done based on the calculations of crania and long bones, including clavicles. With this information, Sharp identified the amount of sub-

adults (male and female), male adults, probable male adults, female adults, probable female adults, and unidentified sex adults in each tomb. While the MNI calculations were based on long bones and clavicles, only the bones that are at least 75% complete were identified and have been sided, left and right. With this information, Sharp defined the amount of adults and sub-adults in each tomb (See Appendix F). These calculations represent a *mortuary sample*, not a representative of a normal living population.

Chapter 6 – Funerary Contexts in the Archaeological Site of Hualcayán

The excavation data from the Operations 3, 6 and 8 are from the archaeological report written by Lívora and Bria in 2012. The excavation data from the Operations 11 and 12 are from the archaeological report by Lívora and Bria in 2013. Finally, the excavation data from the Operation 21 is from the archaeological report written by Cruzado and Bria in 2013. The three reports were submitted to the Ministerio de Cultura in Peru. The analysis of the diagnostic ceramic sherds, soil sample analysis, and botanical analysis were conducted by myself during the summer 2015. I designed the content and the forms for the analyses of these materials

I only analyzed diagnostic ceramic sherds because they can provide information on the nature of the contexts, chronology, manufacture technology, distribution, function, and use, by representing the cultural expression from a group (Prehistoric Ceramics Research Group 2010).

The lithic tools analysis, done by Connolly, allowed me to identify the completeness of the artifact form, raw materials, and type of lithic tools. This process was designed to determine the kind lithic assemblage in the funerary practice.

The fauna remains identification, done by Rosales, permitted me to identify prehistoric and modern faunal bones. This process allowed me to identify the presence or absence of modern disturbance in the tombs.

The botanical remains analysis permitted me to classify the part of the plants and identify the species. This process allowed me to identify the presence of local plants and plants from other altitudes in the tombs at Hualcayán.

The soil sample analysis was conducted with the goal to find and identify small materials like seeds, beads, and small faunal bones. I used manual flotation because it was easier to set up at Hualcayán. It was time consuming and labor intensive, but inexpensive.

For the human bones analysis, done by Sharp, the MNI calculations were based on long bones and clavicles. Each bone was at least 75% complete and have been sided (left and right). The other MNI calculations were based on either complete crania, or at least 75% complete crania for all tombs.

In the following table, I list the Operation number of the tombs that I have included in this study, as well as their types, locations and dimensions (Table 3 and Figure 5):

Table 3: List of Tombs included in this thesis.

Tomb Operation	**Type of Funerary Context**	**Location**	**Dimension**
Operation 3	Machay	Sector C	$19m^2$
Operation 6	Semi-subterranean tomb	Sector A	$6m^2$
Operation 8	Machay	Sector C	$3m^2$
Operation 11	Machay	Sector C	$36m^2$
Operation 12	Chullpa - Machay	Sector C	$12m^2$
Operation 21	Chullpa	Sector C	$16m^2$

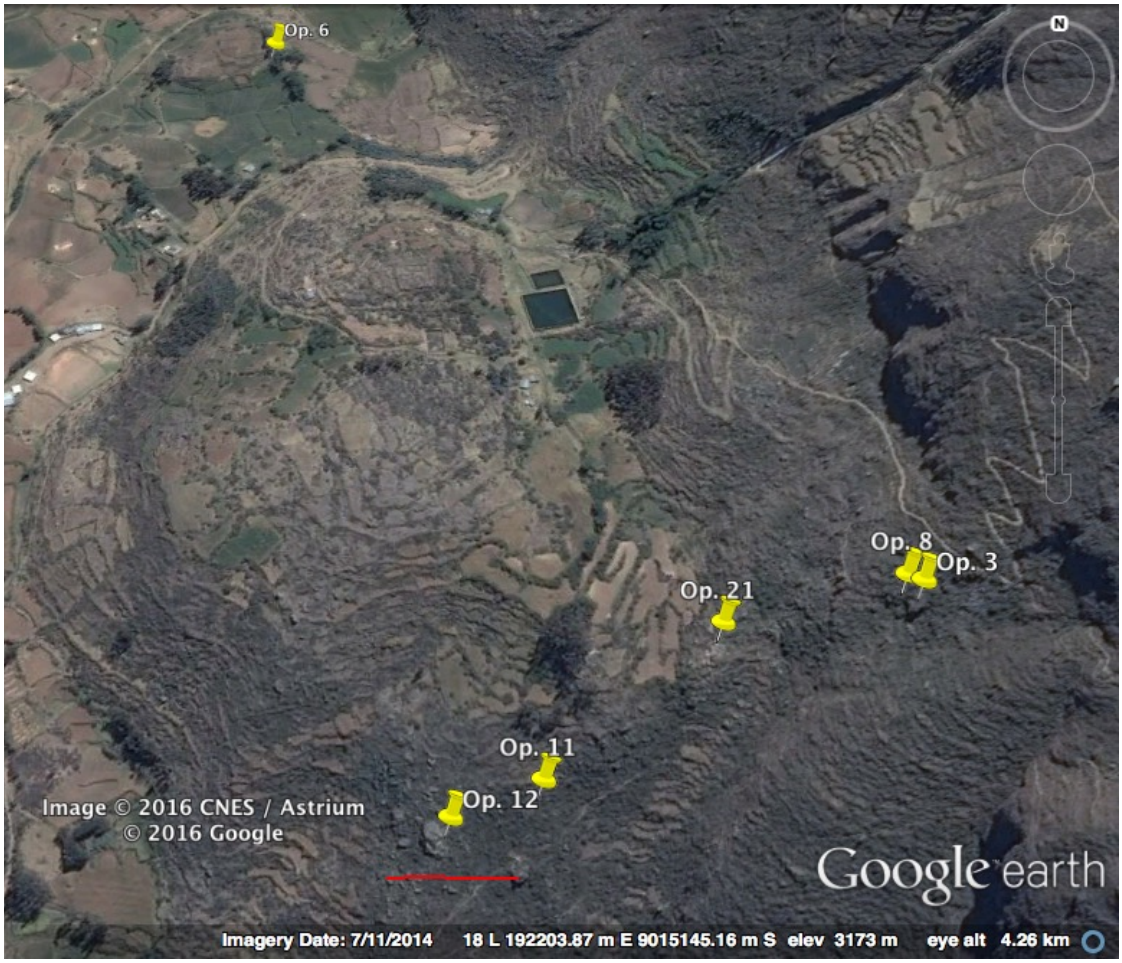

Figure 5. Map with the location of the Tombs 3, 6, 8, 11, 12, and 21.
Original Map from Google Maps, modifications added by the author

6.1. Operation 3

Operation 3 is a *machay* tomb that is located on the west side of the mountain that has several terraces (Figure 6). This *machay* tomb was built around the north and south sides of the rock, but archaeological research has only focused on the four chambers in the southern part of the feature. It is clearly visible that the tomb had more than one floor, probably two. Also, there is a small platform in the south of the tomb. Part of the ceiling and walls of the *machay* tomb have fallen, leaving much debris consisting of large stones. There were different construction episodes in the tomb, specifically in chambers 2, 3, 4 and 5. According to the analysis of ceramics and textiles (Lívora and Bria 2012: 62-69; Gravalos 2014, Pink 2013), this *machay* tomb was used during the Early Intermediate Period (A.D. 1 - 700) and Middle Horizon Period (A.D. 700 - 1000). The area of the *machay* tomb or Operation 3 is 19m^2. There are five chambers in this tomb (Figure 7). The UTM coordinates of the corners of the Operation 3 are WGS84, 192737 E, 9015014 S.

Figure 6. Operation 3, West view. (Lívora and Bria 2012)

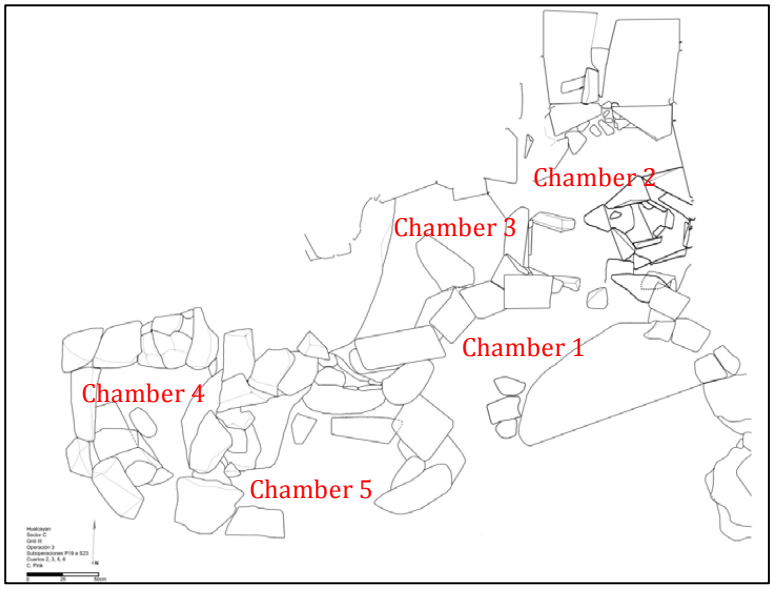

Figure 7. Operation 3, Plan View.
Original Map from Lívora and Bria 2012, modifications added by the author.

The characteristics of cultural features from this tomb are described on Table 4 (Lívora and Bria 2012: 62-65):

Table 4: Cultural features in Operation 3.

Context	Description
C101	Surface layer of the tomb
C102	Layer with rock in the SE corner of the tomb. Southern wall collapsed
C103	Layer of soil with small rocks
C104	Collapsed of the tomb ceiling
C105, C106 and C107	Layer of soil above the floor of the tomb. There are several fragments of bones, ceramics and textiles
C108 and C110	Layer of soil in the NW corner of the tomb
C111 and C112	Layer of ash and rocks in the NW corner of the tomb
C113	Layer with fragments of human bones
C114 and C115	Layer in the SE corner of the tomb. It is a chamber within the tomb
C116 and C117	Layer of soil in the East side of the tomb
C118	Layer with big rocks in the NE corner of the tomb
C119	Floor surface
C120	Layer of soil and rocks. Possible collapsed of a wall
C145 and C152	Layer of soil in the NW corner of the tomb
C146	Layer of soil in the North side of the tomb
C147	Chamber 2
C148	Layer of ash
C149	Layer of lime soil in the NE corner of the tomb
C150 and C151	Layer in the SW corner of the tomb, inside Chamber 2

6.1.1. Cultural Materials in the Operation 3

6.1.1.1. Ceramic Analysis

The ceramic vessel sherd assemblage from this *machay* tomb was noteworthy for the small quantity of 21 decorated sherds. The vessel sherd types are listed on Table 5. Based on the analysis of those sherds, I was able to determine the possible whole shape of the vessel, and the variety of shapes of the vessels is listed on Table 6. The most common decoration techniques are listed on Table 7.

Table 5. Type of Ceramic Sherds in Operation 3.

Vessel Sherd	**QTY**
Complete vessel	3
Rim	6
Body	10
Neck	2
Total	**21**

Table 6. Type of Whole Shape of the Vessels in Operation 3.

Whole Shape of the Vessel	**QTY**
Closed vessel	1
Bowl with flattering lip	1
Pot	2
Large jar	2
Figurine	2
Cup	2
Spoon	2
Unidentified vessel	9
Total	**21**

Table 7. Decoration Techniques of Ceramics in Operation 3.

Decoration Techniques	**QTY**
Absent	5
Incised	4
Stamped	1
Painted	5
Molded	4
Modeled	1

Table 7. Decoration Techniques of Ceramics in Operation 3 (continued).

Decoration Techniques	QTY
Unidentified decoration	1
Total	**21**

The estimated chronological period, determined based on the decorative elements of the sherds in Operation 3, revealed that the tomb was constantly occupied during the Middle Horizon Period (A.D. 700 - 1000) (Table 8).

Table 8. Estimated Chronological Period of Ceramics in Operation 3

Estimated Period	QTY
Unknown	13
Huarás Phase	1
Middle Horizon	6
Late Intermediate Period	1
Total	**21**

Operation 3 suggested that the most common vessels were the pots, large jars, figurines, cups, and spoons; all with either incised or painted decoration from the Middle Horizon Period (A.D. 700 – 1000). These are some examples of ceramic sherds found at Operation 3 (Figure 8):

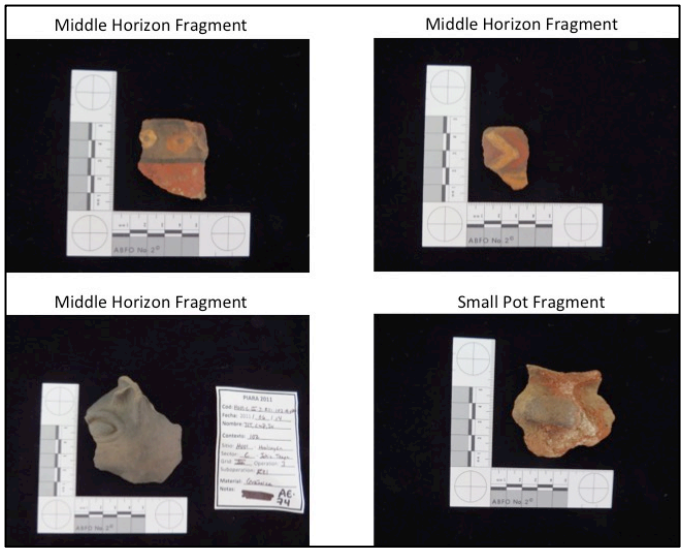

Figure 8. Ceramic Sherds found in Operation 3.

6.1.1.2. Lithic Tools Analysis

The materials found in the *machay* tomb included few lithic artifacts. This section is a general analysis of the type of stone artifacts and the raw material (Table 9). In this tomb, 47 lithic artifacts were analyzed.

Table 9. Lithic Artifacts in Operation 3.

Type	QTY	Raw Material		
		White	Gray	Unidentified
Flakes	15	5	8	2
Debris	26	1	1	24
Cores	3	2	0	1
Uniface	1	0	0	1
Total	**45**	**8**	**9**	**28**

6.1.1.3. Faunal Bones Analysis

Eight hundred and sixty six fragments of faunal bones were found in this tomb. I divide the faunal bones between prehistoric species (792 fragments) (Table 10), and modern species (74 fragments) (Table 11).

Table 10. Classification of Prehistoric Faunal Species in Operation 3.

Species		Common Name	NISP
Prehistoric Faunal Species	*Non identified amphibious*	Amphibious	1
	Nothoprocta sp.	Partridge	1
	Colaptes sp.	Woodpecker	1
	Cairina moschata	Creole duck	1
	Zenaida auriculata	Montera dove	1
	Passeriforme	Bird	1
	Didelphis sp.	Opossum	10
	Non identified chiropteron	Bat	36
	Muridae	Rodent	240
	Felis sp.	Wildcat	1
	Sus scrofa	Wild pig	3
	Artiodactyla	Hoofed mammal	63
	Non identified mammal		433
	Total Prehistoric Species		**792**

Table 11. Classification of Modern Faunal Species in Operation 3.

Species		Common name	NISP
Modern Species	*Rattus rattus*	Rat	72
	Capra hircus	Goat	2
	Total Modern Species		**74**

6.1.1.4. Botanical Remains Analysis

In this section, I list the identified botanical remains found in this *machay* tomb. First, the macro-botanical remains were classified into their parts as follows on Table 12:

Table 12. Classification of Part of Plants in Operation 3.

Part of the Plant	NISP	Weight (g)
Seed	7	1.2
Leaf	26	6.1
Flower	3	0.09
Fruit	27	16.59
Wood	203	108.5
Fiber	16	2.72
Root	1	5.52
Tuber	1	0.41
Bark	19	3.55
Fungus	16	3.07
Total	**319**	**149.75**

Only 95 fragments of plants were identified in this *machay* tomb, including the following species on Table 13 (Figure 9):

Table 13. Plants that were identified in Operation 3.

Identified Plants	Common Name	NISP
Zea mays	Maize	19
Canna sp	Achira	1
Arachis hypagoea	Peanut	6
Lagenaria siceraria	Mate	9
Poaceae	Cane	54
Phaseolous vulgaris	Bean	5

Table 13. Plants that were identified in Operation 3.

Identified Plants	Common Name	NISP
Cucurbita maxima	Pumpkin	1
Unidentified Species	(Stem, root, bark and fungus)	224
Total		**319**

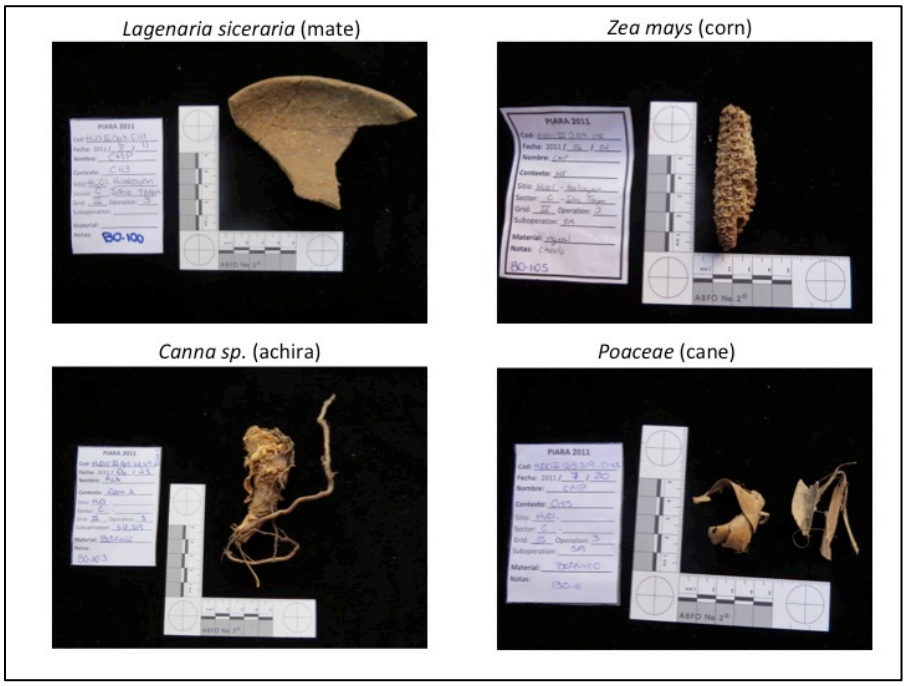

Figure 9: Botanical remains found in Operation 3a.

6.1.1.5. Soil Samples Analysis

I separated the remains recovered from the heavy and the light soil sample. In the heavy soil sample only 11 botanical fragments were identified, while only 35 botanical fragments were identified in the light soil sample. See Table 14 for details.

Table 14. Identified Plants in the Heavy and Light Soil Samples in Operation 3.

Identified Plants	Common Name	Heavy Sample		Light Sample	
		Op. 3		Op. 3	
		NISP	Weight	NISP	Weight
Capsicum sp	Chili	6	0.015	22	0.119

Table 14. Identified Plants in the Heavy and Light Soil Samples in Operation 3 (continued).

Identified Plants	Common Name	Heavy Sample Op. 3		Light Sample Op. 3	
		NISP	Weight	NISP	Weight
Zea mays	Corn	1	0.005	1	0.01
Canna sp	Achira	1	0.985	0	0
Erythroxylon coca	Coca	2	0.02	0	0
Arachis hypagoea	Peanut	1	0.01	2	0.02
Lagenaria siceraria	Mate	0	0	7	0.11
Poaceae	Cane	0	0	2	0.025
Psidium guajava	Guayaba	0	0	1	0.005
Unidentified Fragments		302	31.315	268	13.254
Total		**313**	**32.35**	**303**	**13.543**

Other materials were found in the heavy and light soil samples from this *machay* tomb. See Table 15 for details.

Table 15. Identified Materials in the Heavy and Light Soil Samples in Operation 3.

Identified Materials	Heavy Sample		Light Sample	
	NISP	Weight	NISP	Weight
Ceramics	62	39.73	16	1.455
Animal Bone	55	3.686	133	2.475
Terrestrial Shell	7	0.076	80	0.356
Animal Coprolite	122	2.966	128	1.25
Larva	10	0.305	3	0.73
Mica	0	0	12	0.065
Insect	39	0.58	74	1.045
Thread	11	0.012	19	0.083
Metal	1	0.001	0	0
Finger nail	1	0.01	0	0
Fiber	0	0	1	0.001
Unidentified materials	2	0.13	2	0.03
Total	**310**	**47.496**	**468**	**7.49**

6.1.1.6. Human Bones Analysis

The MNI of human individuals was determined that the bones were at least 75% complete. For the estimation of sex and age of individuals in Operation 3, one of the elements analyzed was the cranium (See Table 16 for results).

Table 16. MNI calculations based on cranial bones in Operation 3.

Cranium Calculations of Sex and Age	MNI
Adult Male	10
Adult probable male	5
Adult female	6
Adult probable female	4
Adult unidentified sex	1
TOTAL	**26 individuals**

Also, for the estimations of age, the MNI analysis was done with the calculations of long bones, in this case the right femur and a complete individual, listed on Table 17.

Table 17. MNI calculations based on long bones and clavicles in Operation 3.

MNI Long Bone Calculations	Op. 3	
	MNI	Element
Adult	33	Right femur + 1 Individual
Sub-adult	16	Multiple bones
TOTAL	**49 individuals**	

6.1.2. Summary of Operation 3

Operation 3 is a large *machay* tomb built around a predominant rock. Such features are presented in other tombs in Sector C (Ichick Tzapa) at Hualcayán. The *machay* tomb is facing the west side of the mountains, featuring plenty of terraces. It is built around the north and south sides of a big rock, but the research was focused on four rooms in the south part of the *machay*. It is evident that this tomb had multiple floors, probably two, but by the process of looting, the exact number cannot be determined. Also, Operation 3 has a small platform on the south of the tomb.

There were different episodes for the construction of the chambers in this tomb. However, the small entrance located on the east side of the tomb allowed individuals to open the semi-subterranean tomb.

The most common vessels identified in this *machay* tomb are pots, large jars, figurines, cups, and spoons; all with either painted or incised decoration. The *machay* was probably used during the Middle Horizon period (700-1000 A.D.) based on the analysis of the ceramic fragments.

About the lithic tools in this tomb, most of these lithic flakes and debris with only one tool present. The raw materials of the artifacts are mostly local rocks. Because of the very limited number of lithic artifacts, no meaningful interpretations of their presence were possible.

The faunal remains identified in this *machay* tomb conclude that most of the species are rodents (probably guinea pigs), non-identified mammals, and non-identified chiropteron (probably bats). A little over 91% of the species are prehistoric faunal species, while 8.55% are modern faunal species.

The species of plants identified during the analysis of botanical remains and soil samples, demonstrate that some of the plants were originally from the local *Quechua* zone (2000 – 3000 masl) such as chili, maize, achira, mate, cane, beans and pumpkin; other plants such as coca, peanut, and guayaba, were from the lower elevation *Yunga* zone (500 – 2000 masl).

Other materials that were found in the soil sample analysis are mostly fragments of ceramics, animal bones, terrestrial shells, animal coprolites, and insects.

The MNI calculations, based on cranial bones used to identify the sex of individuals, demonstrate that 15 individuals were male, 10 individuals were female, and the sex of one individual was unidentified. However, the long bone calculations used to

identify the age of individuals demonstrate that 33 individuals were adults, and 16 individuals were sub-adults.

6.2. Operation 6

Operation 6 is the only excavation unit located in Sector A, which has well-defined funerary architecture (Figure 10). During the excavations in Operation 6, a single semi-subterranean tomb with two chambers was excavated. The area around this tomb was also excavated with the goal to identify the activities associated to the funerary area. The contexts around the tombs are probably related to funerary activities, including proveniences both inside and outside the tombs, and included large broken vessels, musical instruments, botanical and faunal remains (Lívora and Bria 2012: 82-99).

The UTM coordinates of one of the corners of Operation 6 are WGS84, 192259 E, 9015685 S (Figure 11).

Figure 10. Operation 6, Plant View (Lívora and Bria, 2012: 89).

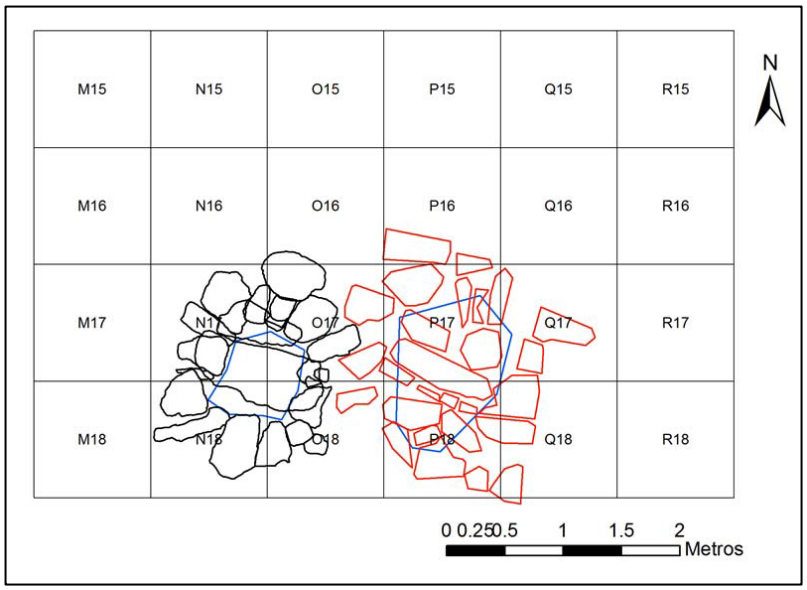

Figure 11. Operation 6, Plan View (Lívora and Bria, 2012: 90).

The characteristics of cultural features from this tomb are described on Table 18 (Lívora and Bria 2012: 83-87):

Table 18: Cultural features in Operation 6.

Context	Description
C202	Superficial layer
C203	Layer with abundant cultural materials
C205	Lintel of the East tomb. The lintel is a big slab of rock
C207 and C218	Layer of soil at the interior of the tombs with abundant human bones
C209	Layer of mortar used to build the ceiling of the tombs
C213	Lintel of the West tomb. The lintel is a big slab of rock
C219	Thin feature of ash. This feature is associated with fragmented human bones
C220 and C240	Surface layer of the West tomb
C221	Feature with concentrated ceramic sherds in the North and West part of the tomb
C222	Layer of mortar used to build the ceiling of the West tomb
C223	Concentration of human bones in the East tomb
C224	Concentration of ceramic sherd in the West tomb
C227, C232 and C241	Surface in the East tomb. This layer is associated with abundant human bones and ceramics
C230 and C235	Surface of the West tomb with abundant small rocks
C234 and C238	Access between the East and West tombs
C236	Concentration of abundant ceramic sherds in the East tomb
C603	Feature in East tomb with several ceramic sherds
C607	Part of the ceiling of the East tomb

Table 18: Cultural features in Operation 6 (continued).

Context	Description
C616	Feature of soil with mortar in the East tomb

6.2.1. Cultural Materials in the Operation 6

6.2.1.1. Ceramic Analysis

The ceramic vessel sherd assemblage from Operation 6 excavation was noteworthy for the small quantity of 15 decorated sherds. The vessel sherds types are listed on Table 19. Based on the analysis of those sherds, I was able to determine the possible whole shape of the vessel, and the variety of shapes is listed on Table 20. The most common decoration techniques are listed on Table 21.

Table 19. Type of Ceramic Sherds in Operation 6.

Vessel Sherds	QTY
Complete vessel	1
Rim	2
Body	10
Base	1
Neck	1
Total	**15**

Table 20. Type of Whole Shape of the Vessels in Operation 6.

Whole Shape of the Vessel	QTY
Open vessel	1
Unidentified vessel	14
Total	**15**

Table 21. Decoration Techniques of Ceramics in Operation 6.

Decoration Techniques	QTY
Absent	9
Incised	3
Painted	3
Total	**15**

The estimated chronological period determined based on the decorative elements of the ceramic sherds in Operation 6, shows evidence that this tomb was constantly occupied during the Early Intermediate Period (A.D. 0 - 700), listed on Table 22.

Table 22. Estimated Chronological Period of Ceramics in Operation 6.

Estimated Period	**QTY**
Unknown	4
Early Horizon Period	3
Early Intermediate Period	8
Total	**15**

Operation 6 suggested that there are not similar type of vessels, with painted and incised decoration, from the Early Intermediate Period (1 – 700 A.D.) (Table 24). These are some examples of ceramic sherds found at Operation 3 (Figure 12):

Figure 12. Ceramic Sherds found in Operation 6.

6.2.1.2. Lithic Analysis

The materials found in the semi-subterranean tomb included some lithic artifacts. A general analysis of the type of stone artifacts and the raw material is presented (Table 23). In this tomb, 56 lithic artifacts were analyzed.

Table 23. Lithic Artifacts in Operation 6.

Type	QTY	Raw Material		
		White	Gray	Unidentified
Flakes	36	3	6	27
Debris	18	1	1	16
Cores	12	0	0	12
Biface	1	0	0	1
Total	**67**	**4**	**7**	**56**

6.2.1.3. Faunal Bones Analysis

In this section, I list the faunal bones identified in Operation 6. Three hundred fifty one fragments of faunal bones were found in this tomb. I divide the faunal bones between prehistoric species (344 fragments) (Table 24) and modern species (7 fragments) (Table 25).

Table 24. Classification of Prehistoric Faunal Species identified in Operation 6.

Species		Common name	NISP
Prehistoric Species	*Bufo sp.*	Amphibian anuro	2
	Non identified amphibious	Amphibious	1
	Passeriforme	Bird	3
	Non identified bird	Bird	63
	Non identified chiropteron	Bat	16
	Muridae	Rodent	13
	Agouti sp.	Pacas	1
	Felis sp.	Wildcat	33
	Non identified carnivorous		4
	Sus scrofa	Wild pig	25
	Artiodactyla	Hoofed mammal	7
	Non identified mammal		176
	Total Prehistoric Species		**344**

Table 25. Classification Modern Faunal Species identified in Operation 6.

Species		Common name	NISP
Modern Species	*Gallus gallus*	Bankiva rooster	2
	Rattus rattus	Rat	5
	Total Modern Species		**7**

6.2.1.4. Botanical Remains Analysis

In this section, I list the identified botanical remains found in the Operation 6. First, the macro-botanical remains in Operation 6 were classified into their parts as follows on Table 26:

Table 26: Classification of Part of Plants in Operation 6.

Part of Plant	NISP	Weight
Seed	10	0.545
Flower	5	0.1
Fruit	1	0.115
Wood	15	3.56
Tuber	1	4.124
Carbon	95	23.87
Total	**127**	**32.314**

Only one fragment (4.124g) was identified in Operation 6, because 86.15% of the sample was charcoal fragments. The botanical remains are fragments of *Canna sp.* (achira) (Figure 13).

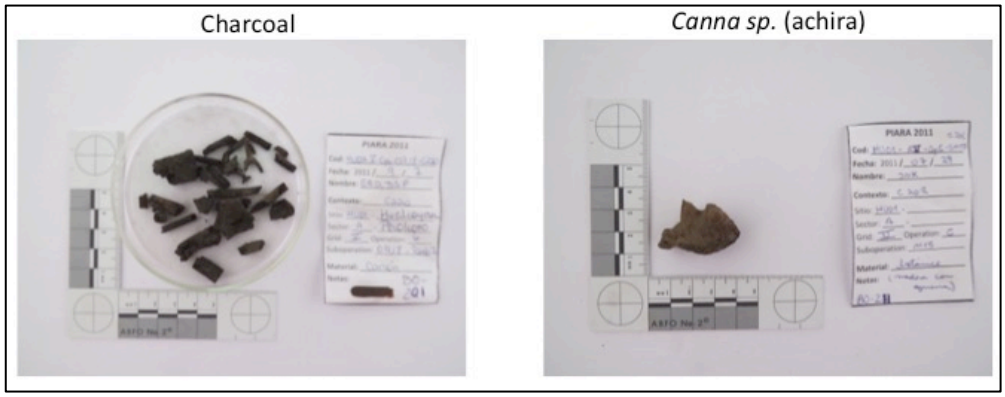

Figure 13. Botanical Remains identified in Operation 6.

6.2.1.5. Soil Samples Analysis

I separated the remains recovered from the heavy and the light soil sample. In the heavy soil sample only 5 botanical fragments were identified, while in the light soil sample only 8 botanical fragments were identified. See Table 27 for details

Table 27. Identified Plants in the Heavy and Light Soil Samples in Operation 6.

Identified Plants	**Heavy Sample**		**Light Sample**	
	Op. 6		**Op. 6**	
	NISP	**Weight**	**NISP**	**Weight**
Capsicum sp	3	0.07	7	0.05
Arachis hypagoea	1	0.015	1	0.01
Poaceae	1	0.055	0	0
Unidentified Plants	50	5.831	318	5.091
Total	**55**	**5.971**	**326**	**5.151**

There were other materials found in the heavy and light soil samples from Operation 6. See Table 28 for details.

Table 28. Identified Materials in the Heavy and Light Soil Samples in Operation 6.

Identified Materials	**Heavy Sample**		**Light Sample**	
	Op. 6		**Op. 6**	
	NISP	**Weight**	**NISP**	**Weight**
Ceramics	154	180.1	39	3.72
Animal Bone	160	17.09	184	7.77
Terrestrial Shell	47	7.15	101	3.905
Animal Coprolite	55	5.64	53	14.79
Insect	1	0.805	0	0
Clay	3	0.23	0	0
Kaolin	0	0	5	0.175
Total	**420**	**211.015**	**382**	**30.36**

6.2.1.6. Human Bones Analysis

The MNI of human individuals was determined that the bones were at least 75% complete. For the estimation of sex and age of individuals in Operation 6, one of the elements analyzed was the cranium (See Table 29 for results).

Table 29. MNI calculations based on cranium bones in Operation 6.

Cranium calculations of Sex and Age	MNI
Subadult	5
Adult male	2
Adult probable male	1
Adult unidentified sex	1
TOTAL	**9**

Also, for the estimations of age, the MNI analysis was done with the calculations long bones, in this case the left femur (Table 30).

Table 30. MNI calculations based on long bones in Operation 6.

MNI Long Bone Calculations	Op. 6	
	MNI	Element
Adult	5	Left Femur
Sub-adult	4	Left Femur
TOTAL	**9 individuals**	

6.2.2. Summary of Operation 6

The operation unit 6 is a located in Sector A. During the excavations in this semi-subterranean tomb, it was possible to identify two connected chambers. Also, various contexts located around these tombs were found, which were associated directly with the tomb. This area was in constant activity probably because the ancestor veneration practices were conducted around the tomb.

There was one construction episode in this tomb and for the construction of the chambers. However, the small entrance located in the east side of the tomb, allowed individuals to open the semi-subterranean tomb.

The most common vessels identified in this semi-subterranean tomb were open vessels and unidentified vessels. Most of the ceramic sherds were body sherds with incised and painted decoration. Based on the analysis of the ceramic sherds, the semi-

subterranean tomb was used probably used during the Early Intermediate Period, and was associated with the Recuay culture (A.D. 250 -700).

Most of the lithic artifacts in this tomb are incomplete, possessing between 25% to 75% completion. The raw materials of these tools are mostly local rocks. Because of the very limited number of lithic artifacts, no meaningful interpretation of their presence was possible.

The faunal remains identified in this semi-subterranean tomb demonstrated that most of the species were non-identified birds, wildcats, and non-identified mammals. A little over ninety eight percent of the species are prehistoric, while 1.99% are modern species.

The species of plants identified during the analysis of botanical remains and soil samples demonstrated that all plants were originally from the local *Quechua* zone (2000 – 3000 masl). Eighty six percent of the botanical remains were burned; for that reason, it was challenging to identify the species.

Other materials that were found in the soil sample analysis were mostly fragments of ceramics, animal bones, terrestrial shells, and animal coprolites.

The MNI calculations based on cranial bones to identify the sex of individuals demonstrated that 5 individuals were sub-adults, 2 individuals were male adults, 1 individual was probably male adult, and the sex of one individual was unidentified. No female individuals were identified in this tomb. However, the long bone calculations to identify the age of individuals demonstrated that 5 individuals were adult, and 4 individuals were sub-adults.

6.3. Operation 8

Operation 8 is located north of the Operation 3. Operation 8 was a *machay* type tomb (Figure 14). During the excavation of the tomb, a large number of human bones were recovered, as well as cultural and disturbed materials (Lívora and Bria 2012: 107-109; Witt, 2012). Only a few contexts were excavated. This *machay* was an urgent rescue excavation, because looters destroyed most of the evidence in the past. The UTM coordinates of one of the corners of the Operation 8 are WGS84, 192728 E, 9015021 S.

Figure 14. Operation 8, West view (Lívora and Bria, 2012: 108).

The characteristics of cultural features from this tomb are described on Table 31 (Lívora and Bria 2012: 107):

Table 31: Cultural features in Operation 8.

Context	Description
C251	Surface layer
C252	Materials on the surface of the tomb
C253	Sub-adult mummy bundle
C254 and C255	Layer of soil with human bones, ceramic sherds and botanical remains

6.3.1. Cultural Materials in the Operation 8

6.3.1.1. Ceramic Analysis

Only one diagnostic ceramic sherd was found during the excavations in Operation 8 tomb. Significant characteristics include:

- The ceramic sherd is part of a vessel body. Because of the poor preservation of the sherd; it is unknown the estimated period.
- According to the whole shape of the vessel, the sherd is part of an open vessel.
- The ceramic sherd was elaborated with the modeled technique.
- The sherd was oxidized during the firing technique.
- The sherd had painted decoration by using two different colors.

Figure 15. Ceramic Sherd found in Operation 8.

6.3.1.2. Lithic Tools Analysis

This section is a general analysis of the type of stone artifacts and the raw material (Table 32). In this *machay* tomb, only 3 lithic artifacts were recovered and analyzed.

Table 32. Lithic Artifacts in Operation 8.

Type	QTY	Raw Material		
		White	Gray	Unidentified
Flakes	3	0	0	3
Total	**3**	**0**	**0**	**3**

6.3.1.3. Faunal Bones Analysis

In this section, I list the faunal bones identified in Operation 8. One hundred and sixty six fragments of faunal bones were found in this tomb. Only prehistoric species (166 fragments) (Table 33) were found in this tomb.

Table 33. Classification of Prehistoric Faunal Species in Operation 8.

Species		Common Name	NISP
Prehistoric Species	*Passeriforme*	Bird	11
	Muridae	Rodent	56
	Cavia porcellus	Guina pig	71
	Lagidium peruanum	"Vizcacha norteña"	21
	Lama sp.	Llama	2
	Non identified mammal		5
	Total Prehistoric Species		**166**

6.3.1.4. Botanical Remains Analysis

In this section, I list the identified botanical remains found in Operation 8. First, the macro-botanical remains in Operation 8 were classified into their parts as follows on Table 34:

Table 34. Classification of Part of Plants in Operation 8.

Part of the Plant	NISP	Weight
Seed	1	0.99
Leaf	5	2
Fruit	30	10.34
Wood	100	393.02
Fiber	231	474.71
Root	13	84
Total	**380**	**965.06**

One hundred and fifty four fragments of plants were identified in this tomb (Figure 16), including the following listed on Table 35:

Table 35. Plants that were identified in Operation 8.

Identified Materials	NISP	Weight
Zea mays	2	1
Arachis hypagoea	1	1
Lagenaria siceraria	4	4.97
Poaceae	114	84.69
Stipa ichu	12	83
Persea americana	21	2.36
Unidentified Plants	226	719.73
Total	**380**	**896.75**

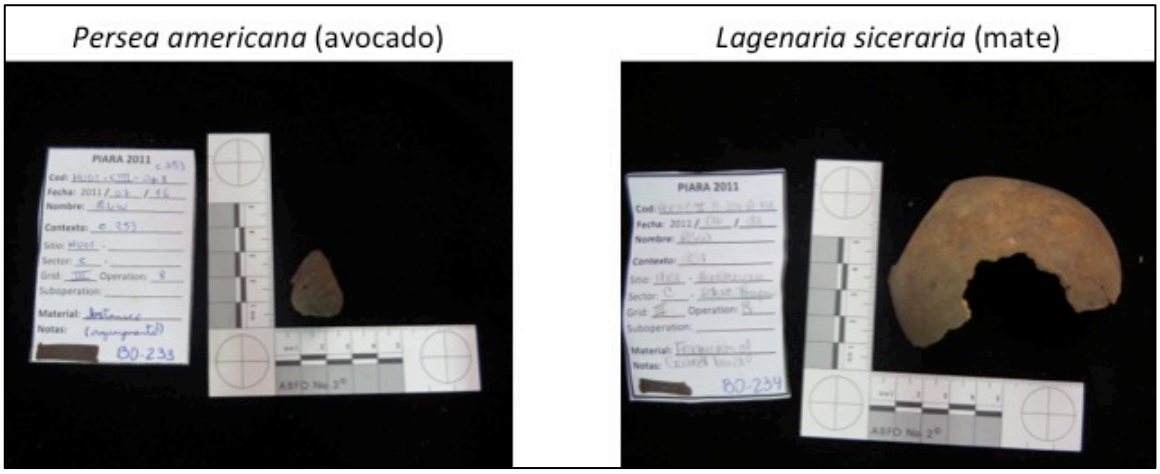

Figure 16. Botanical Remains identified in Operation 8.

6.3.1.5. Human Bones Analysis

The MNI of human individuals was determined that the bones were at least 75% complete. For the estimation of sex and age of individuals in Operation 8, one of the elements analyzed was the cranium (See Table 36).

Table 36. MNI calculations based on cranial bones in Operation 8.

Cranium Calculations of Sex and Age	MNI
Sub-adult	4
Adult male	5
Adult probable male	1
Adult female	3
Adult probable female	1
Adult unidentified sex	0
TOTAL	**14**

Also, for the estimations of age, the MNI analysis was done with the calculations of long bones, in this case left femur (Table 37).

Table 37. MNI calculations based on long bones in Operation 8.

MNI Long Bone Calculations	Op. 6	
	MNI	Element
Adult	8	Left Femur
Sub-adult	4	Left Femur
TOTAL	**12 individuals**	

6.3.2. Summary of Operation 8

This *machay* was looted before the excavations. There were human bones lying on the outside of the *machay*. Fortunately, a complete mummy bundle was found near the entrance of the tomb.

The only ceramic sherd found in this tomb corresponds to a decorated body fragment with poor preservation; it was used during the Middle Horizon Period (700 – 1000 A.D.). It was probably part of a figurine and it was painted with black lines.

Three lithic tools were recovered. The raw material for these three tools is a slate-like rock. Because of the very limited number of lithic artifacts, no meaningful interpretations of their presence were possible.

The faunal remains identified in this *machay* determine that most of the species were rodents, guinea pig, and *vizcacha norteña.* All the species found in this tomb were prehistoric faunal species.

The species of plants identified during the analysis of botanical remains demonstrated that most of the plants were originally from the local *Quechua* zone (2000 – 3000 masl). Examples of these plants are maize, peanut, mate, cane, and ichu. Another plant that was from the lower elevation *Yunga* zone (500 – 2000 masl) was avocado.

The MNI calculations based on the cranial bones to identify the sex of the individuals revealed that 4 individuals were sub-adult, 5 male adults, 1 probable male adult, 3 female adults, and 1 probable female adult. However, the long bone calculations that were used to identify the age of individuals demonstrated that 8 individuals were adults, and 4 individuals were sub-adults

6.4. Operation 11

Operation 11 (Figure 17) was an excavation unit that has the characteristics of a *machay* tomb. This *machay* tomb has a curved wall built under a big rock. During the excavation of this tomb, several human bones were found, as well as other cultural materials like ceramics, textiles and botanical remains. The front entrance of this *machay* was destroyed. However, there is a main chamber next to the entrance that contained most of the artifacts (Lívora and Bria 2013: 75-79). The UTM coordinates of one of the corners of the Operation 8 are WGS84, 192462 E, 9014894 S.

Figure 17. Operation 11, West View (Lívora and Bria, 2013: 79).

The area of this *machay* tomb is 11m^2. The layers found during the excavation of this tomb are described as follows on Table 38 (Lívora and Bria 2012):

Table 38: Cultural features in Operation 11.

Context	Description
C701	Superficial layer inside the tomb with fragments of human bones
C702	Superficial layer outside the tomb
C703	Layer with large rocks
C704 and C707	Layer with large rocks from collapsed walls
C705	Layer with abundant organic materials
C706	Layer of soil from collapsed walls
C708	Wall inside the tomb
C709	Layer of soil with abundant materials
C710	Layer with rocks

6.4.1. Cultural Materials in the Operation 11

6.4.1.1. Ceramic Analysis

The ceramic vessel sherd assemblage from the Operation 11 excavation was noteworthy for the small quantity of 8 decorated sherds. The vessel sherd types are listed on Table 39. Based on the analysis of those sherds, I was able to determine the possible whole shape of the vessel, and the variety of shapes of the vessels is listed on Table 40. The most common decoration techniques are listed on Table 41.

Table 39. Type of Ceramic Sherds in Operation 11.

Vessel Sherd	QTY
Complete vessel	1
Rim	3
Body	4
Total	**8**

Table 40. Type of Whole Shape of the Vessel in Operation 11.

Whole Shape of the Vessel	QTY
Closed vessel	2
Unidentified vessel	6
Total	**8**

Table 41. Decoration Techniques of Ceramics in Operation 11.

Decoration Techniques	QTY
Absent	3
Painted	5
Total	**8**

The estimated chronological period was determined based on the decorative elements of the ceramic sherds in Operation 11, evidence that the tomb was constantly occupied during the Huarás Phase Period (A.D. 1 - 200) (Table 42).

Table 42. Estimated Chronological Period of Ceramics in Operation 11.

Estimated Period	QTY
Unknown	2
Huarás Phase	4
Early Intermediate Period	2
Total	**8**

Operation 11 suggests that the most common vessels are the closed vessels; with painted decoration, from the Huarás Phase (A.D. 1 - 200). This is one example of ceramic sherd found in Operation 11.

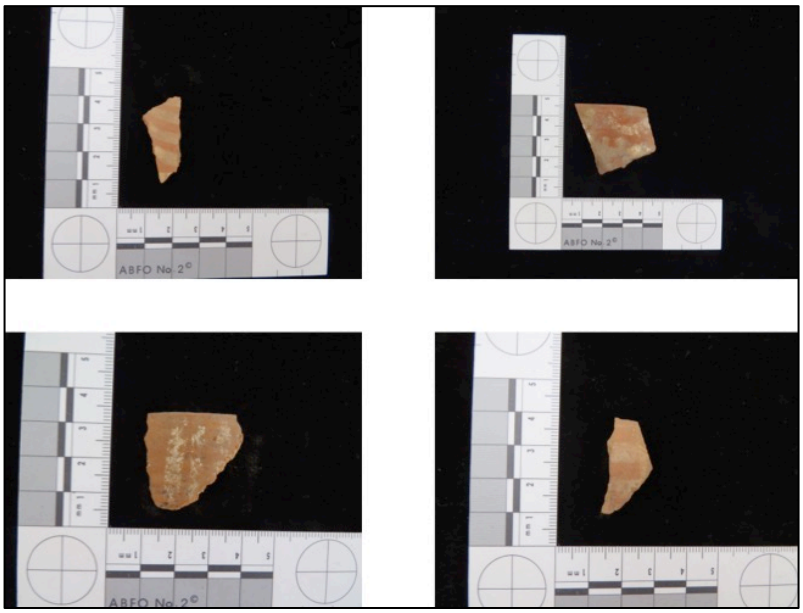

Figure 18. Ceramic Sherds found in Operation 11.

6.4.1.2. Lithic Tools Analysis

The materials found in the *machay* tomb included few lithic artifacts. This section is a general analysis of the type of stone artifacts and the raw material (Table 43). In this tomb, only 3 lithic artifacts were recovered and analyzed.

Table 43. Completeness of Lithic Tools in Operation 11.

Type	QTY	Raw Material		
		White	Gray	Unidentified
Debris	2	0	2	0
Uniface	1	0	1	0
Total	**3**	**0**	**3**	**0**

6.4.1.3. Faunal Bones Analysis

In this section, I list the faunal bones identified in Operation 11. Two hundred and eighty three fragments of faunal bones were found in this tomb. I divide the faunal bones between prehistoric species (273 fragments) (Table 44) and modern species (10 fragments) (Table 45).

Table 44. Classification of Prehistoric Faunal Species in Operation 11.

Species		Common name	NISP
Prehistoric Species	*Nothoprocta sp.*	Partridge	1
	Cairina moschata	Creole duck	1
	Non identified bird	Bird	24
	Lonchophylla sp.	Bat	1
	Muridae	Rodent	74
	Cavia porcellus	Guina pig	69
	Lagidium peruanum	"Vizcacha norteña"	47
	Lama sp.	Llama	2
	Non identified mammal		54
	Total Native Species		**273**

Table 45. Classification of Modern Faunal Species in Operation 11.

Species		Common name	NISP
Modern Species	*Gallus gallus*	Bankiva rooster	8
	Capra hircus	Goat	1
	Ovis aries	Sheep	1
	Total Non Native Species		**10**

6.4.1.4. Botanical Remains Analysis

In this section, I list the identified botanical remains found in the Operation 11. First, the macro-botanical remains in this *machay* tomb were classified into their parts as follows on Table 46:

Table 46. Classification of Parts of Plants in Operation 11.

Part of the Plant	NISP	Weight
Leaf	5	3.655
Flower	2	0.96
Fruit	23	3.705
Wood	16	11.13
Fiber	18	186.8
Root	1	2.485
Total	**65**	**208.735**

Only 28 fragments of plants were identified in this tomb, including the following plants on Table 47:

Table 47. Plants that were identified in the Operation 11.

Identified Materials	NISP	Weight
Zea mays	3	5.72
Canna sp	1	2.485
Lagenaria siceraria	22	3.685
Poaceae	1	1.89
Tillandsia landbeckii	1	0.33
Unidentified Plants	37	194.625
Total	**65**	**208.735**

6.4.1.5. Soil Samples Analysis

I separated the remains recovered from the heavy and the light soil sample. In the heavy sample only 26 botanical fragments were identified, while only 11 botanical fragments were identified in the light soil sample. See Table 48 for details.

Table 48. Identified Plants in the Heavy and Light Soil Samples in Operation 11.

Identified Materials	Heavy Sample Op. 11		Light Sample Op. 11	
	NISP	Weight	NISP	Weight
Capsicum sp	9	0.002	7	0.022
Arachis hypagoea	4	0.285	1	0.01
Lagenaria siceraria	2	0.04	0	0
Poaceae	2	0.01	2	0.025
Stipa ichu	8	0.17	0	0
Tillandsia landbeckii	1	5.16	0	0
Psidium guajava	0	0	1	0.005
Unidentified Plants	109	20.182	158	3.025
Total	**135**	**25.849**	**169**	**3.087**

Other materials found in the heavy and light soil samples from Operation 11 are noted below in Table 49.

Table 49. Identified Materials in the Heavy and Light Soil Samples in Operation 11.

Identified Materials	Heavy Sample Op. 11		Light Sample Op. 11	
	NISP	Weight	NISP	Weight
Ceramics	2	0.49	0	0
Animal Bone	45	6.8	58	1.275
Terrestrial Shell	16	10.75	1	0.01
Animal Coprolite	119	1.6	184	9.651
Larva	2	0.565	2	0.76
Insect	4	0.146	4	0.676
Thread	1	0.001	0	0
Finger nail	1	0.01	0	0
Skin	2	0.015	0	0
Unidentified materials	1	0.01	0	0
Total	**193**	**20.387**	**249**	**12.372**

6.4.1.6. Human Bones Analysis

The MNI of human individuals was determined that the bones were at least 75% complete. For the estimation of sex and age of individuals in Operation 11, one of the elements analyzed was the cranium (See Table 50).

Table 50. MNI calculations based on cranial bones in Operation 11.

Cranium calculations of Sex and Age	MNI
Sub-adult	1
Adult male	7
Adult probable male	1
Adult female	2
Adult probable female	0
Adult unidentified sex	0
TOTAL	**11**

Also, for the estimations of age, the MNI analysis was done with the calculations of long bones, in this case left femur (Table 51).

Table 51. MNI calculations based on long bones in Operation 11.

MNI	Op. 11	
Long Bone Calculations	MNI	Element
Adult	10	Left Femur
Sub-adult	4	Left Femur
TOTAL	**14 individuals**	

6.4.2. Summary of Operation 11

Operation 11 corresponds to the excavation of a tomb, facing northeast. This tomb is a *machay* type, and is located under a large rock. This tomb was looted and parts of the walls of the tomb were destroyed. One of the burial chambers is 50cm by 100cm**.**

The most common vessels identified in this *machay* were closed vessels; with painted decoration. Based on the analysis of the ceramic sherds, this *machay* was probably used during the Early Intermediate Period (A.D. 1 – 700).

Only three lithic artifacts were recovered in Operation 11. The raw materials of these tools are mostly local rocks. Because of the very limited number of lithic artifacts, no meaningful interpretations of their presence were possible.

The faunal remains identified in this *machay* indicate that most of the species were guinea pig, *vizcacha norteña*, and non-identified mammals. A little over ninety six percent of the species were prehistoric faunal species, while 3.53% were modern faunal species.

The species of plants identified during the analysis of botanical remains and soil samples demonstrate that some of the plants were originally from the local *Quechua* zone (2000 – 3000 masl). This includes maize, achira, mate, cane, tillandsia, peanut, and ichu. Another plant, the guayaba fruit, was from the lower elevation *Yunga* zone (500 – 2000 masl).

Other materials that were found in the soil sample analysis were mostly fragments of animal bones, terrestrial shells, and animal coprolites.

The MNI calculations based on cranial bones to identify the sex and age of individuals demonstrate that 1 individual was sub-adult, 7 individuals were male adults, 1 individual was probable male adult, and 2 individuals were female adults. However, the long bone calculations used to identify the age of the individuals demonstrate that 10 individuals were adults, and 4 individuals were sub-adults.

6.5. Operation 12

Operation 12 (Figure19) is located on the southwest part of Sector C. This operation is a tomb designated as *chullpa-machay* because there is *chullpa* structure inside the cave. The tomb has a major chamber under a large rock (Chamber B), with a larger rectangular chamber (Chamber A), that was built in front of the major chamber of the *machay*. This tomb was intensely looted because the artifacts were found disturbed inside and outside of the tomb. Ceramics, botanical remains, textiles, and human bones from several individuals were found, including adults and sub-adults. A mummy bundle was found in in Chamber A, however most of the textiles from this mummy bundle were missing from looting. According to the bioarchaeological studies, the mummy belongs to a female individual of 50 to 70 years old (Lívora and Bria 2013: 80-83). One of the UTM coordinates of this tomb is WGS84, 192391 E, 9014866 S

Figure 19. Operation 12 (Lívora and Bria, 2013: 81).

The area of this *chullpa-machay* tomb is 12m^2. Only two cultural features were described during the excavations of this tomb (Lívora and Bria 2013) (Table 52)

Table 52: Cultural features in Operation 12.

Context	Description
Chamber A	Chullpa
Chamber B	Machay

6.5.1. Cultural Materials in the Operation 12

6.5.1.1. Ceramic Analysis

Only one diagnostic ceramic sherd was found during the excavations in Operation 12. Significant characteristics include:

- The ceramic fragment is part of a rim sherd. The shape of the vessel cannot be determined. Because of the poor preservation of the sherd, it is unknown the estimated period.
- The ceramic sherd was elaborated with the modeled technique, and the paste color of the sherd is dark grey.
- The sherd was oxidized during the reduced technique.
- The decoration technique is engraving.

6.5.1.2. Lithic Tools Analysis

No lithic artifacts were recovered in this tomb.

6.5.1.3. Faunal Bones Analysis

In this section, I list the faunal bones identified in Operation 12. Two hundred and thirty fragments of faunal bones were found in this tomb. I divide the faunal bones between prehistoric species (220 fragments) (Table 53) and modern species (10 fragments). The native faunal bones recovered in Operation 12 are as follows:

Table 53. Classification of Prehistoric Faunal Species in Operation 12.

Prehistoric Species		Common name	NISP
Prehistoric Species	*Non identified amphibious*	Amphibious	6
	Passeriforme	Bird	21
	Muridae	Rodent	30
	Cavia porcellus	Guina pig	93
	Lagidium peruanum	"Vizcacha norteña"	56
	Lama sp.	Llama	4
	Odocoileus virginianus	White-tailed deer	6
	Non identified mammal		4
	Total Native Species		**220**

The only modern faunal bones found in Operation 12 were 10 fragments of *Rattus rattus* (rat).

6.5.1.4. Botanical Remains Analysis

In this section, I list the identified botanical remains found in the Operation 12. First, the macro-botanical remains in Operation 12 were classified into their parts as follows (Table 54):

Table 54. Classification of Part of Plants in Operation 12.

Part of the Plant	NISP	Weight
Leaf	16	2.69
Flower	29	21.46
Fruit	39	83.165
Wood	255	2225.52
Fiber	118	457.21
Root	49	41.4
Complete Plant	4	114.025
Carbon	1	0.775
Cactus	1	2
Unidentified	1	1.06
Total	**513**	**2949.305**

Two hundred and eighty three fragments of plants were identified in this tomb, including the plants on Table 55.

Table 55. Plants identified in Operation 12.

Identified Materials	NISP	Weight
Zea mays	20	78.92
Canna sp	13	6
Lagenaria siceraria	19	19.67
Poaceae	186	262
Stipa ichu	37	57.83
Tillandsia landbeckii	4	94.3
Agave americana	3	8.8
Cucurbita maxima	1	4
Unidentified Plants	220	2417.765
Total	**513**	**2949.285**

6.5.1.5. Human Bones Analysis

The MNI of human individuals was determined that the bones were at least 75% complete. For the estimation of sex and age of individuals in Operation 12, one of the elements analyzed was the cranium (Table 56). For the estimations of age, the MNI analysis was done with the calculations of long bones, in this case left tibia (Table 57).

Table 56. MNI calculations based on cranial bones in Operation 12.

Cranium calculations of Sex and Age	MNI
Sub-adult	3
Adult male	10
Adult female	11
Adult probable female	1
TOTAL	**25**

Table 57. MNI calculations based on long bones in Operation 12.

MNI Long Bone Calculations	MNI	Element
Adult	19	Left Tibia
Sub-adult	6	Left Tibia
TOTAL	**25 individuals**	

6.5.2. Summary of Operation 12

This tomb has an intense activity of desecration, because many human bones were found in the entrance of the tomb. Fortunately, a complete mummified individual was found in the Chamber A, Section 3. The bundle was open, but the only thing that could be determined was that the individual was a woman between 50 to 70 years old.

Only one diagnostic ceramic sherd was found during the excavations of Operation 12. This sherd was part of a rim, with engraved decoration, and was made by the modeled technique.

The faunal remains identified in this *machay* indicate that most of the species were rodents, guinea pig, and *vizcacha norteña.* A little over of ninety five percent of the species were prehistoric faunal species, while 4.35% were modern faunal species.

The species of plants identified during the analysis of botanical remains demonstrate that some of the plants were originally from the local *Quechua* zone (2000 – 3000 masl). Examples of these plants are maize, achira, mate, cane, ichu, tillandsia, and pumpkin. Another plant that was from lower elevation *Yunga* zone (500 – 200 masl) was avocado.

The MNI calculations that were based on cranial bones to identify the sex of individuals demonstrated that 3 individuals were sub-adult, 10 were male adults, 11 female adults, and 1 probable female adult. However, the long bone calculations used to identify the age of individuals demonstrated that 19 individuals were adults, and 6 individuals were sub-adults.

6.6. Operation 21

The excavation of the Operation 21 (Figure 20) is located within a *chullpa* located in the Sector C. This *chullpa* was divided into four chambers A, B, C and D; which in turn they were divided into smaller arbitrary rectangles (A1, A2, etc.), depending on the shape and size of the particular chamber and quantity of findings that were recovered. This *chullpa* had already been partially looted, so that the materials were recovered gives us only partial information about funeral practices that were practiced during the Middle Horizon Period in Hualcayán (Cruzado and Bria 2014). The UTM coordinates of one of the corners of this *chullpa* are WGS84, 192603 E, 9015007 S.

Figure 20. Operation 21, West View (Cruzado and Bria, 2014).

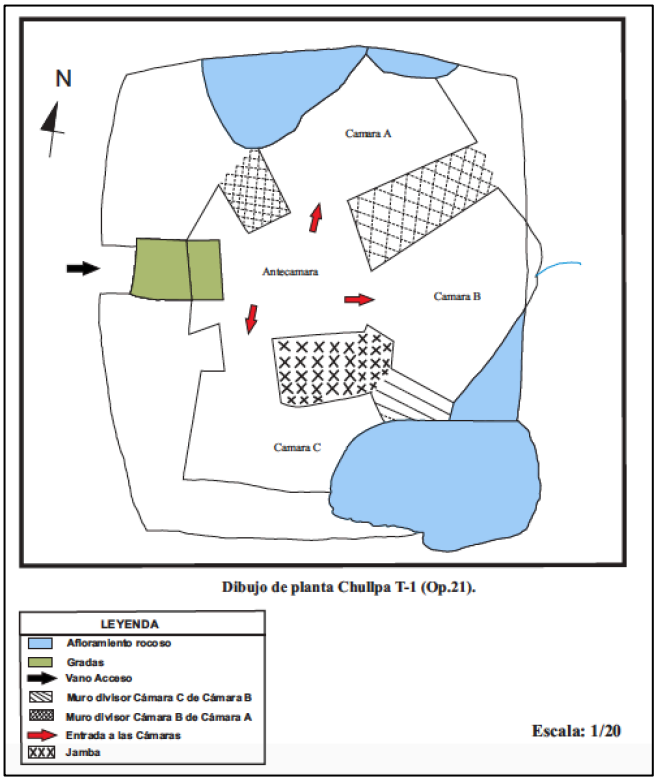

Figure 21: Operation 21, Plan View (Gómez 2015).

The area of this *chullpa* tomb is 16m^2. The layers found during the excavation of this tomb are as follows (Cruzado and Bria 2014) (Table 58):

Table 58: Cultural features in Operation 21.

Context	Description
C1451	Floor of the tomb
C1452	Layer underneath the floor of the tomb

6.6.1. Cultural Materials in the Operation 21

6.6.1.1. Ceramic Analysis

The ceramic vessel sherd assemblage from Operation 21 excavation was of 92 ceramic diagnostic sherds. The vessel sherd types are listed on Table 59. Based on the analysis of those sherds, I was able to determine the possible whole shape of the vessel,

and the variety of the vessels is listed on Table 60. The most common decoration techniques are listed on Table 61.

Table 59. Type of Ceramic Sherds in Operation 21.

Vessel Sherd	**QTY**
Complete vessel	4
Rim	42
Body	44
Base	1
Unidentified sherd	1
Total	**92**

Table 60. Type of Whole Shape of the Vessels in Operation 21.

Whole Shape of the Vessel	**QTY**
Open vessel	30
Pot	5
Unidentified vessel	57
Total	**92**

Table 61. Decoration Techniques of Ceramics in Operation 21.

Decoration Techniques	**QTY**
Absent	2
Painted	80
Modeled	4
Unidentified	6
Total	**92**

The estimated chronological period determined based on the decorative elements of the ceramic sherds in Operation 21, indicates that the tombs were constantly occupied during the Early Intermediate Period (1 – 700 A.D.) and the Middle Horizon Period (700 – 1000 A.D.) (Table 62).

Table 62. Estimated Chronological Period of Ceramics in Operation 21.

Estimated Period	**QTY**
Unknown	10
Early Intermediate Period	10

Table 62. Estimated Chronological Period of Ceramics in Operation 21.

Estimated Period	QTY
Middle Horizon	72
Total	**92**

Figure 22. Ceramic Sherds found in Operation 21.

6.6.1.2. Lithic Tools Analysis

The materials found in the *chullpa* tomb included few lithic artifacts. This section is a general analysis of the type of stone artifacts and the raw material (Table 63). In this tomb, only 3 lithic artifacts were recovered and analyzed.

Table 63. Lithic Artifacts in Operation 21.

Type	QTY	Raw Material		
		White	Gray	Unidentified
Debris	2	0	2	0
Uniface	1	0	1	0
Total	**3**	**0**	**3**	**0**

6.6.1.3. Faunal Bones Analysis

In this section, I list the faunal bones identified in Operation 21. One thousand four hundred and ninety five fragments of faunal bones were found in this tomb. I divide the faunal bones between prehistoric species (456 fragments) (Table 64) and modern species (1039 fragments) (Table 65).

Table 64. Classification of Prehistoric Faunal Species in Operation 21.

Species		Common Name	NISP
Prehistoric Species	*Non identified amphibious*	Amphibious	5
	Nothoprocta sp.	Partridge	4
	Non identified bird	Bird	1
	Lonchophylla sp.	Bat	1
	Cavia porcellus	Guina pig	39
	Agouti sp.	Pacas	38
	Felis sp.	Wildcat	6
	Lama sp.	Llama	5
	Non identified carnivorous		55
	Odocoileus virginianus	White-tailed deer	15
	Sus scrofa	Wild pig	22
	Artiodactyla	Hoofed mammal	228
	Non identified mammal		37
	Total Native Species		**456**

Table 65. Classification of Modern Faunal Species in Operation 21.

Species		Common name	NISP
Modern Species	*Rattus rattus*	Rat	1034
	Bos taurus	Cow	3
	Ovis aries	Sheep	2
	Total Non Native Species		**1039**

6.6.1.4. Botanical Remains Analysis

In this section, I list the identified botanical remains found in this *chullpa*. The macro-botanical remains were classified into their parts as follows on Table 66:

Table 66. Classification of Part of Plants in Operation 21.

Part of the Plant	NISP	Weight
Seed	2	1.365
Leaf	13	5.525
Fruit	1033	259.1
Wood	2650	4029.1
Fiber	41	10.44
Root	88	38.46
Bark	265	106.7
Carbon	103	38.12
Fungus	1	1
Unidentified	5	1.19
Total	**4201**	**4491.00**

The number of plants that were identified in this *chullpa* tomb was 1180 fragments of plants were identified in this *chullpa*, including the following plants on Table 67.

Table 67. Plant identified in Operation 21.

Identified Materials	NISP	Weight
Zea mays	42	16.67
Arachis hypagoea	43	5.925
Lagenaria siceraria	920	2158
Poaceae	4	1.065
Stipa ichu	58	14.26
Tillandsia landbeckii	88	79
Agave americana	10	21.58
Cucurbita maxima	11	18.26
Persea americana	4	1.365
Unidentified Plants	3021	2174.875
Total	**4201**	**4491**

6.6.1.5. Soil Samples Analysis

I separated the remains recovered from the heavy and the light soil sample. Few soil samples were collected during the excavation of this *chullpa.* In the heavy sample

only 1 botanical fragment was identified, while non-botanical remains were identified in the light fraction. See Table 68 for details.

Table 68. Identified Plants in the Heavy and Light Soil Samples in Operation 21.

Identified Materials	Heavy Sample		Light Sample	
	Op. 21		Op. 21	
	NISP	Weight	NISP	Weight
Agave americana	1	0.01	0	0
Unidentified Plants	5	1.367	3	0.405
Total	**6**	**1.377**	**3**	**0.405**

Other materials were found in the heavy and light soil samples from Operation 21. See Table 69 for details.

Table 69. Identified Materials in the Heavy and Light Soil Samples in Operation 21.

Identified Materials	Heavy Sample		Light Sample	
	Op. 21		Op. 21	
	NISP	Weight	NISP	Weight
Ceramics	4	6.385	0	0
Animal Bone	52	9.22	14	0.14
Animal Coprolite	20	0.7	0	0
Larva	1	0.01	0	0
Mica	0	0	6	0.055
Total	**77**	**16.315**	**20**	**0.195**

6.6.1.6. Human Bones Analysis

The MNI of human individuals was determined that the bones were at least 75% complete. For the estimation of sex and age of individuals in Operation 21, one of the elements analyzed was the cranium (See Table 70).

Table 70. MNI calculations based on cranial bones in Operation 21.

Cranium calculations of Sex and Age	MNI
Sub-adult	1
Adult male	0
Adult probable male	1
Adult female	3

Table 70. MNI calculations based on cranial bones in Operation 21.

Cranium calculations of Sex and Age	MNI
Adult probable female	0
Adult unidentified sex	1
TOTAL	**6**

Also, for the estimations of age, the MNI analysis was done with the calculations of long bones, in this case left femur (Table 71).

Table 71. MNI calculations based on long bones in Operation 21.

MNI Long Bone Calculations	Op. 12	
	MNI	Element
Adult	12	Left clavicle
Sub-adult	3	Left clavicle
TOTAL	**15 individuals**	

6.6.2. Summary of Operation 21

This *chullpa* tomb was partially looted. The material remains were removed before the excavations, so the recovered material will provide partial information on burial practices of the Middle Horizon Period in Hualcayán.

The most common vessels identified in this *chullpa* were open vessels and pot; with painted and modeled decoration. Based on the analysis of the ceramic sherds, this *machay* was probably used during the Middle Horizon Period (700 – 1000 A.D.).

The faunal remains identified in this *chullpa* indicate that most of the species were guinea pig, *pacas* (bird), non-identified carnivorous, and hoofed mammals. A little over thirty percent of the species were prehistoric faunal species, while 69.50% were modern faunal species.

The species of plants identified during the analysis of botanical remains and soil samples demonstrate that some of the plants were originally from the local *Quechua* zone (2000 – 3000 masl). This includes maize, peanut, mate, cane, ichu, tillandsia, maguey and pumpkin. Another plant, avocado, was from the lower elevation *Yunga* zone (500 – 2000 masl).

Other materials that were found in the soil sample analysis were mostly fragments of animal bones, and animal coprolites.

The MNI calculations based on cranial bones to identify the sex and age of individuals demonstrate that 1 individual was sub-adult, 1 individual was probable male adult, 3 individuals were female adults, and 1 undetermined sex individual. However, the long bone calculations used to identify the age of the individuals demonstrate that 12 individuals were adults, and 3 individuals were sub-adults

Chapter 7 – Results of the Study of Funerary Contexts in the Archaeological Site of Hualcayán

My goal in this concluding chapter is to produce a model based on the characteristics of analysis of the material culture in the funerary contexts at Hualcayán. The first section is a summary of the data collected from the funerary contexts. It includes the estimation of the temporary occupation of the tombs, and the characteristics of the material culture through time and space. The second section is an interpretation of the funerary practices at Hualcayán, based on the research questions from Chapter 2. Finally, this chapter ends by emphasizing the contributions of the investigations of funerary practices in the archaeological field.

7.1. Summary of Data from Funerary Contexts at Hualcayán Site

The analysis of the material culture from funerary contexts at Hualcayán permitted me to reconstruct patterns of local change during the occupation of the site.

The analysis of diagnostic ceramic sherds from Hualcayán tombs provided sufficient information in order to determine the whole shape of the vessels, and to estimate the chronological occupation of the tombs (See Appendix A). The types of vessel sherds analyzed at Hualcayán tombs were mostly rim and decorated body sherds. The type of vessels used for funerary practices were mostly open vessels, like plates; closed vessels, like pots; a bowl with a flattering lip, known as *escudilla* (common ceramic form of the Recuay culture), pots, large jars, figurines, cups, and spoons. The manufacture methods of the ceramic vessels suggested that most of the vessels were made by modeled techniques, and few of them were made in molds. The firing technique of the ceramics suggested that most of them were fired in an oxidized atmosphere,

however a few of the ceramics were fired in a reduced atmosphere. The ceramic sherds had a variety of decoration techniques, but most of them had painted and incised decorations, while few ceramic sherds were engraved, stamped, molded and had modeled decorations. According to the nature of the colors of the ceramic sherds, I determined that mostly were monochromatic (same color of the paste or slip), and a few were polychromatic.

The estimation of the chronological periods based on the analysis of ceramic sherds suggests that the *machay* and semi-subterranean tombs were constantly used during the Early Intermediate Period (A.D. 1 – 700). During this period, two phases of occupation were defined based on the decoration techniques and shape of the vessel: 1) Huarás phase (A.D. 1 - 200), which had open bowls with white on red painted decoration; and 2) Recuay phase (A.D. 200 - 700), which had open vessels that were made with white/kaolin clay. The *chullpa* and *machay* tombs were also used during the Middle Horizon Period (A.D. 700 - 1000). The most common vessel in this period was open vessels, like plates, as well as pots, jars, figurines, cups, and spoons. Most of these ceramics had polychromatic decoration.

The raw materials of the lithic artifacts in the funerary contexts were mostly local rocks, white quartz, dark grey flint, and slate-like rocks. The first part of the analysis was to separate the artifacts into chipped and ground stones. Most of the lithic artifacts were flake and debris or shatter from the manufacturing process. Next, the chipped stones were classified into other tool types: cores, unifaces, and bifaces (See Appendix B).

Because of the very limited number of lithic artifacts recovered and the lack of a comparative database from similar archaeological contexts, this artifact type added very

little information to the interpretation of the tombs at Hualcayán. Whereas there were twice as many flakes and nearly four times the number of cores in Operation 6 compared to Operation 3, seemingly this finding might support the interpretation that the Operation 6 tomb was the location of a significant amount of tool manufacturing. However, the quantity of lithic artifacts is still quite small even in Operation 6, suggesting only a modest amount of lithic manufacturing activities regardless. Notably, there was never more than one bifacially or unifacially worked tool in any tomb. The small quantity of lithic materials recovered from within the tombs is perhaps the most significant finding about this artifact type from the Hualcayán tombs.

Even though the Number of Identified Individuals Specimens (NISP) could overestimate or underestimate the actual number of individuals in each context, this method provided accurate data that can be combined and compared. The faunal analysis was done with the goal to identify prehistoric and modern faunal remains (See Appendix C). Seventeen species of prehistoric animals were identified. These species were organized into six groups: amphibious (*Bufo sp. and* non-identified amphibious), birds (*Nothoprocta sp., Colaptes sp., Cairina moschata, Zenaida auriculata, Passeriforme* and non-identified birds), chiropterans (*Lonchophylla sp*. and non-identified chiropteran), rodents (*Didelphis sp., Cavia porcellus, Lagidium peruanum,* and *Agouti sp.*), carnivores (*Felis sp.,* and non-identified carnivorous), camelids (*Lama sp., Odocoileus virginianus, Sus scrofa,* and *Artiodactyla*), and non-identified mammals.

The most common prehistoric faunal bones were non-identified mammals (709 fragments), rodents (413 fragments), hoofed mammals (298 fragments), guinea pigs (272 fragments), *vizcacha norteña* (124 fragments), non-identified birds (88 fragments), and

non-identified carnivores (59 fragments). The modern faunal remains were identified as roosters (10 fragments), rats (1121 fragments), cows (3 fragments), goats (3 fragments), and sheep (3 fragments).

The botanical remains found in the tombs at Hualcayán suggest that the most common part of plant found at the tombs were fragments of wood (3239 fragments), fruit (1153 fragments), fiber (424 fragments), bark (284 fragments), carbon (199 fragments), and root (152 fragments). The botanical remains were mostly fragmented, and few of them were burned.

The species of plants identified during the analysis of botanical remains demonstrate that some of the plants were originally from the local *Quechua* zone (2000 – 3000 masl). This includes *Capsicum sp.* (chili), *Zea mays* (maize), *Canna sp.* (achira), *Lagenaria siceraria* (mate), *Poaceae* (cane), *Stipa ichu* (ichu), *Tillandsia landbeckii* (tillandsia), *Agave Americana* (maguey), *Phaseolus vulgaris* (beans), and *Cucurbita maxima* (pumpkin). Other plants, *Persea Americana* (avocado), *Erythroxilon coca* (coca), *Arachis hypogaea* (peanut), and *Psidium guajaba* (guayaba) were from the lower elevation *Yunga* zone (500 – 2000 masl) (See Appendix D).

I did not combine the results from the analysis of macro-botanicals remains with the results from the soil samples, because no soil samples were collected from Operations 8 and 12. The analysis of the heavy and light fractions permitted me to identify several botanical species such as *Capsicum sp.* (chili), *Zea mays* (maize), *Canna sp.* (achira), *Lagenaria siceraria* (mate), *Poaceae* (cane), *Stipa ichu* (ichu), *Tillandsia landbeckii* (tillandsia), *Agave Americana* (maguey), *Cucurbita maxima* (pumpkin), *Persea Americana* (avocado), *Erythroxylon coca* (coca), *Arachis hypogaea* (peanut), and

Psidium guajaba (guayaba). Other materials identified during the analysis of heavy and light fractions of soil samples were fragments of ceramic, animal bone, terrestrial shell, animal coprolite, larva, mica, insect, thread, metal, finger nail, fiber, clay, kaolin clay, human tissue, and hair (See Appendix E).

The analysis of long bones (complete individuals, femurs, tibias and clavicles) determined the amount of adults and sub-adults in each tomb. Based on this analysis, at least 9 individuals were buried in a semi-subterranean tomb, 12 individuals in a *machay* tomb, and 15 individuals in a *chullpa* tomb. There is evidence of sub-adults in all of these three types of tombs (See Appendix F).

The determination of sex of the individuals was done based on the analysis of cranial bones. The number of human individuals varied in each kind of tomb. At least two male adults were buried in a semi-subterranean tomb, six male adults in a *machay* tomb, and one male adult in a *chullpa* tomb. While no female adults were buried in a semi-subterranean tomb, two female adults were buried in a *machay* tomb, and three female adults in a *chullpa* tomb (See Appendix F).

7.2. Answers to Research Questions

In this section, I answer the research questions that I listed in Chapter 2, with the goal to provide information for the interpretation of the site.

Which burial pattern variations occurred in Hualcayán during A.D. 1 to 1000?

In Hualcayán, the semi-subterranean tombs were mostly used during the Early Intermediate Period (A.D. 1 - 700). The *chullpa* tomb was used primarily during the Middle Horizon Period (A.D. 700 - 1000), but there is evidence of ceramic sherds from

the previous period at this tomb. However, the *machay* tombs had a continuous phase of construction from the Early Intermediate Period to the Middle Horizon Period (A.D. 1 - 1000). This information suggests that the selection of specific types of tombs for burials were different through time (See Table 72).

Table 72. Chronological Sequence of Funerary Contexts at Hualcayán

Andean Sequence	**A.D.**	**Type of Tombs at Hualcayán**	
Middle Horizon Period	1000 700	Machay tomb	Chullpa tomb
Early Intermediate Period	 1	Machay tomb	Semi-subterranean tomb

According to Lau (2011), semi-subterranean tombs are in general older than *chullpas,* and this last form of tomb was a predominant burial form from the Middle Horizon Period (A.D. 700 – 1000) until Colonial Times (A.D. 1532 - 1821).

The architectural features for the construction of the tombs suggest that they were built with the *wanka-pachilla* technique, or block and spall stonework technique (Tello 1929, 1930; Lau 2011). This technique was common for the construction of residential architecture, defensive constructions, canals, ceremonial plazas and enclosures, and funerary structures in the highlands of Ancash (Lau 2011). In Hualcayán, the six tombs described in this thesis use this stone architectural technique in stonewalls and roofs, like as evidence in the *chullpa* tomb (Operation 21). This kind of architecture created strong and durable buildings

What are the burial pattern variations within funerary structures at the site of Hualcayán from A.D. 1 to 1000?

In reference to the building area of the funerary tombs at Hualcayán, *machay* tombs tend to enclose the largest burial space. For example, Operation 3 encloses an area of $19m^2$, and Operation 11 encloses an area of $11m^2$. However, the semi-subterranean tomb encloses an area of $6m^2$ (Operation 6). The *chullpa* tomb encloses an area of $16m^2$ (Operation 21), and the *chullpa-machay* encloses an area of $12m^2$ (Operation 12).

The number of chambers varies in each tomb at Hualcayán. *Machay* tombs had one (Operation 8 and 11) to five chambers (Operation 3). The semi-subterranean tomb had two chambers (Operation 6), as well as the *chullpa-machay* (Operation 12), while the *chullpa* tomb had three chambers (Operation 21).

The building practices of funerary structures at Hualcayán suggest that multiple individuals were buried in the fetal position. However, *machay tombs* contained the most number of individuals (49 individuals in Operation 3), while semi-subterranean tomb contained 9 individuals (Operation 6), and the *chullpa* tomb contained 15 individuals (Operation 21).

Machay and *chullpa* tombs have an equal variety of botanical species. Thirteen different species of plants were identified in the six tombs at Hualcayán. The presence of maize (*Zea mays*), in five of the six tombs at Hualcayán, is evidence that this plant probably played two roles in ancient societies. Maize was one of the most important foods and raw material in prehistoric Peruvian societies, and it was cultivated for the elaboration of *chicha* (corn beer) for ceremonies (Bonavia 2008). At Hualcayán, the presence of maize in the funerary contexts demonstrated how relevant it was as a food

source, raw material, medicinal plant, and for fuel. The presence of coca seeds (*Erythroxylon coca*) in one of the largest tomb is evidence that this plant was brought from a lower elevation area. The coca leaves were used for masticatory practices, and played an important role in political relationships, because in ancient times, only privileged individuals had access to this plant.

Seventeen different species of animals were identified in the six tombs at Hualcayán. *Machay* (Operation 3) and *chullpa* (Operation 21) tombs have an equal variety of faunal species; both have thirteen different species. However, the semi-subterranean tomb (Operation 6) had twelve species.

What are the similarities and differences in burial pattern variations within funerary structures by chambers at the site of Hualcayán?

Given the available data, nothing can be said about the burial pattern variations by chambers within individual funerary structures at the site of Hualcayán, because there is not enough information to do these comparisons.

How does the data about mortuary practices in Hualcayán support the overall interpretation of the site?

The *chullpas* and semi- subterranean tombs provided the greatest choice for the location and orientation of the tombs entrance. However, *machays* tombs were adapted to a natural cave, rock shelter, or under large boulders (Herrera and Lane 2005). This kind of tomb was also built in Hualcayán due to the local geography, where caves are located in the mountain slopes.

In the three main funerary structures at Hualcayán, corpses were placed along with their belongings, including clothing, plants, ceramics, lithic tools, and animals. These artifacts found in the tombs were given as offerings for the deceased based on contemporary analogy and other historic records. Guamán Poma de Ayala, in his greatest work *El primer nueva corónica y buen gobierno* (The First New Chronicle and Good Government), wrote the longest sustained critique of Spanish colonial rule produced by an indigenous person (Guamán Poma de Ayala 1936). In his publication that includes drawings, he expresses his point of view of the conquest; including how important the funerary practices were in ancient Perú (Figure 23).

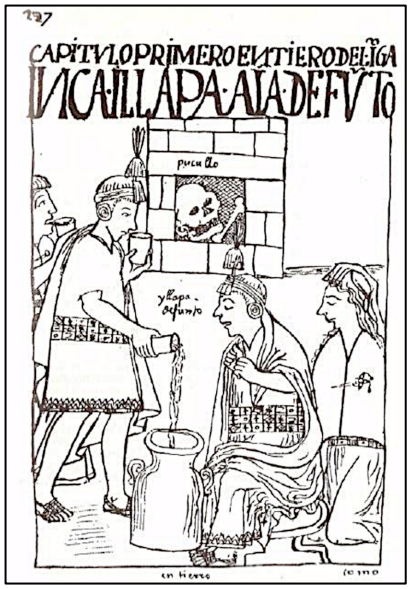

Figure 23. Ancestor veneration practices based on Guamán Poma drawings. Original drawing in his publication from 1615.

The spatial organization of the area surrounding the tombs, especially the *chullpas* and semi-subterranean tombs, supports the conclusion that ritual activity had taken place near the tombs. Ritual practices could have taken place on a larger scale in the open space adjacent to the *chullpa*, *machay* and semi-subterranean tombs. The group of individuals that were buried at Hualcayán probably lived very close to the funerary structures. Also,

the individuals probably shared a set of funerary beliefs, and for that reason, they continued performing burial practices in the same area.

Ancestor veneration is a common practice in the Central Andes nowadays, and it constituted an important dimension of feasting practices in particular areas. Feasting is considered to be the public consumption of an elaborate meal often accompanied by entertainment in ancient and contemporary societies (Dietler and Hayden 2001). According to Lau (2002, 2011) and Gero (1990), feasting practices indicated political authority and communal gathering for ceremonies, as well as strategies to ensure fertility, wealth and power associated with labor recruitment. These funerary structures could be linked to ancestor veneration practices (Lau 2002).

7.3. Contributions of the Investigations of Funerary Contexts

The study of funerary contexts at the Andean archaeological sites is largely the result of a long tradition in archaeological research. Although most of the tombs at Hualcayán were looted, the presence of abundant, disarticulated, and displaced human remains can provide information on past inhabitants and mortuary practices (Gerdau-Radonic and Herrera 2010).

Part of this study was to demonstrate that it is possible to collect data from looted contexts, define techniques for the analysis of the material culture in the tombs, and interpret the past mortuary practices. I recorded the associations of disturbed and undisturbed materials in the funerary contexts, which provided me with information on the diversity of funerary offerings, chronological placement, number of individuals buried in each structure, and the construction of mortuary structures.

Future studies can provide more information about these ancient practices, such as determining if individuals at Hualcayán belong to the same family group by doing DNA analysis, by using data from current projects as a baseline to test additional contexts at Hualcayán, and finally by comparing these results with data from other sites in the region.

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2016 Figure 1. Location of Hualcayán Site http://hu01.maps.arcgis.com/home/webmap/viewer.html?webmap=483bc9b006c84d92a8ed5b6a334254bb (accessed February 21, 2016)

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Google Earth

The following figures were original from Google Earth, the modifications were added by the author.

2016 Figure 2. Location of Hualcayán and its sectors (accessed March 7, 2016).

2016 Figure 3. Location of Hualcayán Site (accessed March 7, 2016).

2016 Figure 4. Location of Hualcayán (accessed March 7, 2016).

2016 Figure 5. Map with the location of the Tombs, 3, 6, 8, 11, 12, and 21 (accessed February 6, 2016).

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Appendix A.

Ceramic Analysis Data at Hualcayán Site

By Elizabeth Cruzado, February 14, 2016

Types of Vessel Sherd for Ceramic Sherds

Vessel Sherd	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Complete vessel	3	1	-	1	0	4
Rim	6	2	0	3	1	42
Body	10	10	1	4	0	44
Base	0	1	0	0	0	1
Handle	0	0	0	0	0	0
Neck	2	1	0	0	0	0
Undetermined sherd	0	0	0	0	0	1
Total	**21**	**15**	**1**	**8**	**1**	**92**

Type of Whole Shape of the Vessels

Whole Shape of the Vessel	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Open vessel	0	1	0	0	0	30
Closed vessel	1	0	0	2	0	0
Bowl with flattering lip	1	0	0	0	0	0
Pot	2	0	0	0	0	5
Large jar	2	0	0	0	0	0
Figurine	2	0	0	0	0	0
Cup	2	0	0	0	0	0
Spoon	2	0	0	0	0	0
Undetermined vessel	9	14	1	6	1	57
Total	**21**	**15**	**1**	**8**	**1**	**92**

Types of Manufacture Methods for Ceramic Sherds

Manufacture Method	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Modeled	17	15	1	8	1	88
Coiled	0	0	0	0	0	0

Types of Manufacture Methods for Ceramic Sherds (continued)

Manufacture Method	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Molded	4	0	0	0	0	4
Undetermined	0	0	0	0	0	0
Total	**21**	**15**	**1**	**8**	**1**	**92**

Types of Firing Techniques for Ceramic Sherds

Firing Technique	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Oxidized	15	14	1	8	0	89
Reduced	6	1	0	0	1	3
Total	**21**	**15**	**1**	**8**	**1**	**92**

Decoration Techniques of Ceramics Sherds

Decoration Techniques	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Absent	5	9	0	3	0	2
Incised	4	3	0	0	0	0
Engraved	0	0	0	0	1	0
Stamped	1	0	1	5	0	0
Painted	5	3	0	0	0	80
Molded	4	0	0	0	0	0
Modeled	1	0	0	0	0	4
Undetermined	1	0	0	0	0	6
Total	**21**	**15**	**1**	**8**	**1**	**92**

Types of Nature of Colors for Ceramic Sherds

Nature of Colors	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Monochrome	12	3	0	2	1	83
Bichrome	2	7	1	6	0	0
Tricolor	0	0	0	0	0	8
Polychrome	3	0	0	0	0	1
Undetermined	4	5	0	0	0	0
Total	**21**	**15**	**1**	**8**	**1**	**92**

Estimated Chronological Period of Ceramics Sherds

Estimated Period	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	QTY	QTY	QTY	QTY	QTY	QTY
Unknown	13	4	0	2	1	10
Early Horizon Period	0	3	0	0	0	0
Huarás Phase	1	0	0	4	0	0
Early Intermediate Period	0	8	1	2	0	10
Middle Horizon	6	0	0	0	0	72
Late Intermediate Period	1	0	0	0	0	0
Total	**21**	**15**	**1**	**8**	**1**	**92**

Appendix B.

Lithic Data Recording and Analysis at the Hualcayán Site

By Robert P. Connolly, March 1, 2016.

The methods reported below are those I used in the analysis of the lithic materials excavated from Hualcayán between 2011 – 2014. The paucity of lithic materials recovered from tomb contexts preclude meaningful interpretation except in noting there relative absence compared to other artifact types and lithic materials recovered from non-tomb contexts. Regardless, the methods employed in the data recording and analysis were based on the following research methods.

Noteworthy is the general lack of consideration of lithic assemblages recovered from prehistoric sites in Huaylas, Peru. The sole reference for a regional lithic assemblage (Lau 2001:377-394) proved of little value in developing a methodology for the analysis of the Hualcayán tomb assemblage.

Research Objectives

The development of the chipped stone analysis methods and measures focused on addressing the following questions and expectations.

1. Which lithic assemblage characteristics best provide evidence for specific technological and functional inferences?
2. What classifications and characteristics of the Hualcayán lithic assemblage provide the most unambiguous interpretation of specific activity areas, for intra-site comparisons, and for inter-site comparisons?

3. The expectations for specific activities as reflected in flint artifacts are discussed below. Note that the types listed below are not necessarily mutually exclusive, may co-occur in combination, or may be encountered as isolated outlier zones.

Habitation zones are expected to contain the widest array of all lithic artifact attributes based on the presumed non-specialized and multi-task nature. Habitation zones are also expected to contain low to moderate densities of lithic materials, regularly maintained cooking and structure zones that are virtually "clean" of artifacts.

Lithic reduction stations are expected to contain a more restricted range of artifact and raw material types reflecting one or more specific manufacturing trajectories. Density of artifacts is expected to be high. Use-wear rates should be predictably low.

Non-lithic material processing zones are expected to contain a proportionately greater number of formal tools and a high rate of use-wear. Lithic artifact densities should be moderate to low, reflecting a space maintained for the processing of other materials.

Lithic dumping zones are characterized by containing the highest density of artifacts in a sharply circumscribed area. Such zones are expected in association

with any of the above zone types. Variability in the assemblage is dependent on the associated activity type.

Special purpose zones, admittedly a catch-all category not easily placed within another zone type, are expected to contain highly anomalous lithic deposits. Conventional reporting refers to such contexts as "ritual" whereas this report uses the less loaded term "specialized."

The task of addressing these questions and expectations forms the basis of the following methods for the analysis of the Hualcayán lithic assemblage.

Debitage Classification

A voluminous discussion in lithic analysis has focused on the reliability of inferring type or stage of reduction based on debitage form (e.g., Amick and Mauldin 1989; Henry and Odell 1989; Odell 1996; Prentiss 1998; Sullivan and Rozen 1985). Models that rely on the presence or absence of cortex (White 1963) are problematic. No consistent percentage of cortex on the exterior surface of lithic debitage has been established for the assignment of materials to either primary, secondary, or tertiary stages of reduction. Sullivan and Rozen (1985:757) report the wide range of cortical variation that different analysts have used in assigning debitage to the same stage of reduction. In addition, analysts use various reduction sequence typologies that are not comparable. A cursory examination of the literature reveals a bewildering array of flake types, often undefined by the author. The current situation makes intersite comparison of lithic

assemblages difficult, to say the least, and incomplete or imprecise at best.

White's flake typology (1963), which served as the basis for a large portion of lithic analysis since the early 1960s, does not account for the completeness of a flake. Therefore, in White's typology, a flake fragment with an exterior surface completely covered by cortex will be assigned to the primary decortication category on the assumption that the unobserved portion of the flake also retains cortex over the entire exterior surface. This assumption may not be warranted in all cases. Depending upon the typology used and the corresponding cortex presence requirements for establishing a specific stage of reduction (see Sullivan and Rozen 1985:757), the unobserved portion of the flake may or may not affect assignment to a primary, secondary, or tertiary stage. Again, the ambiguity may result in tenuous intersite comparisons. This is especially problematic with samples, such as the Hualcayán lithics, that contain a large percentage of incomplete flakes and debris.

In addition, raw materials obtained from tabular bedded sources or as nodules will differentially reflect the presence or absence of a distinguishable cortex. When cortex is present, variation in nodule size affects the amount of cortex present. Smaller nodules contain more cortex per volume than larger nodules. Therefore, the ratio of cortical to non-cortical flakes is greater for small as opposed to larger nodules.

This discussion does not invalidate or ignore the interpretative value of cortical variation in lithic debitage assemblages. The intention is to establish comparable units of analysis that aid in inter-site and inter-observer comparisons. Establishing the completeness of a debitage artifact as a first step in the analysis of lithic assemblages alleviates some problems discussed thus far. When the unit of analysis is consistent,

whether an analyst chooses to assign 50-70% or only 100% cortical flakes to the primary reduction stage, the designation is less problematic. The basis for such an assignment is technological interpretation. The initial designation of completeness however is an interpretation-neutral categorization.

The analysis of metric attributes (length, width, thickness, and weight) among comparable units of analysis of lithic debitage provides supporting evidence for inferences regarding type of reduction (primary vs. secondary). Neither size nor any other single characteristic of lithic debitage can be the sole determinant for inferences about the type of reduction activity. In general, however, primary reduction should be represented by larger and heavier debitage than secondary reduction (McGimsey, Odell, and Wiant 1986:197). Different reduction stages should be observable in the clustering of metric attributes within and between assemblages.

In consideration of the previous discussion and the stated goals of the current research, the following debitage typology developed by Sullivan and Rozen (1985:758-759), based on the completeness of individual artifacts, is used for the analysis of chipped stone artifacts from Hualcayán:

Complete Flakes are debitage that have a single interior surface as indicated by positive percussion features such as ripple marks, force lines, or a bulb of percussion. Complete flake margins also must be intact with either a distal hinge or feather termination. A point of applied force must be present. Sullivan and Rozen (1985:758) state that a missing striking platform indicates the absence of a point of applied force. This requirement would eliminate those flakes whose platforms shattered during

detachment from the core material. The current analysis does not consider platform attributes. The metric variables derived from the complete flake category are length, width, thickness, and weight. The presence or absence of a striking platform is not crucial to these variables. For this study, a striking platform is not required to judge a flake complete, so long as a bulb of percussion is present and the absence of a striking platform does not affect the measurement of flake length by more than 2 mm. The estimate pertains only to flakes with crushed or collapsed platforms. A generalized reconstruction of flake form determined the 2 mm estimate and is considered approximate.

Proximal Flakes meet the same criteria as complete flakes except their margins are not intact. Therefore, this category includes flakes that terminate distally in a step fracture or lack their distal portions because of breakage from use or other cultural or natural processes.

Flake Fragments exhibit single interior surfaces as defined above but do not possess intact margins or evidence of a point of applied force.

Debris accommodates those lithic artifacts that do not exhibit single interior surfaces, intact margins, or points of applied force. This category includes what analysts refer to as “shatter,” “fragments," “angular fragments" (Stafford 1985:259), "nonorientable fragments" (Prentiss and Romanski 1989:89), or "chunks" (Tomka 1989:137). This category can perhaps best be described as containing indeterminate

lithic materials resulting from the manufacture of chipped stone artifacts.

Complete flake length, width, thickness, and weight measurements were recorded for each artifact. Weight was measured to the nearest 0.1 gram using a digital balance. Length, width, and thickness were recorded using a 6 inch digital caliper. The measurements used for this study are based on Wiant and Odell (1986:177) and are as follows:

1) Length - Length of flake on a line perpendicular to the striking platform, measured to the nearest millimeter.
2) Width - Maximum width measured perpendicularly to the longitudinal axis, measured to the nearest millimeter.
3) Thickness - At a point approximately one-half of the flake length distal to the bulb of percussion, measured to the nearest millimeter.
4) Weight - Measured to the nearest 0.1 gram.

Artifacts that could not be oriented reliably to the point of applied force (e.g., core material, debris, flake fragments) were oriented such that lengths were the greatest measure, width the second largest measure, and thickness the smallest measure.

Relative thickness

Relative thickness (Sullivan and Rozen 1985:765) is a measure of a complete flake defined as the sum of the flake's length and width divided by the flake's thickness. This variable describes flake morphology for generating broad interpretations of reduction stage. However, relative thickness cannot stand alone

as a reliable and valid measure. For example flakes with the following values and different shapes yield the same relative thickness:

length	=	20	length	=	40
width	=	16	width	=	20
thick	=	3	thick	=	5
relative thickness	=	12	relative thickness	=	12

However, factoring in weight allows for the recognition of the different morphology of the two flakes, providing a more robust description of artifact form. The utility of the median value of a sample's relative thickness in combination with the sample's median weight of complete flakes is useful in providing a general measure of the reduction stage represented. This assertion is based on a large to small, primary to tertiary reduction continuum.

To summarize, a debitage typology based on completeness best suits the Hualcayán lithic assemblage for several reasons. First, categories are mutually exclusive, interpretation-neutral, and the analysis accommodates the full range of variation in a lithic debitage assemblage (Rozen and Sullivan 1989b: 179-181; Sullivan and Rozen 1985:759). Second, after sorting debitage into mutually exclusive categories, inferences can be made based on variation in raw material, cortex, use-wear, and other attributes using comparable rather than unknown or dissimilar units of analysis. Third, mutually exclusive categories that accommodate the full range of variation in a lithic debitage assemblage can be most profitably employed in intrasite and intersite comparisons.

Fourth, the typology captures variation at the assemblage rather than the artifact level.

Other Artifact Types

Bifacially Worked Tools. As is true in virtually all archaeological excavations, bifacially worked tools account for a minute proportion of the total Hualcayán lithic assemblage. The biface category includes all those artifacts that are of a known formal biface type, invasively flaked (flaking not restricted to the periphery), or exhibit evidence of the intentional shaping of at least one edge. Where appropriate, individual bifacial artifacts will be discussed for making technological, functional, or cultural inferences. Metric attributes were recorded for all bifaces.

Core Material. A core, in the most simplistic terms, refers to a lithic artifact that retains evidence of flake detachment (White 1963:6). Cores, therefore, exhibit only negative percussion features (Rozen and Sullivan 1989a). As with other lithic types, analysts evaluate cores by a number of different characteristics. Analysts use the terms "exhausted" and "remnant" cores or core "nuclei" (e.g., McNerney 1987:71; White 1963:6) to denote artifacts that can no longer be flaked because of their reduced state. The type "core fragment" may represent the further reduction of presumably exhausted cores. The most readily available distinctions of cores are those artifacts that exhibit prepared platforms and a spherical or conical shape and multidirectional flake cores that do not necessarily have prepared platforms and whose flakes are more fortuitously and randomly removed (McNerney 1987:75).

Other Variables Included in Analysis

Use-Wear and Retouch. Tentatively and for experimental purposes, baseline use-wear analysis of the Hualcayán lithic assemblage will employ the "Low-Power Approach" described by Odell and Odell-Vereecken (1980). Their method is the least speculative approach, the easiest to perform, and provides the required information for the problems addressed in this chapter. The primary concern is establishing the incidence of use-wear in specific contexts. Artifacts are examined using a 10 to 40 power magnification.

Use-wear is often reflected in microflaking along an artifact's edge. Microflaking that results from the intentional retouch of an artifact may appear similar to edge damage caused by using an artifact for processing materials. Microflaking that results from use-wear is generally smaller, less regularly spaced, and often concentrated on the projecting aspects of the artifact (Odell and Odell-Vereecken 1980:96). Microflaking from spontaneous "retouch" or edge-damage can be confused with use-wear or intentional retouch. This form of edge-damage is not related to prehistoric activity but results from natural processes, excavation techniques, or the transportation and analysis of excavated materials. Such damage will most commonly result in random flake scar patterns, particularly on projecting edges. In order to account for spontaneous retouch, use-wear analysis prudently requires a minimum of three contiguous flake scars on an artifact's edge before an object is judged to exhibit traces of use-wear. Amount of use-wear will be recorded on a scale of 1 to 4 and refers to an average of the percent of occurrence on all edge damaged surfaces(i.e., 1 = < 25%, 2 = 26-50%, 3 = 51-75%, and 4 = 76-100%).

Within a specific recovery context, the occurrence of edge-damage at the

assemblage level can be determined by the relative proportion of artifacts that exhibit traces of use-wear. In addition to artifact type, different raw materials may exhibit different traces of edge damage from similar uses. Therefore, control for raw material will enhance inferences made from this analysis. Finally, working materials such as meat, flesh or other soft materials may not result in edge damage without a protracted period of use, if at all, therefore conservatively biasing any interpretations.

The methods outlined above are considered the most appropriate in general nonspecialized use wear studies at Hualcayán for two reasons. First, the "Low-Power Approach" addresses the immediate questions of amount and intensity of use for the lithic artifacts examined. Given the time constraints and facilities available, this approach was also the most suitable choice because the procedure is the easiest to perform and has a greater validity and reliability than “High-Power” approaches. Second, determining the amount and intensity of use of Hualcayán's artifacts provides data for both intrasite and intersite comparisons.

Cortex Amount. The presence of cortex is often used as a measure of reduction stage. A large number of artifacts whose exteriors are covered with cortex can be indicative of early reduction sequences and a low number can indicate that lithic materials were initially reduced off-site and that only later stage reduction occurred as evidenced by a particular assemblage. Although reliance on cortex as a sole indicator of reduction is problematic, as discussed above, presence/absence is useful as a single indicator. Although many analysts insist that the exterior surface of a flake be covered entirely by cortex to constitute what is referred to as a “primary decortication flake,” the

apparent lowest amount of coverage considered valid for this type of flake is 70% (Sullivan and Rozen 1985).

The amount of cortex present on lithic debitage can be used to infer primary reduction. As argued above, complete flakes provide the most meaningful indication of cortex presence. This does not preclude, however, comparing the presence of cortex among other comparable units of analysis, or within a given context. To provide the most complete data on which to base interpretations, the cortex present on the exterior surfaces of all lithic artifacts was recorded on a scale of 1 - 10 (1 = 10% coverage, 10 = 100% coverage).

Raw Material – As there was no comparative sample available for recording raw material, only color and obvious types were noted. Further, as the Hualcayán lithic assemblage remains unwashed, color and material type often could not be reliably determined.

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Appendix C.

Faunal Bones Analysis Data at Hualcayán Site

By Teresa Rosales, November 27, 2015

Classification of Prehistoric Faunal Species

Species		Common name	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
			NISP	NISP	NISP	NISP	NISP	NISP
Native Species	*Bufo sp.*	Amphibious	0	2	0	0	0	0
	Non identified amphibious	Amphibious	1	1	0	0	6	5
	Nothoprocta sp.	Partridge	1	0	0	1	0	4
	Colaptes sp.	Woodpecker	1	0	0	0	0	0
	Cairina moschata	Creole duck	1	0	0	1	0	0
	Zenaida auriculata	Montera dove	1	0	0	0	0	0
	Passeriforme	Bird	1	3	11	0	21	0
	Non identified bird	Bird	0	63	0	24	0	1
	Didelphis sp.	Opossum	10	0	0	0	0	0
	Lonchophylla sp.	Bat	0	0	0	1	0	1
	Non identified chiropteron	Bat	36	16	0	0	0	0
	Muridae	Rodent	240	13	56	74	30	0
	Cavia porcellus	Guina pig	0	0	71	69	93	39
	Lagidium peruanum	Vizcacha norteña	0	0	21	47	56	0
	Agouti sp.	Pacas	0	1	0	0	0	38
	Felis sp.	Wildcat	1	33	0	0	0	6
	Lama sp.	Llama	0	0	2	2	4	5
	Non identified carnivorous		0	4	0	0	0	55
	Odocoileus virginianus	White-tailed deer	0	0	0	0	6	15
	Sus scrofa	Wild pig	3	25	0	0	0	22
	Artiodactyla	Hoofed mammal	63	7	0	0	0	228
	Non identified mammal		433	176	5	54	4	37
	Total Native Species		**792**	**344**	**166**	**273**	**220**	**456**

Classification of Modern Faunal Species

Species		Common name	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
			NISP	NISP	NISP	NISP	NISP	NISP
Native Species	*Gallus gallus*	Bankiva rooster	0	2	0	8	0	0
	Rattus rattus	Rat	72	5	0	0	10	1034
	Bos taurus	Cow	0	0	0	0	0	3
	Capra hircus	Goat	2	0	0	1	0	0
	Ovis aries	Sheep	0	0	0	1	0	2
	Total Non Native Species		**74**	**7**	**0**	**10**	**10**	**1039**

Appendix D.

Botanical Remains Analysis Data at Hualcayán Site

By Elizabeth Cruzado, January 23, 2016

Identification of Part of Plants

Part of the Plant	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	NISP	NISP	NISP	NISP	NISP	NISP
Seed	7	10	1	0	0	2
Leaf	26	0	5	5	16	13
Flower	3	5	0	2	29	0
Fruit	27	1	30	23	39	1033
Legume	0	0	0	0	0	0
Wood	203	15	100	16	255	2650
Fiber	16	0	231	18	118	41
Root	1	0	13	1	49	88
Tuber	1	1	0	0	0	0
Complete Plant	0	0	0	0	4	0
Bark	19	0	0	0	0	265
Carbon	0	95	0	0	1	103
Cactus	0	0	0	0	1	0
Fungus	16	0	0	0	0	1
Undetermined	0	0	0	0	1	5
Total	**319**	**127**	**380**	**65**	**513**	**4201**

Completeness of Plants

Completeness	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	NISP	NISP	NISP	NISP	NISP	NISP
Complete	13	55	0	0	14	0
Fragment	316	72	380	65	499	92
Total	**319**	**127**	**380**	**65**	**513**	**92**

Condition of Plants

Condition	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	NISP	NISP	NISP	NISP	NISP	NISP
Burned	11	120	0	12	72	0

Condition of Plants

Condition	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	NISP	NISP	NISP	NISP	NISP	NISP
Not burned	308	7	380	53	441	92
Total	**319**	**127**	**380**	**65**	**513**	**92**

Identified Plants

Identified Plants	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	NISP	NISP	NISP	NISP	NISP	NISP
Capsicum sp	28	10	0	16	0	0
Zea mays	21	0	2	3	20	42
Canna sp	4	1	0	1	13	0
Erythroxylon coca	2	0	0	0	0	0
Arachis hypagoea	7	2	1	5	0	43
Lagenaria siceraria	16	0	4	24	19	920
Poaceae	61	1	114	5	186	4
Stipa ichu	0	0	12	8	37	58
Tillandsia landbeckii	0	0	0	2	4	88
Agave americana	0	0	0	0	3	11
Cucurbita maxima	1	0	0	0	1	11
Persea americana	0	0	21	0	0	4
Psidium guajava	1	0	0	1	0	0
Phaseolus vulgaris	5	0	0	0	0	0
Undetermined Plants	1402	494	226	304	220	3029
Total	**1548**	**508**	**380**	**369**	**374**	**4210**

Appendix E.

Soil Sample Analysis Data at Hualcayán Site

By Elizabeth Cruzado, February 18, 2016

Classification of Botanical and Other Materials found in Heavy and Light Fractions.

Identified Materials	Op. 3		Op. 6		Op. 11		Op. 21	
	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light
	NISP	NISP	NISP	NISP	NISP	NISP	NISP	NISP
Capsicum sp	6	22	3	7	9	7	0	0
Zea mays	1	1	0	0	0	0	0	0
Canna sp	1	0	0	0	0	0	0	0
Erythroxylon coca	2	0	0	0	0	0	0	0
Arachis hypagoea	1	2	1	1	4	1	0	0
Lagenaria siceraria	0	7	0	0	2	0	0	0
Poaceae	0	2	1	0	2	2	0	0
Stipa ichu	0	0	0	0	8	0	0	0
Tillandsia landbeckii	0	0	0	0	1	0	0	0
Agave americana	0	0	0	0	0	0	1	0
Cucurbita maxima	0	0	0	0	0	0	0	0
Persea americana	0	0	0	0	0	0	0	0
Psidium guajava	0	1	0	0	0	1	0	0
Undetermined Plants	302	268	50	318	109	158	5	3
Ceramic sherd	62	16	154	39	2	0	4	0
Animal Bone	55	133	160	184	45	58	52	14
Terrestrial Shell	7	80	47	101	16	1	0	0
Animal Coprolite	122	128	55	53	119	184	20	0
Larva	10	3	0	0	2	2	1	0
Mica	0	12	0	0	0	0	0	6
Insect	39	74	1	0	4	4	0	0
Thread	11	19	0	0	1	0	0	0
Metal	1	0	0	0	0	0	0	0
Finger nail	1	0	0	0	1	0	0	0
Fiber	0	1	0	0	0	0	0	0
Clay	0	0	3	0	0	0	0	0
Kaolin	0	0	0	5	0	0	0	0
Skin	0	0	0	0	2	0	0	0
Hair	0	0	0	0	0	0	0	0
Undetermined materials	2	2	0	0	1	0	0	0
Total	**623**	**771**	**475**	**708**	**328**	**418**	**83**	**23**

Appendix F.

Human Bones Analysis Data at Hualcayán Site

By Emily Sharp, November 11, 2015

Analysis notes:

- Operation 8 was analyzed by Rachel Witt (2012) and Operation 3 was analyzed by Christine Pink (2013). Other operations were analyzed by Emily Sharp, but this work incudes contributions by bioarchaeologists and some students who collaborated during the PIARA field school. These bioarchaeology collaborators include Liz DiGangi, Sara Becker, Julie Lesnik, Shaina Molano, Ann Laffey, Amy Anderson, and Nicole Thiemann.
- All osteological analyses followed standard protocols (Buikstra and Ubelaker 1994).
- Adult age-at-death range > 15 years of age and sub-adult < 15 years of age.
- To be included in the MNI calculations, each bone must have been at least 75% complete and have been sided (Left/Right).
- The dearth of complete sub-adult crania for Operation 3 does not indicate a lack of burial in this context. We observed cranial fragments from sub-adults for this operation, but they were not included in MNI calculations because they did not comprise a 75% complete cranium.
- The mortuary sample at Hualcayán is biased and cannot be considered representative of a once-living population. The demographic profiles do not demonstrate the expected mortality pattern for most preindustrial populations with high infant

mortality. We would expect a more equal sex distribution and a higher proportion of sub-adults in the sample.

- Some data are incomplete for Operation 8, and further analyses may revise the MNI results. In particular, completeness of the pelves and crania were not fully recorded. Complete crania were combined with fragmented cranial elements in Operation 8 for an MNI of 19.
- Sex estimates based on cranial morphology are less accurate than assessments based on pelvic morphology. Discrepancies in results are difficult to reconcile for commingled skeletal collections. In Operations 3 and 8, more female pelves than male were reported while more male than female crania were reported. These differences could be due to recovery, preservation, or excavation bias, or perhaps due to bias in the original reference samples. For these reasons, sex assessments for Operations 3 and 8 may need further review.

MNI calculations based on long bones calculations

MNI Long Bone Calculations	**Op. 3**	**Op. 6**	**Op. 8**	**Op. 11**	**Op. 12**	**Op. 21**
	MNI	**MNI**	**MNI**	**MNI**	**MNI**	**MNI**
Adult	33	5	8	10	19	12
Sub-adult	16	4	4	4	6	3
TOTAL	**49**	**9**	**12**	**14**	**25**	**15**

MNI calculations based on cranial bones calculations

MNI Crania Calculations	**Op. 3**	**Op. 6**	**Op. 8**	**Op. 11**	**Op. 12**	**Op. 21**
	MNI	**MNI**	**MNI**	**MNI**	**MNI**	**MNI**
Sub-adult	0	5	4	1	3	1
Adult Male	10	2	5	7	10	0
Adult probable male	5	1	1	1	0	1
Adult female	6	0	3	2	11	3
Adult probable female	4	0	1	0	1	0

MNI calculations based on cranial bones calculations

MNI Crania Calculations	Op. 3	Op. 6	Op. 8	Op. 11	Op. 12	Op. 21
	MNI	MNI	MNI	MNI	MNI	MNI
Adult undetermined sex	1	1	0	0	0	1
TOTAL	**26**	**9**	**14**	**11**	**25**	**6**