THE INCA DOGS AND THEIR ANCESTORS

By

MICHAEL WYLDE

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2017
To my loyal friend and companion Roamer, and to my parents, Dennis and Bernice Grout, for their unflagging support.
I would like to thank Dr. Susan deFrance for teaching me zooarchaeology, for introducing me to the beauty of Peru, and for chairing the committee for this dissertation; I would also like to thank her husband, Dr. Michael Moseley, for serving on my committee and for his seminal work *The Incas and their Ancestors*; the title of the present work is an homage to his lifetime of research in Peru that has influenced a generation of Andean scholars. I also thank the other committee members, Dr. Peter Collings and Dr. Jason Byrd, for supporting my research. My thanks to Dr. Kitty Emery and Irvy Quitmyer for allowing me access to the collections housed in Environmental Archaeology at FLMNH, and Dr. Greger Larsen of Oxford for accepting samples into his research. Identification and analysis of the Rio Muerto dog was supported with funds from National Science Foundation Grant # BCS-1152520 awarded to Susan D. deFrance, University of Florida. I thank the Pinto family of Moquegua for accepting me into their family, the staff of the Museo Contisuyo in Moquegua for their gracious hospitality, and to Paul Goldstein for introducing me to “Pepe”. My friends in archaeology; Ann Cordell, Carmen Laguer-Diaz, Ellen Lofaro, Andrea Palmiotto, and Donna Ruhl, for their ability to listen, thanks. I would like to recognize all of my ancestors that did not have the opportunity to gain higher education; this one’s for you. I would also thank my partner, the long-suffering Terry Tilley, a saint. Lastly, I would like to again thank my family for constant moral and financial support, and my dog Roamer for eighteen years of true loyalty, and his insight into the secret world of the dog.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGMENTS</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES</td>
<td>7</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>8</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>9</td>
</tr>
</tbody>
</table>

## CHAPTER

1. **INTRODUCTION** ................................................................. 11

2. **WHY ARE DOGS SO IMPORTANT? DOG DOMESTICATION AND THEIR BIOLOGICAL ROLES** .............................................................. 15

3. **WHY ARE DOGS SO IMPORTANT? DOGS IN SOCIAL CONTEXTS** ........ 20

4. **ANDEAN DOGS BEFORE THE SPANISH: A TEMPORAL OVERVIEW** ......... 35

   - Autochthonous Canids of South America .................................... 35
   - Temporal and Geographic Contexts for Archaeological Dogs in the Andes .......... 37
     - Lithic Period 14,000-5,000 BP ............................................. 38
     - Colonization ........................................................................ 38
     - Arts and technology ............................................................ 39
     - Earliest domestic dogs in Peru .............................................. 40
   - Preceramic 3000-1600 BCE ...................................................... 40
     - Arts and technology ............................................................ 41
     - Preceramic dogs .................................................................... 42
   - Initial Period- c. 1800 BCE-400 BCE ....................................... 42
     - Cultures ............................................................................... 42
     - Arts and technology ............................................................ 43
     - Initial Period dogs ............................................................... 44
   - Early Horizon c. 400-200 BCE ................................................ 45
     - Cultures ............................................................................... 45
     - Arts and technology ............................................................ 45
     - Early Horizon dogs .............................................................. 46
   - Early Intermediate- 200 BCE to 600CE ..................................... 47
     - Moche culture ................................................................. 47
     - Nazca ............................................................................... 50
     - Pachacamac ................................................................. 51
     - Early Intermediate dogs ..................................................... 53
   - Middle Horizon 600-1000CE ..................................................... 54
     - Cultures ............................................................................... 54
     - Arts and technology ............................................................ 56
Middle Horizon dogs ................................................................. 56
Late Intermediate - c. 1100-1500 CE ............................................. 56
Cultures ......................................................................................... 56
Arts and technology ..................................................................... 58
Late Intermediate dogs ................................................................. 58
Late Horizon/Inca Period ............................................................... 59
Andean dogs and the conquest of Peru ......................................... 60

5 CASE STUDIES ON ARCHAEOLOGICAL DOGS FROM THE ANDES .......... 63
Methods .......................................................................................... 63
Moche ............................................................................................. 63
Rio Muerto .................................................................................... 66
Omo Dog ....................................................................................... 70
The Curious Case of the Hairless Dog: The Viringo ......................... 70
Pachacamac ................................................................................... 71
Chiribaya Alta ................................................................................ 72
Andahuaylas/Sonhuayo ................................................................. 74
Huanca .......................................................................................... 76
Machu Picchu ................................................................................ 77

6 DISCUSSION: DOGS IN THE CENTRAL ANDES - SOCIAL CONNECTIONS ...... 90

7 CONCLUSION ................................................................................. 97

APPENDIX
A OXFORD STUDY ON ANCIENT DOG DNA .......................................... 101
B COMPLETE LIST OF SAMPLES DISCUSSED ................................... 103
C LAB RESULTS FROM ELLEN LOFARO: SAMPLES FROM THE RIO MUERTO DOG ................................................................. 104

BIBLIOGRAPHY .................................................................................. 106

BIOGRAPHICAL SKETCH ................................................................. 117
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-1</td>
<td>Comparative cranial morphology for Andahuaylas dogs.</td>
<td>79</td>
</tr>
<tr>
<td>A-1</td>
<td>aDNA samples submitted to Oxford study on dog domestication.</td>
<td>102</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1</td>
<td>61</td>
</tr>
<tr>
<td>4-2</td>
<td>62</td>
</tr>
<tr>
<td>5-1</td>
<td>80</td>
</tr>
<tr>
<td>5-2</td>
<td>81</td>
</tr>
<tr>
<td>5-3</td>
<td>81</td>
</tr>
<tr>
<td>5-4</td>
<td>82</td>
</tr>
<tr>
<td>5-5</td>
<td>83</td>
</tr>
<tr>
<td>5-6</td>
<td>84</td>
</tr>
<tr>
<td>5-7</td>
<td>85</td>
</tr>
<tr>
<td>5-8</td>
<td>86</td>
</tr>
<tr>
<td>5-9</td>
<td>87</td>
</tr>
<tr>
<td>5-10</td>
<td>88</td>
</tr>
<tr>
<td>5-11</td>
<td>88</td>
</tr>
<tr>
<td>5-12</td>
<td>89</td>
</tr>
<tr>
<td>6-1</td>
<td>96</td>
</tr>
<tr>
<td>7-1</td>
<td>99</td>
</tr>
<tr>
<td>7-2</td>
<td>100</td>
</tr>
</tbody>
</table>

*Figure 4-1: de Ayala’s print of an Inca herder and dog.*

*Figure 4-2: Guaman de Poma on his way to Lima with dogs.*

*Figure 5-1: Map showing case study sites.*

*Figure 5-2: Presentation Theme Vessel (Sanchez et al. 2009).*

*Figure 5-3: Roll-out of image on vessel in Figure 5.2 (Alva and Donnan 1993).*

*Figure 5-4: Deer hunt with spotted dog (Sanchez et al. 2009).*

*Figure 5-5: Deer hunt with black and white spotted dog (Archivo Museo Larco).*

*Figure 5-6: Anthropomorphic dog warriors, Museo Larco.*

*Figure 5-7: Rio Muerto dog mummy.*

*Figure 5-8: Erupting permanent premolar on Rio Muerto dog.*

*Figure 5-9: Organic material and twine ‘wrapping’ Rio Muerto dog.*

*Figure 5-10: Canid cephalic index.*

*Figure 5-11: The viringo, or Peruvian hairless dog.*

*Figure 5-12: One of the Chiribaya dog mummies (Atwood 2007).*

*Figure 6-1: Dog morphotypes on display at Pachacamac.*

*Figure 7-1: Lord of Sipan (National Geographic).*

*Figure 7-2: Ancient dogs of Peru-Moche, Rio Muerto, Omo, Viringo, Pachacamac, and Chiribaya dogs (clockwise from top left).*
As noted by Brothwell over thirty years ago, “[archaeological] remains of dogs have been discovered in Peru for over 100 years, but relatively little information is available on them” (Brothwell 1979:139); this situation is little changed in the ensuing decades. Although dog remains have been uncovered in their hundreds, perhaps thousands, no synthesis exists of their cultural context and meaning geographically and temporally. Andean collections in both Peru and in North America remain little studied, yet hold much important information on not only the dogs themselves, but on their related human counterparts as well. Dogs were in some cases restricted as status items in the same way as precious metals and vicuña cloth and other forms of wealth were in the Inca Empire, reserved for persons and families of status. In early European contexts, “an important function of the graves...is to indicate the status of the deceased” and “high numbers of dogs in a grave reinforce the argument that an important function of the animals was to demonstrate status or prestige”; the authors conclude that “the dog burials were grave gifts...to mark the prestige, importance, and wealth of the deceased.” (Prummel 1992:151,157; Bennett 1989) The status of the dog developed over time; from earliest archaic dogs that may have been hunting companions or camp...
followers, the dog’s status changed as human societies became sedentary and stratified themselves. As the various cultures of the Andean diaspora become more complex, with larger populations, bureaucratic governance, monumental architecture, complicated trade practices, and multivariate social networks, so does the place of the dog become more complex itself. This dissertation elucidates the social role of the dog in ancient Peru as an artifact through archaeological and iconographic interpretation. Through the use of case studies, I investigate these various niches made by and for dogs in the societies of the ancient Andes. Dogs were important as status symbols, as companion animals, as sacrifices, psychopomps, and as exotic belongings. The dog occupies a dichotomous role in most societies, and the ancient Andes are no exception. The role of dogs through time and space in the Andes shifts in meaning, but is always multivariate in the human societies it inhabits. It does appear that the diversity of dog breeds and differing morphology increases over time in the Andes, as do social systems; from earliest generalist type dogs to the diversity of size and conformation found at pre-contact Pachacamac, dog become increasingly varied, as do social systems.

The large numbers of dogs available for study are a neglected archaeological resource, and one that can provide a wide variety of information on human life and cultures in ancient Peru.
CHAPTER 1
INTRODUCTION

Through 30,000 years of domestication, dogs have acquired unique adaptations and behaviors that led to status as non-human individuals in cultures globally. In ancient Peru, this unique place in human society was expressed by using the dog as a symbol of status and social rank in burial and iconographic contexts. The place of symbolism in culture has long been explored in anthropological terms by Levi-Strauss (1963), Turner (1967), and Douglas (1970) (see Moore 2009). Status, in the most basic sense, “is the position or rank of someone or something when compared to others in a society, organization, group, etc.” (Merriam Webster 10th ed. 1999) By anthropological definition, “a status symbol carries categorical significance” and “may also carry expressive significance; it may express the point of view, the style of life, and the cultural values of the person” who makes or owns it. (Goffman 1951:295) In archaeological contexts in Europe, “dogs are considered to have a unique relationship with humans, and the size, treatment and placement of these animals confirms their special status.” (Mulville 2012:220) This status may not be of a strictly intrinsic economic or commoditized nature. Dogs were not part of a “staple finance” or “wealth finance” system, where they would be used as “obligatory payments in kind to the state of subsistence goods such as grains, livestock, and clothing... that have established values.” (D'Altroy and Earle 1985:188) It is not my belief that dogs in general were necessarily commoditized, as were crops, cloth, and mit’a labor, or that dogs occupied a position as goods in economies of verticality (Moseley 2001:44-45). It is my hypothesis that dogs were restricted as status items in the same way as precious metals and vicuña cloth and other forms of wealth were in the Inca Empire, reserved for persons and families of
status. In early European contexts, “an important function of the graves...is to indicate the status of the deceased” and “high numbers of dogs in a grave reinforce the argument that an important function of the animals was to demonstrate status or prestige”; the authors conclude that “the dog burials were grave gifts...to mark the prestige, importance, and wealth of the deceased.” (Prummel 1992:151,157; Bennett 1989) The status of the dog developed over time; from earliest archaic dogs that may have been hunting companions or camp followers, the dog’s status changed as human societies became sedentary and stratified themselves. As the various cultures of the Andean diaspora become more complex, with larger populations, bureaucratic governance, monumental architecture, complicated trade practices, and multivariate social networks, so does the place of the dog become more complex itself.

As noted by Brothwell over thirty years ago, “[archaeological] remains of dogs have been discovered in Peru for over 100 years, but relatively little information is available on them” (Brothwell 1979:139); this situation is little changed in the ensuing decades. Although dog remains have been uncovered in their hundreds, perhaps thousands, no synthesis exists of their cultural context and meaning geographically and temporally. Andean collections in both Peru and in North America remain little studied, yet hold much important information on not only the dogs themselves, but on their related human counterparts as well.

This dissertation elucidates the social role of the dog in ancient Peru as an artifact through archaeological and iconographic interpretation. The large numbers of dogs available for study are a neglected archaeological resource, and one that can provide a wide variety of information on human life and cultures in ancient Peru. This
work complements previous, more extensive studies on Andean domesticates such as camelids, guinea pigs, and ducks. (deFrance 1996, 2009; Stahl 2005; Wheeler 2012) Chapter 2 examines the unique biology of the dog as it relates to humans. Chapter 3 discusses the dog in various social contexts, using ethnographic and historic accounts. By examining the dog and its social importance in other cultures of the Americas, trends and the various functions of dogs; as companions, food, working dogs, psychopomps and ancestors, considered sacred and profane, the complexity of the place of the dog as a non-human person in human societies is seen to be multivariate, as it is in the Andes. Chapter 4 examines examples of archaeological dog remains and dog iconography from differing temporal and geographic contexts in the Andean region to track changes in dog morphology and use, and to follow these changes in archaeological contexts and functional differences. Chapter 5 utilizes nine case studies from various contexts to depict the multivariate nature of archaeological dogs in the Andes. Chapter 6 discusses the connections between ethnographic examples, archaeological samples, and iconographic evidence to prove the place of the dog not only as a status symbol, as at Moche, but the other possible functions and symbolic meanings of what it meant to own a dog in ancient Peru. I conclude with final thoughts in Chapter 7. Through this research, I show that the dog in ancient Peru, through differing temporal and geographic contexts, inhabited a special place in society, conferring special status on their human owners.

My initial goal for this study was to investigate the place of the dog as a symbol of status in ancient Peru; this hypothesis was largely based on a paper I wrote describing the dogs depicted in Moche art and buried in spectacular Moche tombs.
These particular dogs were status symbols, depicted as the companions of gods and conferring this status on human rulers. However, the diversity of environments and cultures of pre-Columbian Peru are far too widely placed socially and geographically to generalize. The term status itself is problematic; while the image of the dog in Moche appears to be closely related to status, it is a social status recognized by a large part of the population. The small dog buried at Rio Muerto, and those buried with women at Machu Picchu also had status, what I would call familial status. Although perhaps not displayed in ritual or depicted in high status art, they were valued members of human families, as indicated with the care with which they were buried and the context of their interment. The same applies to the dogs at Chiribaya Alta; while there is debate as to function, they also were buried in status burials, often with rich textiles. They were valued.

All of the above case studies clearly illustrate that dogs are to be considered as artifacts, produced by and imbued with meaning as material culture, not fauna. The dog occupies a dichotomous role in most societies, and the ancient Andes are no exception. The role of dogs through time and space in the Andes shifts in meaning, but is always multivariate in the human societies it inhabits. It does appear that the diversity of dog breeds and differing morphology increases over time in the Andes, as do social systems; from earliest generalist type dogs to the diversity of size and conformation found at pre-contact Pachacamac, dog become increasingly varied, as do social systems.
CHAPTER 2
WHY ARE DOGS SO IMPORTANT? DOG DOMESTICATION AND THEIR BIOLOGICAL ROLES

In this chapter I review the biology of the dog, the debate over dog origins, the history of the study of dogs, and the unique biology of the dog as it relates to humankind. Dogs were the first domestic partners in the human endeavor, preceding any other domestic animal. The study of the temporal origin of the domestic dog has been a complex process, and the dog’s taxonomic identification itself is being challenged in view of genetic and allometric analyses of the last two decades. (Belknap 2011; Brothwell et al. 1979; Clutton-Brock 1984; Druzhkova et al. 2013; Frantz et al. 2016; Grimm 2016; Larson et al. 2012; Leonard et al. 2002; Morey 1992, 2010; Savolainen et al. 2002; Shannon et al. 2015; Snyder and Moore 2006; Thurston 1996; van Asch et al. 2013; Vila et al. 1997; Wayne 1993) It has been accepted by many researchers recently that the taxonomic binomial be changed from the familiar *Canis familiaris* to *Canis lupus familiaris* because of their close genetic association with the various species of wolves. (Savolainen et al. 2002) The debate over the taxonomy of the domestic dog continues because of their very close relationship with the wolf. “The domestic dog is an extremely close relative of the gray wolf, differing from it by at most 0.2% of mtDNA sequence. In comparison, the gray wolf differs from its closest wild relative, the coyote, by about 0.4% of mitochondrial DNA sequence”. (Wayne 1993:220) The debate on the origin and provenance of the domestic dog is still a topic of debate and inquiry. (Shannon et al 2015; Grimm 2016; Frantz et al 2016) The exact timing of the split between wolf and dog is complicated by many factors, especially considering that dogs, wolves and coyotes are capable of interbreeding at any point in time, with admixtures occurring with some frequency. The other challenge archaeologically is that
allometric differences in wolf and large dog crania and post skeletal remains are difficult to identify. Darcy Morey, a widely acknowledged expert on ancient dogs, states that “the bones of large, morphologically generalized dogs are so similar to those of wolves that sometimes it is difficult to distinguish them, despite the availability of several useful osteological guides”. (Morey 2010: 39) Still, based on metric and genetic evidence, it is generally agreed “that dogs derived from the gray wolf, and this process may have started as much as 15,000 years ago.” (Snyder et al. 2006; Savolainen et al. 2002; Vila et al. 1997) Possible candidates for the specific wolf species that split to form dogs include *Canis lupus chanco*, a smallish wolf species native to China and East Asia. (Savolainen et al. 2002) If this particular species is indeed found to be the progenitor of domestic dogs, the timing and geographic location make an interesting parallel with the origins and timing of migrations of peoples who were destined to populate the New World. A paper published in March 2013, the “Altai dog” was identified in southern Siberia based on DNA from a fossil tooth, and dates to 33,000 years BP. (Druzhkova et al. 2013) The earliest proof of dogs in North America dates to c. 9,000 years ago, a radiocarbon date determined from a human coprolite. (Belknap 2011)

Some phenotypical characteristics of canine domesticity become apparent over time. A general reduction in body size from the wolf, a shortening of the facial structure, and crowding of teeth become common with domestication. According to Morey, “(it) is frequently observed that changes in cranial morphology appear to reflect *paedomorphosis*, or the retention of juvenile characters into adulthood.” (Morey 1992:182) Overcrowded teeth in dogs is a reflection of smaller body size selection: “it seems that tooth size changes have lagged behind skull and body size changes in
rapidly evolving domestic dogs”, and smaller jaws still have to hold large numerous teeth. (Morey 2010:24) We recognize the characteristics of neotony in many modern lapdogs, which exhibit small body size, large, wide-set, forward-pointing eyes and shortened ‘puppy-like’ faces. These changes are most likely the product of human selection and preference, as dogs “that remained dependent on their substitute parent, the human owner, and had the large eyes and appealing form of a puppy would be favored.” (Clutton-Brock 1984: 205)

Ideologically, dogs are the link between nature and culture. The concept of a canine “umwelt” is an important idea when understanding the connection between people and dogs. Developed by Jakob von Uexküll (1934, 2010) and expanded on by Deely (2001), this relates to how animals view and understand their world. If, as some suggest, dogs have been involved with humans during 30,000 years of domestication, the dog has come to understand humans in a unique fashion. Hand-reared dogs can read human non-verbal communication at only six weeks of age. To ancient peoples, their perception and reactions must have imbued them with superhuman senses.

Today, dogs are used to find drugs, weapons, and lost hikers as well as detect cancers and sense impending seizures; they are, in some ways, literally super-human. In this case, it is notable that humans have 6-10 million olfactory receptors; a German Shepherd has 150-220 million, giving it the ability to detect scents far beyond the ability of a person. “A dog’s sense of smell is many orders of magnitude more sensitive than a human’s. This is largely due to anatomical, physiological and genetic differences that allows dogs to more effectively collect, sample and cognitively process chemosensory information from their environment. The dog’s partnership with humans evolved in part
because man (sic) wanted to take advantage of the dog's keen sense of smell to aid his own needs." (Bamford 2012:2) Today, dogs are used as autism therapy, to assist the handicapped with mobility issues, to treat PTSD, as sight guides for the blind, to detect seizures in their humans, to detect drops in sugar levels in diabetics, to assist in mental health issues, as service dogs for the hearing impaired, to detect allergens for people with severe allergies, and as service dogs for people who are sick or grieving. Dogs in the ancient world were seen as mystical beings, with abilities beyond their human owners. (see James 2006, for example) We now acknowledge these abilities, and many people continue to depend on dogs for our health and well-being.

Due to the long association of dogs and humans, this relationship may have basic biological repercussions. In a study on the effect of canine contact with humans, our basic outlook on life may be affected by dogs and our hormonal reactions to them, particularly among women. “Serum oxytocin levels increased statistically more for women who interacted with their dog when compared with women in the reading condition (p = 0.003). There was no significant increase in oxytocin level in men after interaction with the bonded dog compared with the reading condition; in fact, male oxytocin levels decreased after both the dog and reading conditions. These results suggest that men and women may have different hormonal responses to interaction with their dogs.” (Miller 2009)

Although many of the above statements describe dogs in a general sense, the idea that the selection for differing morphologies, or “breeds” of dogs began in “the Victorian era” (Homans 2012:167) is misinformed. All ancient cultures that bred dogs selected for particular characteristics and morphologies. Moreover, these phenotypes
were often markers associated with particular cultures, ethnicities, geographic locations, and identity. Further examination of the process of human selection on canines will follow in the sections on Old and New World dogs.
CHAPTER 3
WHY ARE DOGS SO IMPORTANT? DOGS IN SOCIAL CONTEXTS

The enduring relationship between people and dogs over thousands of years has been based on a social relationship between species, and the perception of canids as unique may long predate domestication. At the Paleolithic site of La Grotte du Lazaret in France, dated to 125,000 years ago, “wolf skulls appear to have been set at the entrance of each dwelling”, perhaps indicating an early form of canid veneration. Louis Binford disputed this interpretation of the site, and its context remains uncertain. (Thurston 1996:3) The true sociocultural indication of dog domesticity would become apparent with the practice of burying dogs, often as companions of humans, in formal graves.

Dogs have been a part of human cultures for millennia; they are a product of culture, yet still a part of nature. They have been described as “neither person nor beast...about as close to being considered a person as a non-human animal can be.” (Morey 2006:165) They are the earliest species to be domesticated by humans, and yet their origins as domestic companions remain shrouded in mystery. Dogs inhabit every continent that humankind does, and have served humans in diverse and multiple ways. The interment of dogs, both with and without humans, both sacred and profane, is a pervasive practice globally, which has brought the study and interpretation of this ancient relationship to the notice of archaeology. (Bennett 1989; Prummel 1992; Thurston 1996; Walker et al. 2005) Dog burials are not unique; they are ubiquitous, and have been found archaeologically worldwide. (Morey 2010)

Function is an important factor when considering the place of the dog in society. Throughout their history, dogs have served a variety of functions. As working dogs, war
dogs, dogs as trade items, and dogs as symbols of status have all played a role in human history. They are psychopomps, guides to the afterworld; they serve as food for ritual and food for survival, companions and pets, and guards of home and family. As we will see, dogs in human society are revered and reviled, but ever present and serving many functions.

My discovery, many years ago, of the seminal work “A History of Dogs in the Early Americas” by Marion Schwartz (1998) shaped and influenced my interest in dogs and archaeology. In it, Schwartz “examines the diverse statuses and roles of dogs among Native American and colonial societies throughout the Western hemisphere from prehistory to the present.” (Kerber 1998:362) Schwartz includes a twenty-eight-page bibliography, accessing “chronicles, ethnohistoric accounts, archaeological data, myths, and drawings and photographs” (Kerber 1998:362), while acknowledging that much material could not be presented in one slim volume; the story of the relationship between dogs and humans is complex and diverse as are human societies themselves. Schwartz also introduces ideas on function, discussing the dichotomous view of dogs as sacred and profane; as psychopomps, guides in the afterlife, and how the dog was portrayed in pre-Columbian art, all topics germane to my research. As Kerber noted regarding this work, “the history of dogs in the early Americas provides important insight into understanding part of our complex past.” (1998:362)

When Columbus first landed in the Caribbean, he made note of the canine inhabitants: “small dogs that did not bark but rather chortled howled or whined. The Taino...called this mute dog aon.” It was during an ensuing famine among the European explorers in 1494 that “the Spanish consumed so many of these dogs that the
The Spanish did not realize that they were encountering cultures that had been thousands of years in the making, cultures that had been long accompanied by their dogs. While we assume that dogs accompanied the first migrants to the Americas, there is little archaeological evidence of their presence in earliest Paleoindian times. Dog remains from Danger Cave in Utah, dated between 9000 and 10000 B.P., “are the oldest well-documented remains of domestic dog from North America”, although all the early dog burial dates appear in current literature with a caveat. (Morey and Wiant 1992:225) Many of the earliest dog burials were discovered before radiocarbon dating, and appear to have been dated comparatively. A recent more securely dated discovery in Texas may also indicate the presence of dogs as early as 9,400 years B.P. (Belknap 2011)

Later evidence for the dogs of the New World is ubiquitous. South American cultures recognized the dog as ancient companions and resources, representing them in art and ritual (deFrance 2000). The stresses of early agriculture adoption may be reflected in the appearance of canine remains in Ecuadorian food middens as early as 3000 B.C. (Schwartz 1997:71-2), and dogs figure in the culture histories of all the Pacific coastal peoples of South America. Specific breeds were used for herding the domestic camelids of the Andean region and are referred to by early European invaders. (Schwartz 1997: 55) The dog as psychopomp appears interred with humans at Sipán in Peru c. 1000 years B.P., and in southern Peru among Chiribaya human burials from between 1100 and 650 years ago. (Morey 2010:160-1) The Moche and Nazca produced zoomorphic ceramics in the form of black-and-white spotted dogs, and dogs also appear in woven and metal artifacts often included in burials. (Schwartz
There is copious evidence for the place of the dog as psychopomp in Central America. Maya iconography depicts dogs who “occupy Xibalba, the scary watery world through which the soul must struggle to emerge safely on the other side.” (Schwartz 1997:100) In the Valley of Mexico, the “Aztec cremated a dog to be sent with the dead one to serve as guide for the journey” (Schwartz 1997:102), and believed that the dog would take the human soul “across the place of nine rivers in the place of the dead” (Schwartz 1997:93), the tripartite association of the dog, water, and the afterlife is a recurrent theme in Native America, and will appear in the Southeastern Archaic as well. The dog was also critical to the most sacred of Aztec rituals, the annual renewal rite called the *toxiuhmolpilli*, or New Fire Ceremony. Aztec legend relates that “the very first fire was started by the only (human) couple left after the flood at the end of the fourth sun; they were then turned into dogs”. During this ceremony of renewal, every fire in the empire was extinguished, to be rekindled with a flame from the ceremony. Held every 52 years at the termination of the ‘calendar round’, the ceremony is depicted in the Codex Barbonicus, with each of the four participants carrying a blue dog. The Aztec believed that if this ceremony was not performed properly, the present world (the fifth sun) would end. (Schwartz 1997:139-140) Like many other ancient people, the Aztecs believed the dog was a psychopomp, a guide to the Underworld, a vital part of the ritual practices of death and renewal.

The most striking example of canine psychopomp iconography in Mesoamerica comes from western Mexican states. In Sinaloa, Nayarit, and Colima, “75 to 95 percent of Colima (culture) tombs contained ceramic dogs”, and although some have interpreted these pottery sculptures to represent food offerings to the dead, “the fascination that
Colima people had for dogs seems to hinge on their abilities as otherworld guides.” (Schwartz 1997:110) Thousands of ceramic dog effigies have been collected in western Mexico (see Schwartz 1997). At nine estuarine sites in Sinaloa, 67 dog burials have been found that date from A.D. 700 to 1300, and dog burials with humans occur from Teotihuacan in the Valley of Mexico to Kaminaljuyu in Guatemala (Schwartz 1997). In modern Mexico, the hairless dogs called Xoloitzcuintli, associated with the dog-headed Aztec god Xolotl, is still used in traditional folk healing practices. The ritual importance of the dog to cultures throughout Mesoamerica is pervasive and ubiquitous.

Dogs of the Caribbean have been mentioned above with the unfortunate fate of the aon at the beginning of the conquest; it is possible that there were at least two distinct breeds of dog in the Caribbean by the contact period, the small aon and a slightly larger dog used for hunting. The canine teeth of these larger dogs are often found “perforated and used for men’s necklaces” found in burial contexts. (Schwartz 1997:76) The Taino believed in a dog zemi, or spirit, called Opiyél-Guaobirán, a guard dog who “sat at the edge of a lake and controlled access both in and out of the dark realm of the nonliving.” (Schwartz 1997:98) The dog, water, and the afterlife; the dog appears yet again in the form of a psychopomp.

In North America, the dog is seen consistently in the post-Paleoindian archaeological and ethnographic record as well. Ancient dog burials occur at the Braden site in Idaho (c. 6600 B.P.), at Port au Choix in eastern Canada (4000-3700 B.P.), and at many other later sites across the continent. (Morey 2006:160) Naturally mummified dogs have been found with human burials at White Dog Cave in Utah that date to around A.D. 100. (Schwartz 1997:107) Dogs were used for hunting,
companionship, guarding camps, a fiber resource for weaving as well as ritual or emergency food sources. (Schwartz 1997; Thurston 1996) Dogs were also used as pack animals by most North American Plains tribes. Coronado describes a group of Haxa Indians in Texas on the move in 1540, travelling "like the Arabs, with their tents and troops of dogs loaded with poles and Moorish pack saddles and girths." (Thurston 1996:158) Even after the adoption of the horse in historic times, so emblematic of the Plains peoples, the dog played an important role in Plains society as a pack animal. Nineteenth century painter George Catlin describes thousands of Plains Indians moving their village, with the men on horseback leading the women, who were accompanied by hundreds of pack dogs and their belongings. (Thurston 1996:158-9) Buffalo Bird Woman, a North Dakota Hidatsa, related that "dogs were bred, owned, raised, trained and sold by women only" over 100 years after the introduction of the horse. (Snyder et al. 2002: ix)

The archetypical pairing, or moiety, of the sacred woman and dog is deeply rooted in Cherokee tradition. Ethnographies, Jungian and depth psychology, mythological motifs from Eastern Woodland religions, Christianity, Judaism and Zoroastrianism, as well as the structuralism of Claude Levi-Straus can be used to elucidate the complex symbolism and importance of the dog archetype as experienced by the Cherokee. (James 2006) “Archetypes are accepted as fundamental structures of the human psyche and religious life which express sacred meaning”, and many early cultures “regarded animals as significant religious beings whose purpose and destinies are cosmologically bound to the teleology, or ultimate end, of humanity and the earth.” (James 2006:17) This interdisciplinary approach to the interpretation of animals as
symbols can do much to inform the archaeological record of dog burials in the
Southeast.

The Cherokee are an Iroquoian group who originated in the Northeast and
migrated to their historic Appalachian homeland. Their relatively recent migration is
attributed to pressure from competing Delaware people, but Cherokee language, culture
and mythology retained ties to the Iroquois. The term ‘Dog Tribe’ was applied to the
Cherokee as an epithet by a Jesuit missionary in 1753, and probably refers to the White
Dog Ceremony practiced by most Great Lakes tribes into historic times, where a white
dog was sacrificed at the New Year. (James 2006:21) That the term was linked to the
Cherokee reflects their continued veneration of the dog spirit into the historic period.

Cherokee legends concerning the Great Mother also relate to the ‘Earth-Diver’
myths common in the East, and in them she is most often accompanied by a dog,
archetypical moral guardian, spiritual guide, and companion to the Cherokee. The
“sacred dog is associated with behavioral norms, and the soul's journey to the spirit
world.” (James 2006:28) The dog as psychopomp appears in the narratives cited by
James, sometimes influenced by the Judeo-Christian tales of missionaries, as with the
tale of the great flood, where a dog sacrifices himself to save humanity. The dog is
seen as a sacred being that “appears at the threshold between chaos and order, and
the spirit world and hell.” (James 2006:30) The sacred dog creates the Milky Way, the
path to the spirit world, from corn meal, and the ‘dog stars’ Sirius and Antares represent
dogs who guard the path of souls on opposite points of the sky, where the Milky Way
touches the horizon. (James 2006:32)
The figure of the sacred dog is also deeply rooted in Cherokee traditional healing practices, as evidenced by ethnographies recorded into the nineteenth century. Rheumatism was perceived as a malady sent to disrespectful hunters by the animal spirit of Little Deer. Prayers to the dog spirits of the four directions are accompanied by the consumption of four medicinal plants; the shaman prays to the dog, the natural enemy of the deer, “to come and drive out the deer spirit”, and cures the patient. (James 2006:34)

The sacred dog complements the fertility of the Great Mother; the dog represents the male component of rebirth and renewal, as the psychopomp represents not only death but renewal and rebirth. Images of dogs copulating (symbolizing regeneration and renewal) on Cherokee stone pipes were considered “too erotic for publication” by one researcher in the twentieth century. (James 2006:34) Dogs are also associated with witchcraft, and dogs were given “witch medicine” to give them the ability to detect witches, especially at funeral rites, where the soul of the dead was vulnerable. The “old woman of the hearth fire” and the dog are protectors of the Cherokee and their homes from witches, disease, death and chaos. (James 2006:35)

Syncretic structures define the dog as a major symbolic entity, a hermeneutic device that recalls the male in the sacred feminine equation, as well as moral and religious authority. The dog is a psychic code, personifying the sacred feminine. The dog is a cultural icon, guardian to the sacred woman, a metaphor for spiritual wholeness that reconciles the opposing forces in life. It is a cultural symbol encoding morality and ritual conduct toward the feminine hearth and the sacred feminine plant, corn. The dog and the spirit woman establish order, harmony, and balance in this world and the next.
The dog is a rich textual symbol, a metonymic device referring to the sacred woman. “Wherever the dog is, the sacred woman is also.” (James 2006:39) The ethnographic and ideological relationship between women and dogs in the Andes will be discussed below.

Multivariate lines of evidence illustrate the complex nature of the dog as a symbolic archetype to the Cherokee, retained even after years of missionization by Christians. The Cherokee migrated from a northern clime, arriving in the Southeast with their suite of cultural beliefs intact, with their dogs and their dog spirits. The same processes could have occurred in earlier times, with other migrating people, as in the Andes.

The domestic dog has been perceived as an integral part of the culture of Eskimos since the first European contact. Described as “half-tame brutes” possessing the blood of the wolf and the “taint of the jackal”, they were seen as quite different from the domestic pets of civilized Victorians. (Walsh 1898:121) They were used for “drawing sleds, packing loads, locating breathing holes maintained by seals in the sea ice, holding muskoxen in their static defensive formation during the hunt, warning of camp intruders, and serving as a source of fur and food.” (Arnold 1979:263) Dogs along Smith’s Sound were observed assisting in bear hunts, and would “corner the largest grizzly and hold him at bay until the hunters could shoot him...[one dog was] powerful enough to bring down a reindeer.” (Walsh 1898:123) With their heightened sensitivity to sight and smell combined with their high adaptability, they were necessary partners in the survival of many Inuit groups. Dogs provided the only alternative to human labor, an “integral part of cultural adaptation to the arctic” before the advent of snowmobiles.
Lastly, Eskimo dogs could have been a last resort food resource in an environment where starvation was an ever-present danger.

The Eskimo dog’s life was hard. They were fed poorly, if at all; used a pack and draught animals, the “huskie” dogs of Alaska could draw five hundred pounds, with a winter diet consisting of “forty frozen herring a day or one large salmon”; in some seasons, dogs would go without food for two or three days. (Briggs 1970:46; Walsh 1898:122) The Eskimo dogs were treated severely, their “tempers soured by the hard lessons of training they have to undergo when young.” (Walsh 1898:122) Briggs (1970) observed that “all the Utku beat their dogs; they saw it as a necessary disciplinary measure: ‘We all do it; we know it makes the dogs behave; everybody knows it,’ they emphasized for justification.” (46) She observed dogs being beaten with “boots, rocks, frozen fish, hammers, tent-poles, or anything else that came to hand, and as the dog was usually chained or harnessed, escape was impossible.” (Briggs 1970:46) The normally reticent and sedate Eskimos at the mouth of the Back River near Hudson Bay were sometimes transformed in their acts of cruelty: “I saw gleaming eyes and smiles of delight as dogs cowered and whined with bruises and bloody heads. I also saw a woman’s face absolutely set and expressionless as she pounded and pounded a thieving dog from a distance of two or three feet with a boulder, which she picked up and threw again every time it bounced of the animal’s ribs.” (Briggs 1970:46)

The dog was a valuable partner in survival in harsh Arctic environments. Considering the evidence presented above from both ethnographic and archaeological contexts, some initial assumptions may be made regarding the dog and its place in arctic cultures now and in the distant past. Morey states that when considering the dog
and its place among the Thule, “the roles played by dogs...encompass the entire realistically imaginable spectrum of roles for those times”, from emergency food source to children’s toys. (Morey 2010:148) The evidence for the harsh treatment of these partners in survival, both archaeologically and ethnographically, leaves the social bond between man and dog in the arctic is in some question. As mentioned above, the dog does play an important role in ethnographic studies, and based on the archaeological record, probably did as well in the distant past.

In her discussion of animals and agency in ancient Alaska, Erica Hill points out that “prey animals, including bear, walrus and whale, were perceived as agential beings who interacted with humans as persons; they were sentient social equals capable of deciding whether to favor humans by allowing themselves to be taken.” (2011:420) Human hunters were conscious of this relationship regarding prey, which are wild entities not under the control of humans. It is possible that this perception did not apply to the domestic dog, whose role is one of subservience to man if the ethnographic and archaeological records are considered. The domesticated dog was not a “social equal”, but a social inferior. Unlike their Athabaskan neighbors in the subarctic, the Inuit did not consider the dog as a possible ancestor or relative either. The regular abuse of dogs did not carry any social or ideological stigma. The widespread observation of the Eskimo people as even-tempered and docile may be in part due to the availability of the dog as a whipping post, a necessary outlet for social frustration in the tightly controlled emotional environment of arctic camps. The unfortunate dog was left between a rock and a (frozen) hard place; their survival in the arctic was dependent on their human masters.
A wide variety of stressors affect the people of the arctic; cold, lack of sunlight for much of the year, variation in circadian cycles, nutritional deficiency, disease, seasonally uncertain food supplies, and a deep social interdependence all contribute to a powder keg of pressures. Psychological strain may be exacerbated by hypocalcemia and hypervitaminosis, but either way the end result is a state of extreme stress sometimes resulting in hysterical episodes. I would posit that the presence of animal abuse focused on dogs may be a necessary social outlet, providing a scapegoat for the stresses inherent in traditional arctic societies.

Dogs were important to the ritual lives of many Plains and Great Lakes Indians as well. Into historic times, the Sioux, Cheyenne, Pawnee, Hidatsa, Winnebago, Delaware, Assiniboin, Fox, Ponca and Huron had dog ceremonies involving the ritual consumption of dog flesh. (Schwartz 1997) Among the Cheyenne, Pawnee, Huron and many others, the dog was associated with the Aldebaran and the ‘dog star’ Sirius, as well as with the Milky Way. The Iroquois feasted on dog meat before going to war, and equated their enemies with dogs. (Schwartz 1997:83) The Iroquois also practiced an annual sacrifice of a white dog to mark the New Year. According to nineteenth century ethnographer Louis Henry Morgan, this sacrifice involved the highest act of piety, and the spirit of the dog was used “as an instrumentality through which to commune with their Maker” (Morgan 1962:217); the dogs were psychopomps.

The dogs of ancient North America were deeply entwined in the lifeways and ideologies of native cultures, and they were beings of no small importance. Their position in these societies was a dichotomous one. The role of the dog in the New World is a rich history of migration, adaptation and ideology that dogs shared with
humans. Used as pack animals, hunting partners, watch dogs, scapegoats, guides to the next world, revered in myth and sacrificed in ritual, sometimes even consumed as food, dogs are much more than ancient companions. Dogs shared the life ways of the ancient Americas, and can tell us much about their mutual experiences.

In Western culture, the dog was often seen as a prized possession that conferred status on the owner. Although homeless dogs “constituted the lowest rung on the canine social ladder… it was the canines of the elite who were immortalized in classical art and writings.” (Thurston 1996:42) At the annual festival dedicated to the goddess Artemis, calves, goats, and sheep were sacrificed, after which both dogs and their elite owners consumed the meat in a great feast. (Thurston 1996:42) These hunting or chase dogs were often used in hunting drives, where game was run in front of waiting royal hunters, a practice common throughout Europe, North Africa, and Asia. (see Allsen 2002) This practice may have been common among the Moche, and depicted on ceramic vessels, as discussed below.

For an example of the often-dichotomous nature of dogs, we can look to Western literature. In Elizabethan London, dogs were used in bull-baiting, ratting competitions, and dog fighting; they were also bred as lapdogs and accoutrements of the wealthy. In one striking example, dogs are seen to be both reviled and revered: Shakespeare’s King Lear. A variety of animals “are mentioned 133 separate times, mainly in a morally unsavoury relation”; these animals are an example of the use of archetypical kennings; when people “refer to animals in the course of talking about something else, they have at their disposal a whole range of meanings and associations above the literal ones.” (Thompson and Thompson 1987) Tigers are cruel; goats, wrens, and flies are
lecherous; the ass is a beast of burden. Dogs, and in fact canids in general, however, are more complicated; “a hog in sloth, fox in stealth, wolf in greediness, dog in madness, lion in prey.” (3.4.93-94) Dogs are depicted as fawning and flattering: “They flattered me like a dog” (4.6.96-97); used as insults: “You whoreson, you dog, you cur” (1.4.81); “The son and heir of a mongrel bitch” (2.2.22-23); as having a blind, immoral obedience: “Knowing naught (like dogs) but following.” (2.2.80) “It was the habit in Elizabethan times to have dogs...at table, licking the hands of the guests, fawning and begging for sweetmeats with which they were fed.” (Spurgeon 1971) The dog is used to show the unnatural reversal of the human and the animal: “If I were your father’s dog, you would not use me so” (2.2.136-137), and human insanity, the “dog in madness.” Dogs are depicted as lower than human: “Why should a dog, a horse, a rat, have life, and thou no breath at all?” (5.3.307-308) At the same time, and in the same work, dogs are seen as truthful, loyal, friendly, and even a symbol of authority and royal office: “thou hast seen a farmer’s dog bark at a beggar? And the creature run from the cur? There thou mightst behold the great image of authority: a dog’s obeyed in office.” (4.6.155-159) The play shows how we donate qualities to animals in order to get them back as metaphors for people. This dichotomous perspective was voiced by Fray Bernardino de Sahagun when observing the New World dogs of the Nahuatl after the conquest of Mexico: “It [the dog] is a house dweller, a favorite companion, a constant friend that always tags along. It is happy, amusing, a Barker that lays its ears back and wags its tail. It eats all: the flesh of the dead, the revolting, the stinking, the rotting.” (Werner 1999:40)
Sadly, dogs who are seen as status symbols may suffer the same fate as their masters. After the overthrow of the French monarchy in 1789, “life for aristocratic dogs was perilous at best, and many a bejeweled dog of “blue blood” was stripped of its decadent accessories, then stomped, beaten, or bayoneted after their owners were beheaded”; lap dogs, seen as useless to the peasantry, “paid a heavy price for their intimate associations with women, for at the Place de Gréve, toy spaniels, terriers, and hounds were rounded up and burned alive en masse.” (Thurston 1996:94) In the same manner, troops under General Sherman during the American Civil War “killed bloodhounds, the hated slave dogs of the South, and all other dogs they encountered” on the march to Atlanta in 1864. (Derr 2004:159)
CHAPTER 4
ANDEAN DOGS BEFORE THE SPANISH: A TEMPORAL OVERVIEW

This chapter discusses the history of dogs in the Andes, from the earliest endemic South American canids through the introduction of domestic dogs by the first humans. I discuss each temporal period of early history, briefly describing the cultures and arts of the period, and then any dog remains that I have found associated with these geographic and temporal contexts.

Autochthonous Canids of South America

North America was the center of earliest canid evolution, where dog-like animals evolved from civet-like mammals of the Eocene, 35 to 56 million years ago. During the Oligocene, between 37 and 24 million years ago, *Pseudocynodictis*, the “in-between” dog, inhabited North America. (Savage and Long 1986:76) By the end of the Pleistocene wolf-like canids like the dire wolf (*Canis dirus*) were extinct, and our modern taxa of foxes, coyotes and wolves remained in North America. (Schwartz 1997:4) Domesticated dogs, of course, were introduced later with the first Pleistocene settlers in North America.

The ancestors of domestic dogs (*Canis lupus familiaris*) were wolves (*Canis lupus*). (Leonard 2002) Wolves were not present in Pleistocene or early Holocene South America. Members of family Canidae that have been present in South America since the end of the Pleistocene include the culpeo or zorro, a fox which was known under the genus *Dusicyon* but is now known as *Lycalopex culpaeus*. The culpeo enjoys a wide geographic distribution extending from Ecuador and Peru to the southern regions of Patagonia and Tierra del Fuego. Some populations are also found in southern regions of Colombia. It is most common on the western slopes of the Andes, where it inhabits
open country and deciduous forests. Five other *Lycalopex* species have smaller, more specific geographic distributions: Darwin’s fox (*L. fulvipes*), the South American grey fox (*L. giseus*), the Pampas fox (*L. gymnocerus*), the Sechuran fox (*L. sechurae*), and the Hoary fox (*L. vetulus*). Bush dogs (*Speothos venaticus*) and small-eared dogs (*Atelocynus microtis*) are both small canids limited to tropic lowland environments, and the crab-eating fox (*Cerdocyon thous*) is limited to the eastern savannahs of South America. The maned wolf (*Chrysocyon brachyurus*) of the grasslands of east-central South America is not actually a wolf at all; it is not closely related to any other wolf taxa, and may be a remnant of large canids that existed before humans arrived on the continent. (Schwartz 1997:5-6; Stahl 2012:110) Another wolf-like canid, the Falkland Islands wolf (*Dusicyon australis*) was observed by Charles Darwin, and was actually a large fox. The Falkland Islands wolf had no natural fear of humans, and was quickly exterminated. (Riddle 1979:275)

Stahl (2012:109) has suggested that some of these non-dog canids may have formed relationships with humans; the Sechuran fox dominates the faunal assemblage at the early Las Vegas site in Equador, which was occupied from 10,800 to 6,000 years ago. The species is also found in direct association with human remains at the site. Elizabeth Wing (1988, 1989) has also suggested that early humans in South America exercised control over the Sechuran fox. Jeremy Koster (2009) has suggested a similar relationship may have existed between early Venezuelan hunters and the native Bush dog. Domestic dogs may not have been present in tropical lowland Amazonia until 20th century. (Koster 2009; Schwartz 1997:40,163)
In the Andes, the zorro is sometimes “referred to as perro de los machulas (dog of the ancestor spirits)”, and was considered “the younger brother of the puma.” (Schwartz 1997:149) The small foxes may have performed the same role as the coyote in North American belief systems, as the thief and trickster; these roles were “quite distinct from that played by domestic dogs.” (Schwartz 1997:151) “In Andean communities...a fox’s howling predicts the success or failure of the growing season. If howling is heard in October and November, plenty of rain and a good harvest will follow. It was “bad luck for a fox to howl in March.” (Schwartz 1997:149) In later Inca times, the Atoq, or “fox”, was one of the dark cloud constellations that were used to determine seasons and agricultural activities. (Urton 1988: 102,110)

**Temporal and Geographic Contexts for Archaeological Dogs in the Andes**

I summarize the temporal and geographic contexts of the diverse cultures of Peru following Moseley (2001), and include all the dogs discovered in literature reviews, museum collections, and personal observations. The complex cultures of the Andes developed over time to include complicated systems of family and supra-familial regional connections known as ayllus; the people engaged in ancestor veneration and worship of the high peaks and associated holy places called huacas. All along the Andean mountain chain and the Pacific coast people produced monumental architecture unmatched to this day. The populations of the Andes also organized trade, pastoral, and agricultural systems to thrive in some of the planet’s most challenging environments, including the domestication of camelids (llamas and alpacas), cuy (the guinea pig, *Cavia porcellus*) and Muscovy ducks (Wing 1986); dogs of different sizes and types with different functions and places in human society were an essential feature of these different cultures.
The temporal periods are of course subjective, but are a necessary organizational tool to survey the development of Andean cultures, material culture, and their practices. The periods used by Moseley (2001) include the Lithic, Preceramic, Initial/Early Horizon, Early Intermediate, Middle Horizon, Late Intermediate, and Late Horizons, including the Inca period, and the Spanish colonial era. Sites that cover more than one temporal period will be analyzed beginning with the earliest dates.

**Lithic Period 14,000-5,000 BP**

**Colonization**

Humans entered the western hemisphere by way of the Bering land bridge during the last glacial event, arriving at least 15,000 years ago, although some debate has arisen regarding the route taken, land vs. ice free corridor, or by coastal leap-frogging. (Moseley 2001:87) Through the changes in sea level and weather conditions between 15,000 and 5,000 years ago, when sea level and climate were moving toward their current state, people were populating North, Central, and South America. The Andes were covered with ice before 10,000 years ago, but marine resources were easily available on the coast. (Moseley 2001:87) Still, coastal travel could be somewhat risky, as the intensely arid environment had no trees. These people travelled with their only domestic counterpart, the dog.

Tom Dillehay’s evidence at Monte Verde in southern Chile indicates human habitation at over 14,000 years BP. (Dillehay 2015; Moseley 2001:87) The dispersal of humans into the New World has been traced through blood type; four distinct, genetic stocks enter the Western Hemisphere; Paleoindians reach South America but there is no native blood type B in South American natives, and type A is rare; the frequency of type O makes up 90% of the native population. (Moseley 2001: 87) The diversity of
human genetics is less than that of North America, but these first populations led to a wide diversity of cultures and practices in later prehistory. The long trip to South America led to the development of new hunting technologies like the atlatl and the bola, technologies that could possibly have benefitted from the use of dogs to aid in hunting.

**Arts and technology**

The El Jobo/Monte Verde Tradition is identified with the appearance of fluted fishtail lithic points that are similar to Clovis points found across North America. The South American fish-tailed points are also fluted, and have been found at Fell’s Cave, Patagonia in the south and north into Ecuador. Although rare, they indicate human hunting practice and possibly an early system of trade down the west coast of South America. The El Jobo biface points and scrapers have been described as “generic.” (Moseley, personal communication)

Sites in the Paijan tradition “have been given numerous dates between 12,000 and 7,000 years BP (Moseley 2001:93). Paijan artifacts have a limited distribution of long, thin points; perhaps with the narrow stem hafted to reed arrows. The La Cumbre Site is Paijan; located in the Moche Valley, it exhibits a lithic scatter and associateddebitage. (Moseley 2001:94) The Nazca and Lambeyeque Valleys in the south are also Paijan territory.

More “generic bifaces” were produced in the Central Andes at this time, but in the tropical northwest of Peru there is little lithic material, with wood tools and tropical resources predominant. At the coastal site of Quebrada Tacahuay, c. 12,500 BP, there were no projectile points “per se”, but marine birds were being processed. There is one possible net mesh gauge for fishing, reflecting an ancient, uninterrupted maritime tradition. (deFrance et al. 2001; Moseley 2001)
In northern Peru, some of the earliest evidence of plant domestication in the New World exists in the form of gourds at Guitarro Cave, c. 10,000 years ago, as well as a well-established tradition of fiber technologies. (Moseley 2001:104) The process of adapting wild plants and animals was not a conscious effort; moving organisms and altering their placement and appearance injected both human selection and natural selection into the Andean domestication process. (Moseley 2001:103) The mindset of domestication and modification had been established by 10,000 years ago; how would it affect “man's best friend”?

**Earliest domestic dogs in Peru**

The earliest identification of domesticated dog in South America to date was made from the deepest cultural units at Fell’s Cave where dog remains were mixed with two species of foxes and may date to over 9,000 years ago, although the context and date are the subject of some debate. (Stahl 2012:114; Clutton-Brock 1984) Other possible dog remains from the Lithic Period were identified at La Paloma (FLMNH/EA 0300) dating from c. 5000-2950 BC, including one canine [tooth] (FLMNH/EA 0300-0134) identified by Wing as “large enough to be dog rather than Dusicyon sp.”, that was found in house floor fill, as well as a shaft fragment that may have been “dog gnawed” (FLMNH/EA 0300-0243) (FLMNH/EA database). There are also highland dog burials identified at Telarmachay Cave (c. 3200 BCE).

**Preceramic 3000-1600 BCE**

The Preceramic or Late Archaic Period “begins with the abatement of glacial meltback and relative stabilization of sea levels…about 3,000 BC.” (Moseley 2001:107) Plant cultivation on a small scale continued to be practiced, but most people still depended on naturally occurring resources for their sustenance. Fishing communities
on the coast grew cotton (*Gossypium barbadense*), gourd (*Lagenaria siceraria*), squash (*Cucurbita* spp.), beans (*Phaseolus* spp.), and fruit. (Moseley 2001:108) Since the plants grown had specific environmental requirements, the advent of cultivation fed the development of trade between the ecotones and peoples of Peru.

**Arts and technology**

A highly visible change began during this period with the construction of monumental architecture; “during the third millennium BC distinct forms of civic-ceremonial architecture crystallized in tropical, desert, and sierra settings.” (Moseley 2001:117) This organization of human labor is attributed to the development of religious hierarchies, which indicates complex social organization; different *huacas* probably indicate different “constituencies” or social groups. *Huacas* are sacred places, places of worship, or sacred objects. Platform mounds and sunken courts appear as the basis for ceremonial centers, constructed by masses of people, sites of large formalized rituals.

“Every Preclassic plaza was a place for prescribed behavior, every platform mound a place for precise protocol and people consented to expected conduct whenever they built or used a particular facility”; a conformity of behavior and beliefs expressed in construction. (Moseley 2001:118) These massive sites include Kotosh, established in a “sierra-type locality”, La Galgada, started c. 2400 BC in the Rio Santa drainage, Supe, with the “largest prepottery mounds in the hemisphere”, located on desert coast between Rio Chicama and Rio Chillon, and El Paraiso, the largest prepottery masonry monument in western hemisphere, where 100,000 tons of stone were quarried for the nine monuments located 2 km from the Pacific Ocean. (Moseley 2001:120-126)
Preceramic dogs

Although no dog or canid remains were found during my investigation of this period, absence of evidence is not evidence of absence. Dogs may have been present but disposed of outside the areas of domestic or ritual space. Also, there may be deposits containing dogs that are either as yet uninvestigated or destroyed by looting.

Initial Period- c. 1800 BCE-400 BCE

Cultures

The Initial Period begins around 1800 BCE in Northern Peru, and 1400 BCE in Northern Chile, expressing a long tradition of gradual dispersal of people and ideas from North to South along the length of Peru. It is the longest period of cultural development, lasting almost 1,000 years. Populations continued to disperse to higher elevations (there were populations in the highlands during the Archaic), and farming moves from favorable to more hostile environments. Social organization and belief systems begin to adapt to an agropastoralist lifestyle in the highlands, where “Arid Montane” adaptations supported large high altitude populations in the southern upland basins; on the Pacific Coast, “Maritime Oasis” adaptations supported dense populations dependent on fishing and intensive farming of desert riverine environments. (Moseley 2001:131) In both regions, there is demographic growth, a “filling in” of the Andes with populations. Early ayllu corporate organizations develop, and an ideology with solar, lunar, rainfall cycles becomes entrenched in the Andean diaspora. Beliefs develop related to Mayu and water, with apu, the flow of life, with the cycles of the celestial bodies, and with sacrificial offerings. There are more platform mounds from this period than any other, civic/ceremonial centers built to honor the gods. They occur in many forms; U-shaped
ceremonial centers often with asymmetrical wings, the openings of which face away from the coast, looking toward apu, the celestials, and the rising sun.

**Arts and technology**

As the Pacific coast is settled, farmers are cultivating plants for industrial cultigens, medicinals, condiments, and foods that introduce more dietary variation. Farming opens up new habitats, and household gardens grow plants close to home for home use. In the sierra, ‘rainfall civilizations’ farm above 2000 meters; lower slopes require the construction of irrigation systems and runoff farming. Simple spring irrigation expands highland bogs, or bofedales; entrenched rivers along the coast favor stream irrigation and canals. These new farming technologies amplify resource differences and inequalities, and encourage verticality trade between ecotones. With higher plant production, people develop ceramic technology for storage, cooking, and brewing. Textile technologies develop with industrial crops such as cotton and camelid fiber to produce a form of wealth; looms change weaving with the introduction of heddle looms.

The elaboration of production sponsors transport of food in the form of plant products and chuño (dried meat), as well as ceramics and textiles by caravans of llamas. The herds of llama and alpaca also provide fuel and fertilizer for the highlanders. This widespread economic expansion supports population growth; with new lands and more food, social and government stratification becomes more complex.

Social organization along the coast mirrors the multiple river drainages and fosters separation and fragmented ethnic groups. Corporate labor is required in the Andes, and kinship charters, or proto-ayllus, become organized. The arts develop distinctive regional styles in pottery, textiles, and monumental artworks such as those at
Huaca Los Reyes, where ornate facades of otherworldly art are created to impress a large audience.

Initial Period dogs

Dog remains have been identified at Pikicalleppata (FLMNH/EA 0123) dating to 1750 BC-300 AD, including a left radius (FLMNH/EA0123-0078). Dogs were identified at Wishgana (500 B.C.) in the Ayacucho Valley, and coastal Peruvian dogs were buried with ears of corn at Paloma (Benfer 1984). Another dog burial dating to between 1000 and 500 B.C. on the Paracas Peninsula was wrapped in a Chavin-style textile (Engel 1960). Paracas people continued to bury dogs with the dead until 1000 A.D., either wrapped in textiles or sometimes with a rope around their neck. Human captives are also often depicted with ropes around their necks in Andean art. (Schwartz 1997:115) At the Lighthouse Site in the Supe Valley, a rich burial included “the mummified head of a small brown-haired dog”, and in the Viru Valley, the Salinar people “sometimes placed a dog at the dead person’s feet.” (Schwartz 1997:115-116) The Gallinazo culture at Castillo de Tomaval, around the end of first millennium B.C., practiced dog burial; in one case, a yellow haired dog “was wrapped in several pieces of cloth...on a plaited fiber mat” with burial goods, but it was not associated with a human burial. (Schwartz 1997:116)

Dogs are depicted in Peruvian art since Early Horizon times on ceramics, textiles, and in geoglyphs. A “curled-up spotted dog effigy jar” is one of earliest ceramic representations of a domestic dog in Peru, dating to between 700 and 400 B.C. from near the village of TemblADERA in the Jequetepeque Valley. (Schwartz 1997:230-231)

One of the two possible ancient dog breeds arrives from Mexico (van Asch et al. 2013) in Peru during this period; known as the Peruvian Orchid Dog, the Peruvian
Hairless, or the Viringo, these dogs are still highly prized in Peru today. They will be discussed at length as one of the case studies below.

**Early Horizon c. 400-200 BCE**

**Cultures**

The site of Chavin de Huantar was established in the previous period, c. 1000 BCE, before the coastal collapse of c. 900-800 BCE, and inhabited until c. 200 BCE. It is inland and at high altitude, 2700 meters up in Andes, at a strategic bridge crossing. The U-shaped complex exhibits unusual *huaca* architecture, with multiple separate galleries, chambers, drains, and long narrow halls used for votive offerings. It has been suggested that the drains were used to produce sounds, perhaps using flowing water that could be flushed through the temple. (Moseley 2001:163; Lumbreras 1989) The site has an 800-900 year occupation, with old and new temples contemporaneous; there were multiple construction phases, of temples with both rectangular and circular sunken courts. The constructions also exhibit ritual black-and-white axes of stairway and portals, an expression of the ideological duality seen in all following Andean beliefs.

Chavin influence was widespread on the coast; the Chavin horizon can be identified around 400-200 BCE from Chan Chan to Nazca in the south. The movement of commodities such as obsidian, metals, and textiles is seen throughout the region, and may have fostered the emergence of a *kuraka* class.

**Arts and technology**

Chavin iconography is a system of intimidating and complex symbolic communication, with themes of dual organization, predator symbolism with felines, raptors, and serpents, ritual processions with *Strombus* shell trumpets, and supernaturals depicted with pronounced canine teeth in procession around the black-
and-white portal expressing duality. Kennings, or visual metaphors, used to depict deities include feline faces substituted for ankles and body parts, and snakes substituted as whiskers or feathers.

Tenon heads mounted in walls are human and animal iconography; stone plugs in noses show may depict ayahuasca or hallucinogen use. Human and feline forms most common; with processions of birds and felines that may symbolize tinku (define) convergence. In the New Temple complex, spotted cats and humans are shown with San Pedro cactus iconography; the green peel on the outside of San Pedro cactus contains alkaloids that produce mild hallucinogenic effects. Dog images are notably absent.

The black-and-white portal pillars mentioned above are symbols of dual organization; the black side is male, figures are holding two sabres, shown with a phallus, and wings, are on the north; the white side is female, and depicts sabres, vagina denticulata, wings, and are on the south. The same iconography is seen on textiles.

At Paracas, in the coastal south, Chavín influences are seen in later pottery styles that “are attributed to Chavín influence and mark the opening of the Early Horizon.” (Moseley 2001:160) The Paracas necropolis was first explored by Tello in 1927, and had burial vaults, seated mummy bundles, and fancy textiles that indicate a stratified elite with distinct class division elites and commoners. Unlike Chavín, the gods do not appear to play and important part in Paracas iconography.

**Early Horizon dogs**

Examples of Early Horizon dogs are found archaeologically at Rosamachay, c. 200 BCE (FLMNH/EA 0120), the left humerus (FLMNH/EA 0120-0223). Dog remains
are also reported Telarmachay Cave (c. 200 BCE), where a dog was found carefully wrapped in a leather pouch, buried at the base of a wall, and post-dates the earliest dog bone fragment found in the cave by 3,000 years. (Schwartz 1991:119)

**Early Intermediate- 200 BCE to 600CE**

The Early Intermediate Period is more applicable to Northern Peru than the south, and it is here that dogs make their mark on cultural and iconographic traditions. The Early Intermediate is also better defined by archaeological and environmental events, and ice core/glacial lakes cores to corroborate archaeological dates. With population expansion previous to this period, easily exploited habitats are gone, and increased competition caused much conflict; this is the “circumscription theory” posited by Carniero. (1993) The rich iconography of the Moche depicts soldiers kneeling, richly decorated ear spools, and lots of weapons; in southern Peru, heads are collected by the Nazca. In northern Peru, the Moche homeland in the Moche and Chicama Valleys fostered the development of a wide-ranging culture depending on farming and fishing. The northern and southern spheres of influence had a shared ideology and iconography, with fancy artworks, ceramics, metals, lapidary mosaics. These archaeological treasures have fostered an industry in widespread looting since the Spanish arrived, and continues today. Nevertheless, much material survives to inform us.

**Moche culture**

The Moche culture of northern Peru (200 BCE-800 CE) produced some of the most striking artwork of the ancient Americas. Monuments in the form of pyramids and temple complexes decorated with colorful murals are the grandest and most immediately visible of the remains of their civilization, but the art of the Moche found
within these archaeological features are often even more striking. Metalwork of technological virtuo
tsity and fine textiles are found among grave goods, but the Moche ceramic tradition is the most notable element of the fine arts. Found and collected in large numbers, these ceramics “provide the greatest consistency, the longest continuum, and the largest iconographic sample for study.” (Jackson 2008:3)

The Moche appear to have embraced the *kuraka* class ideology, where elites expressed their specific status, rank, and hierarchy with ornately decorated earspools and ear bangles that showed status as well as fancy burials in reality and reproduced in iconography. Artwork had a corporate style, and production of rich goods was controlled by the elite classes. The Moche express religious unity in a multi-ethnic, politically diverse realm. (see Moseley 2001:178-196)

Moche ceramics in particular are evidence of cultural beliefs and production values. The ceramics are found in three dimensional and fine-line painted types; fine line pot themes have multi-subject contexts, social and ideological interactions, and stories of kuraka ideology, ceremonials, processions, burials, and sacrifice. Recurrent characters have been named “Wrinkle-face”, “Iguana”, and “Owl-face”, and most likely depict gods. The Moche produced portrait vases that appear to depict certain specific individuals, some over time. These three-dimensional pots show humans, some may be generic, some portraits. (Donnan 1975) Portraits vessels from the Moche and Chicama Valleys have best representations, but few were excavated in context; most were looted. Some are repeated visages; the vessel’s faces, and heads were made from molds, then embellished; the same molds were used over and over again to produce similar but not identical vessels. Characters such as “Bigote”, with a mustache or
goatee, is a recurring image in different vessel forms, including some where he is as captive; “Nariz”, “the Nose”, is another recurring image, often smiling, but also shown as captive at times. Another recurring character is shown in nine representations, identified by scars on face (“Scarface”); he appears to age through time. (Donnan 1975)

Recurrent images are a consistent component of the Moche canon. These images have been the focus of considerable scholarly attention in an effort to illuminate the world of Moche culture and belief systems. The fine arts may have been created in the service of political and social elite, and “expressed a brilliant, often realistic, iconography that rationalized an ideology of kuraka rule and ritual.” (Moseley 2001:183) Moche fine-line ceramic paintings have multi-subject contexts depicting fishing and sea deities, animal life, and interactive scenes; they also frequently depict scenes interpreted as military in nature, with weapons and weapon bundles, warriors, processions, captured prisoners and anthropomorphic representations (Figure 5-6). The captured warriors are often shown stripped of their weapons and clothing with ropes around their necks, paraded with bleeding faces, and as the victims of ceremonial sacrifice events where blood is collected in cups and presented to elite figures. It appears that the prime focus of Moche warfare was the capture of living subjects for ceremonial sacrifices conducted at Moche centers like Huaca de Luna. Elite iconography unifies the world of the Moche. The Presentation or Sacrifice Theme in particular employs all of these elements.

One Moche vessel in particular has been used to identify and interpret these iconic images of the Moche (Figures 5.1,5.2). Lower right on the roll-out of the vessel shows two warriors cross-legged and nude; their hands are tied behind their backs and
their throats are being cut by figures standing next to them. Upper right in the painting, a figure known as the Warrior Priest accepts a goblet from a bird-faced deity and a figure identified as the Warrior Priestess. The Warrior Priest appears to be the focus of the upper register of the painting, with rays emanating from his head and shoulders, a tumi-shaped ornament on his headdress, ear plugs, nose ornament, a litter, and ceremonial rattle all pointing to his special status in relation to the other figures depicted. In addition to these accoutrements of status, he is normally accompanied by a spotted dog. (Donnan 1988:156) Nuclear and peripheral elements in the painting combine to form “comprehensive narratives”, in which Jackson (2008:138) sees an arrangement of horizontal and vertical narrative sequences. As the spotted dog is a recurring image in these narrative sequences, we can postulate that it carries some visual metaphorical meaning.

**Nazca**

On the south coast of Peru, the Nazca are known for their polychrome ceramics, elaborate textiles and art; rich burials; mummy bundles; and beautifully preserved feathered cloth. The Nazca took trophy heads (in art and as artifacts); their lips were often sewn shut, and they were provided with ropes for carrying. They are relatively common. The Nazca practiced cranial deformation, which may have been an identifier of social class. (Hoshower et al. 1995)

Nazca is probably best known to the world as the home to the “Nazca Lines”. Making the geoglyphs is a simple proposition; sun-fried stone and desert pavement is moved to expose underlying lighter-colored sediment. Although relatively easy to make, the scale of the work is indeed monumental.
These geoglyphs fall into several typologies; best known are the biomorphs or lifeforms that include birds; pelican, hummingbird, and condor; and killer whales (often carrying severed heads as in Moche art), but these make up only about 5% of the geoglyphs. Most are geometric (≥ 90%). They occur on pampas (desert pavement) near irrigated valleys. Thousands of these large-scale artworks exist, and many overlie one another. They were not observed from above until they were discovered from planes in 1930s.

**Pachacamac**

Archaeological dog remains have been found at Cahuachi, a possible pilgrimage center, which may have significance as discussed below regarding Pachacamac; and a “puppy burial” from Wichigana, dated 1750-300 CE, is curated at FLMNH (FLMNH/EA 0204). These represent minor assemblages when compared to the enormous assemblage at the site of Pachacamac. Occupied c. 200 BCE- Contact, the ritual site of Pachacamac was in continual use until the site was sacked by Pizarro’s brother:

“Located near the sea at the mouth of the Rio Lurin, south of Lima, it was the home of a widely respected oracle with a powerful cult following. Drawing pilgrims and devotees from all quarters of the Cordillera, Pachacamac was the most revered city in the Andes...the Incas told Pizarro that the city contained immense riches, whereupon the *conquistador* dispatched his brother and a contingent of troops to sack the sacred center.” (Moseley 2001:17) Although, as Moseley points out, great wealth was not found, the site has produced some astounding archaeological wealth, including the burials of over 100 dogs. (Tibali 2010)

An Inca presence was obvious in sectors of the township of Pachacamac that sprang up after the forces of the Inca ruler Topa Inca subjugated the area in 1465, and the temple complex, dedicated to their sun god Inti, that
straddled a southern hilltop. On the southeastern terrace of the complex, there was a cemetery that was clearly set apart for the burial of the *mamacuna* (Virgins of the Sun), a group of women holding a privileged position in the temple’s services. In life they took the responsibility for the weaving of textiles worn by the priests, and made the corn beer (*chicha*) that figured in so many Inca festivals. In sacrificial death, they were accorded the highest ritual. All these women at Pachacamac had been strangled—many still have the cotton garrote twisted about their throats—wrapped in fine cloth and then buried in stout, stone-lined tombs. Each was surrounded by funerary offerings of foodstuffs that were specific to the Peruvian highlands—coca, quinoa, cayenne pepper—rather than local varieties of plants found at Pachacamac. The aim was obviously to replicate the rituals involving human sacrifice that were enacted every year at the Inca capital of Cuzco. (Fleming 1986:40-41)

Since the Cemetery of the Sacrificed Women is a mortuary, rather than domestic, context, the very few faunal specimens included in the collection are limited to items that were purposefully buried with the individuals. These consist of two mummified dogs and one mummified parrot. The three mummies were too delicate to be examined directly. Several dog burials have been recovered from archaeological contexts; beneath the floors of domestic complexes in the agricultural area around Chan Chan (Keatinge 1975: 223) and at Lo Demás in the Chincha Valley (Sandweiss and Wing 1997:55), and from a Chiribaya mortuary context (as well as at Chiribaya sites near Ilo). (Martinson 2003)

The dogs in association with exotic parrots places them in the same category of valued or status goods. Parrots were not domesticated, and are not native to the arid Pacific coast. Their feathers were an important component in textile production, used for elaborate feathered garments and headdresses. (Reid 2005; Rowe 1984) Mummified parrots have been recovered at the Middle Horizon site of Beringa in the Majes Valley and from Paracas mummy bundles. (Vreeland Jr. 1998: 161) Parrots and other exotic
birds may also have been kept as pets; Guaman de Poma’s illustration of Atahualpa’s wife, Chuqui Llanto, shows her with a parrot and macaw at her feet.

Animal sacrifices are mentioned extensively in colonial documents, though according to informants, only domesticated animals were considered appropriate for sacrifice because human work had been invested in them (Cobo and Hamilton 1990: 113); wild species were used as occasional offerings, however, as Cobo goes on to comment that “the sacrifice of birds was uncommon.” (1990:115) The parrot buried in the Cemetery may have been a live pet of one of the Pachacamac acllas (chosen women), possibly used as a source for featherwork supplies during its lifetime, and sacrificed with the acllas. These three roles are not mutually exclusive. Similarly, the two dogs may have been pets, guard animals, and sacrificial offerings. (Tibali 2010:196-197)

**Early Intermediate dogs**

Dog burials were a component of the lavish burials found at coastal Sipan. Tomb 1 (dated 300 BCE) had a dog interred in it. Tomb 2, the famously rich adult burial, had at his feet an 8-10 year old child, with a dog on top of him and a snake at his feet. (Alva and Donnan 1993; Schwartz 1997; Verano 1997; Alva 2001) This burial will help inform our discussion of the iconographic dog identified in Moche fine-line vessels. The dog also played an important part in ritual and was associated with specific Moche deities; this recurring character will be discussed at length below.

The Nazca geoglyphs also include a dog. It has been suggested that the glyphs were in part petitions for rain. An account from post-conquest Mexico relates the use of hairless dogs in rain ceremonies, where local people fasted and went in processions to the temple carrying hairless dogs that were sacrificed, and “as soon as the dogs died
there was lightning, thunder, and great quantities of rain.” (Muñoz Carmago 1972; Schwartz 1997:153) A pottery tableaux from Nazca does in fact depict a procession, perhaps a family, in fancy dress and carrying five dogs and two parrots. (Schwartz 1997:152) Pilgrimage sites and processions are well documented in ancient Peruvian societies as symbolic manifestations of tinku or convergence at the sites of pyramids, huacas, and apu. I believe the animals in the Nazca model may have been intended as gifts for priests, as exchange items at the pilgrimage site, or even sacrificial victims, but the scene does place the dog as a central participant in the event. Although there are many examples of canids represented in art, most appear to be biased towards the cultures of the north coast, where they are a common design element.

**Middle Horizon 600-1000CE**

**Cultures**

The Middle Horizon marks a period of flux both culturally and climatically. A severe drought c.560-590 CE may have resulted in drastic rainfall reductions; a series of El Niño events. (see Moseley 2001; 243) During the seventh century, aeolian sand deposits result in infilling between the Huaca del Sol and Huaca de Luna at Moche.

At Dos Cabesas in the Jequetepeque Valley, the site is covered with sand and remained uninhabitable for 400 years. The landscape was stripped, and people removed wooden roofs for wood before abandonment. Coastal settlements contract, and the southern branch of the Moche collapses.

During the Middle Horizon, we see the highland radiation of Tiwanaku from the southern altiplano and Wari from the northern sierra. Situated near Lake Titicaca, the Tiwanaku took advantage of fishing the *ispi* (*Orestias cuvieri*) and developing raised field farming to double or more yield on crops. Tiwanaku is noted for its megalithic
features, including the famed Gateway of the Sun, depicting the staff god with winged attendants also seen in textiles at Tiwanaku and Wari; the Akapana, a huge platform mound at Tiwanaku which was looted by the Spanish, had a system of drains in it to direct water through the building; and the Kalasasaya, a sunken court featuring stone tenon heads, some with square hats that identify this cultural group. The site is also famous for its stone monoliths, the Bennett Monolith and the Ponce Monolith, both featuring low relief carving, and the Pumapuncu, the most elaborate platform mound on the site, located 1 km from the Akapana. (see Janusek 2008)

The expansion of Tiwanaku colonies began in the altiplano, with Tiwanaku creeping into the northern shore of Titicaca and the Bolivian highlands, then west to sites in present day Moquegua and Arequipa. Along the drainage of the Rio Osmore and the Moquegua Valley, Tiwanaku settlements were located on mesa tops. At the site of Omo (M10), there is a large sunken court temple, the only one outside Tiwanaku; the site has yielded Tiwanaku pottery and portrait head pots typical of the highland based culture. (Goldstein 2005:111-180; Janusek 2008)

At Cerro Baul, the “Andean Masada”, both Tiwanaku and Wari eventually settled in close proximity. The summit was occupied by Wari, with small structures and monumental Wari structures, a palace, a brewery that had grinding, boiling and fermentation rooms, two-story buildings and D-shaped temples typical of Wari. There was much commensal drinking, and lavish entertainments in palaces that had stone carried from 6km away for floor paving. Occupied for 400 years, when the site is abandoned a wild party ensued, and closing rites included burning buildings and feasting. (see Moseley et al. 2005)
The Middle Horizon Wari and Tiwanaku collapse after 1000AD, and a drought c. 1100 CE brings change and reorganization; iconography changes, and the cult of the staff god disappears as regional and local styles develop. (Goldstein 2008:321) At the Chiribaya-associated sites along the Osmore River Valley, ornate polychrome ceramics reminiscent of Wari and Tiwanaku continue under local influence. (Goldstein 2008)

**Arts and technology**

Middle Horizon influence in arts are influenced by the wealth of hereditary rulers; rich gold artifacts and finely woven textiles are found in their seated, flexed burials. Miniature balsa boats with sails in are found in male graves, and provide evidence of fishing and farming industries. (Goldstein 2008)

**Middle Horizon dogs**

Twenty-four elements in a sample from the little-studied type site of Wari (FLMNH/EA 0119), located in the Andean central highlands, are curated at FLMNH, including a tooth (0119-0095).

**Late Intermediate - c. 1100-1500 CE**

**Cultures**

The Late Intermediate period begins with the rise of the Chimu culture on the north coast of Peru. At the site of Pacatanamu large numbers of mounds and ceremonial trash indicate some cultural carry-over of the Moche cultural portmanteau, with human sacrifices, platform mounds, and derivative ceramic iconography still present.

Chimu sites extend in the Jeque, Chicama, Moche, Viru, Santa river valleys, and Chimu armies conquer land as far north as Ecuador. Chan Chan is the Chimu capital, the site core has between 9 and 11 high-walled palaces (*ciudadelas*) that are up to
three times the size of football field; they form mini complexes that have a single entrance, narrow baffled gates, an entry plaza, and burial mounds. The Tschudi and Rivero Palaces are the latest constructions, with wooden statues lining entry halls, and entry courts with benches around walls. These were sites of status, pomp and ceremony. Servant quarters were distinct and separate. There are small, U-shaped buildings on raised platforms (audiencias) with niches in back, perhaps for royal audiences. People, or perhaps petitioners, had to pass through the core of the palace to access high-ranking people. (Goldstein 2008:271) Storage units for amassed goods and luxury items were greatest roofed spaces in the ciudadelas, with step-over entries; these spaces were not for food storage, but strictly for trade goods.

Burial platforms were the largest structures in the palaces, and they were looted thoroughly in the ancient past. Excess is shown by practices such as laying ground-up Spondylus shell on the ground before king in Lambeyeque. Sacrificial victims (mostly women) are found on a massive scale. The central burial cell in the Tschudi Platform for king’s mummy bundle (fardo) was surrounded by smaller cells and mounds; models of these buildings have been found, and verify important details. Like most Andean peoples, the Chimor practiced ancestor veneration. There were also artisan compounds, some attached to palaces; with compact dwellings, they were centers of textile manufacture, gold production, and small-scale metalworking. Chan Chan has been called the “city of kings and craftsmen”; there are between nine and eleven palaces at Chan Chan, and there may have been 9 or 11 rulers according to Spanish colonial record. (Moseley 2001:261-262) Drought, famine and stress affect late Chimor, and Chimu imperial expansion c. 1400 CE creates conflict with the expanding Inca
Empire. The Chimu resist Inca expansion, and eventually succumb. The Inca react to drought in the highlands by increasing focus on pastoralism, high altitude farming, massive terracing projects and movement to east slope of Andes. There is increased movement of people and products due to Inca population resettlements, and larger numbers of storage facilities.

**Arts and technology**

Luxury goods among the Chimu also include artifacts made of *Spondylus* shell, feathered and fine woven textiles, gold, beakers, inlay work, pins, tumi knives, and funerary masks. Chan Chan’s palaces had painted friezes depicting marine life including fish, birds, and boats made of adobe that were not for public viewing, but the enjoyment of the elite. Chan Chan is a city shaped by drought; water availability affected the expansion and contraction of urban core; at the end, canals bring water directly to *ciudadelas*. A 70 km canal is dug by hand from the Chicama River; there are aqueducts and a massive inter-valley canal that is eventually abandoned, and huge pit wells, but a lowering water table eventually makes them impractical.

**Late Intermediate dogs**

Peruvian archaeologist Lucia Balbuena discovered over 100 mummified dog remains at the coastal site of Cerro Montero 150 km. north of Lima in 2007, and told of more dogs recently excavated at Chilca. (personal communication) Also at Chilca (1000-1400 CE), a number of newborn and juvenile dogs are represented, including at least one mummified newborn (FLMNH/EA 0126-0384), and evidence of an adult dog is also present (FLMNH/EA 0126-0342). Archaeologist Elizabeth Wing observed that “(t)he dog remains are, with the exception of one tooth, the remains of puppies under eight months of age” (FLMNH accession files 121/165). Two of these are mummified
newborn puppies. This would argue against their use as food. The adults “may have been buried elsewhere on the site” (FLMNH/EA accession files 121/165). Sacrifices of puppies are a global phenomenon. (see Pluskowski 2012; Lewis 2001)

**Late Horizon/Inca Period**

Cultures of the coast, who subsisted on the resources of the sea and farming, tended to worship the tide-controlling moon over the sun. According to Schwartz (1991:117), “moon worship was more important on the coast than in the highlands, and the dog’s status was higher there too”. The high frequency of dog iconography and artifacts discussed above could reflect these beliefs. In the highland adapted land of Tahuantinsuyu, the Inca also believed that dogs related to lunar deities, and the lunar eclipse was greeted with the beating of dogs, for fear that the moon was sick and would fall on the earth. (Schwartz 1997:116-117) Dogs were tied up and beaten “to make them bark and bay at the moon, for, they said, at one time, dogs had rendered great service to the Moon, and ever since then it had special affection for them.” (Garcilaso de la Vega 1966:118) Apparently, the Inca believed that the moon would recover from eclipse to rescue its faithful servants. Dogs did not appear in the otherworld of the Inca, but “the howling of a dog foretold the death of a relative.” (Schwartz 1991:119; Rowe 1946) Although Schwartz (1997:56) reproduced a print by Guaman Poma de Ayala that depicts a short-legged dog following a “young Inca girl and her llamas”, working dogs are rarely mentioned in contact documents (Figure 4-1). Some believe that “the Inca kept dogs only as pets and allowed them as village scavengers, but did not use them to hunt or for sacrificial offerings.” (Rowe 1946:219)

Dog remains were found in seven of the Inca burial caves near Machu Picchu; the “principal grave” of a woman had pots, bronzes, textiles, and a small dog in it,
discussed below. (Schwartz 1991:121) Unfortunately, no royal burials were left at Cuzco by the invading Spaniards, and the mallqui and their property were removed to Lima for Christian burial. A right mandible from Huánuco Pampa curated at FLMNH (0566-1085), is from the Inca period. At Chiribaya Alta domestic terraces, cemeteries, and a moat surrounds the site on a hillside over valley; the structures are simple cane construction with enclosures. A large sample of very well preserved dogs from Chiribaya Alta were found near Ilo in 2006, and will be discussed in detail below.

Nineteen *C. familiaris* elements from Torata Alta are curated at FLMNH/EA; a left ulna (FLMNH/EA 0468-0000) from the contact period. Torata Alta displays a gridded site plan characteristic of Inka and Spanish colonial settlement planning, and it is now evident that the site's brief history represents both occupations. (Rice 2012)

**Andean dogs and the conquest of Peru**

The invasion of the Inca Empire by Spanish conquerors led to a collapse of long standing husbandry practices with camelids (Wheeler 2012) and surely would have affected dogs as well Not all native breeds were swamped by the introduction of European breeds of dogs, as mentioned above (van Asch et al. 2013); the viringo and the Chiribaya dogs show little to no genetic influence from introduced dogs.
Figure 4-1. de Ayala’s print of an Inca herder and dog.
Figure 4-2. Guaman de Poma on his way to Lima with dogs.
CHAPTER 5
CASE STUDIES ON ARCHAEOLOGICAL DOGS FROM THE ANDES

In this chapter I discuss several case studies on dogs from different contexts and locations to use as examples of dogs as status symbols and important members of the ancient societies of the central Andes with a diverse array of functions.

Methods

My methods include the review of all available literature regarding dogs, including scientific and popular reading literature, ethnographic accounts, and excavation records. A call for any archaeologists interested in or working with archaeological dogs in the Andes was released, but many of these could not be investigated in person as laws regarding access to archaeological remains and their export for study has become much more restrictive in recent years. The call did, however, produce some results as to the location and number of dogs that have as yet to be quantified in one archaeological record or database. When possible, I used the craniometric methods of Morey (1992) to define morphologies. I made use of the extensive South American collections at the FLMNH to examine temporal and geographic variability to the extent possible. Lastly, I used the knowledge of colleagues to examine carbon dating, isotopic testing, and begin a process of aDNA sampling through Oxford University to place the dogs of ancient Peru on a global stage.

Moche

Dogs are depicted in hunting scenes on some Moche fine-line pots. According to Schwartz, the Moche “used dogs to drive deer into nets” based on depictions of elites on fine-line painted vessels. (1997:46) The participants in these hunts are attired in the ritual garments of the Presentation Theme (Figures 5-1 and 5-2). However, these may
not be hunting dogs as we know them in western culture. In Figure 5-2, it is clear that there are human figures driving the deer toward the richly dressed individuals as well as holding the nets. The scene is reminiscent of game “drives”, where beaters go out into the country in large numbers making noise to drive game toward elite shooters, who simply wait for the game to pass before them in order to kill them. The dogs would have perhaps waited as well, slowing and holding the game for their masters.

Dogs are often depicted in Moche mortuary scenes as well, and were in fact a part of elite burials. Fine-line vases also often depict a black-and-white spotted dog at the feet of a deity referred to as the “Warrior Priest”, who also has snakes emerging from his belt and canid in his head dress. This iconography relates closely to the reality of Burial 2 at Sipan. (Schwartz 1997:119) Work by Donnan (1988) and Goepfert (2012), among others, has explored the relationship between dogs and deities in Moche art. The warrior priest, primary figure at sacrifice ceremonies, is “normally accompanied by a spotted dog.” (Donnan 1988:2) In one case, the Warrior Priest receives a goblet filled with the blood of sacrificial victims, and next to him is the small spotted dog. The association between dogs and humans in art helps to verify other practices shown on pottery from the Moche, such as human sacrifice. Goepfert (2012:104) states that “Moche iconography shows that animals served a variety of ritual purposes, for example, as mortuary food and as guides for the souls of the dead in the afterlife”; this is evidence of the canine as psychopomp in Andean society.

Both the Nazca and Moche had complex iconography with mythical beings as well as naturalistic animals and plants; their art “produced unadorned dogs but imbued wild canids with mythical powers.” (Schwartz 1997:151) Dogs are seen accompanying
humans in their natural form, but foxes are linked with humans in anthropomorphic forms. In one Nazca ceramic piece, a man has a fox skin on his head and wears a mask with the eyes, whiskers, and tongue of a fox. (Schwartz 1997:153) A similar dichotomy between domestic and wild canids is observed in Moche ceramic iconography. A dog is a fox that certain people can control.

Sanchez, Tham, and Perez (2009:20) examined dog morphology from the Moche period using earlier studies, iconographic representations, sculptures and osteology, highlighting two “nuclear morphotypes”, the hairless Peruvian dog and the Chiribaya Shepherd. The evidence for the hairless variety is almost strictly iconographic; the presence of the Chiribaya dog in Moche times and on Moche sites is inconclusive. Regardless of breed, the presence of dogs among the Moche is indisputable. Goepfert (2012:110) has provided new perspectives on animal use among the Mochica, and states that “dogs are the second most common mammals, identified in 15 [Moche] tombs”. Eight of the 15 tombs examined contained dog skull and mandible elements; dog remains in domestic contexts suggests the Mochica may have eaten dogs on occasion. Goepfert suggests it is “likely that pragmatism led them to bury only the most representative parts of the animal and consume the rest of the body.” (2012:110) Complete dog burials are documented in only three funerary contexts: Tombs 1 and 2 at Sipan, and Tomb 8 in Platform 1 of the Huaca del Sol; “dogs were an integral part of the funerary offerings for...two high Mochica lords, and may represent pets killed to follow the dead into the afterlife.” (Goepfert 2012:110) The Mochica elite believed the dog was a psychopomp, a guide to the next world and part of the necessary equipment for a journey to the afterlife.
Rio Muerto

This case study examines the place of the dog in the ancient Andean society of Tiwanaku. The mummified remains of a small dog were recovered from a domestic context at the Rio Muerto site, located in the Osmore River drainage of far southern Peru. Offerings of young camelids and dogs have been found buried beneath floors and entryways of houses at Rio Muerto M43 and at other Tiwanaku sites in the Moquegua colony. The isotopic study of the individual presented here examines strontium signatures and carbon values to glean information relating to possible place of origin and dietary practices to further the hypothesis that dogs in ancient Peru conferred social rank and status on their owners.

The dog mummy was excavated by the MAS project (Moquegua Archaeological Survey) in test excavations at the Early Intermediate/Middle Horizon site Rio Muerto Tiwanaku site complex in September, 1998 directed by Goldstein (see Goldstein 2005). Rio Muerto is a large residential complex affiliated with the colonization of the Moquegua valley by the Tiwanaku culture of the Middle Horizon (AD 500-1000). The Rio Muerto complex includes 5 domestic habitation areas and four identified cemeteries.

Domestic sector M43F of the Rio Muerto complex was characterized by particularly deep, dense and well-preserved stratified midden and floor deposits associated with the “Chen Chen Style” Tiwanaku occupation of Moquegua. Due to heavy sand cover, none of M43F’s town plan or domestic architecture is detectable from the surface, however the 1998 soundings and subsequent household archaeology in 2006 and 2007 indicate typical Chen Chen style domestic construction of quincha (cane wattle and daub walls) with roofs supported by thick wooden posts. Chen Chen style
residential compounds generally consisted of a core of roofed rooms and adjacent unroofed space with several characteristic feature types. (Boswell 2008; Boswell and Goldstein 2009, Goldstein 2005) Occupation layers in test units 1 and 3 have yielded calibrated 1 sigma radiocarbon date ranges of cal AD 886-983 and cal AD 901-916, 967-1020 respectively. (Goldstein and Magilligan 2011:161)

The dog burial, M43F Feature 13 was excavated in test unit 2. Test unit 2, located towards the northwest border of the M43F domestic area, was a 2x2m sounding that produced well-stratified layers of dense Tiwanaku domestic debris, but no structural wall or floor features, suggesting that Feature 13 was associated with a domestic compound, but likely located in exterior unroofed space. This feature was detected at the base of level 4 in area A, a circular soil feature in the northwest corner of the unit.

Excavation found Feature 13 to be a bell-shaped pit 43 cm in diameter at the rim, 46 cm in depth and approximately 60 cm in diameter at the base. The upper layers of the pit fill were Tiwanaku midden material, including 69 Tiwanaku plainware ceramic sherds, fragmentary animal bone and shell, botanical materials, coprolites, feathers, hair, textile fragments, charcoal and lithics, in a dark grey organic silt matrix (Goldstein, personal communication). The dog burial was located at the base of the pit, lying on a bed of woven vegetable mat material (junco). The dog’s body was oriented northeast - southwest, with the snout to the northwest. Goldstein believes that the bell-shaped pit was expressly made to bury the dog. Given the preparation it took and the careful placement of the dog and mat directly on the pit floor, we believe this indicates the careful intentional burial of a companion animal. Less certain is the timing and intent of
the upper fill of the pit, which may pertain to the immediate backfill of the burial or to subsequent infilling of a void space. (Goldstein, personal communication)

Cranial measurements taken on accessible elements of crania based on Morey and Wiant. (1992: 228) Maximum cranial width (MCW) = 45.0 mm, lateral facial width (OI) = 46.6 mm, condylobasal length (CL) = 100.6 mm; tooth row length (IM2) = 64.2 mm. The dog, upon maturity, would have weighed about thirty pounds (13.6 kg), had a mesacephalic shaped snout, and a brown and white coat of midlength hair similar to today’s spaniels.

Tiwanaku people were relocating from altiplano to lower elevation, moving into frontier shared with the Wari between A.D. 100 and A.D. 600. In the Osmore, these people established settlements at Chen Chen, Omo, and at Rio Muerto. Rio Muerto is a large residential complex affiliated with the colonization; the site contains 5 domestic habitation areas and four identified cemeteries. It is at first appearance barren land, but the site is located near a spring and the main drainage of the Moquegua River. The dog burial was excavated in a feature that was likely associated one of the domestic compounds of cane and wattle, in an exterior unroofed space. The dog was buried soon after death, as evidenced by the presence of bug pupae; the burial was then covered with debris from a Tiwanaku midden. The excavator of the site, Paul Goldstein, stated that “we believe that the preparation and careful placement indicates the careful burial of a companion animal”. “Pepe”, as he has been named, was found still intact at the Museo Contisuyo in Moquegua; he appears to have been buried in sleeping position, no signs of violence as would be left on a sacrificed animal. His brown and white fur was preserved in the arid burial, and help to identify him as a domestic dog. The presence of
an unfused distal tibia indicates that the dog was younger than 14 months of age, as this element achieves closure at 14-15 months (Sumner-Smith 1966). In addition, the eruption of permanent teeth is beginning (Figure 5-6), which occurs at 3-7 months (Silver 1963), so it is safe to say that the dog is between 6 months and 1 year old. Based on his size at this age, at adulthood the dog may have weighed ~30 lbs. (13.6 kg). The organic matting, organic material and twine show the care with which he was interred (Figure 5-7). Isotopic samples further inform us of the particular history of this individual. The isotopic signatures indicate that the dog, and perhaps the mother as well, were fed a diet heavy in seafood, even though they lived many kilometers from the sea. The human owners of this animal must have had some connection to the coast, whether through trade or familial relationships.

Function is an important factor when considering the place of the dog in society. So what was the place of the dog found at Rio Muerto, carefully buried in the patio of a home? Dogs are expensive. Because they eat much the same diet as humans, their presence suggests a society with sufficient or even excess food supplies, if not for all members of society, at least for some. Dog burials are frequently found in Peru, but as a percentage of total domestic animal remains, their numbers are few; not everyone owned a dog. Their burials in general are most often associated with high-status humans and their rich grave goods, not with common folk. There has also been an archaeological bias in the more glamorous excavation of high status individuals.

Burials of higher status individuals were found at the cemetery adjacent to the Rio Muerto village. Dogs are most often depicted in association with richly garbed individuals who may represent gods, leaders, or leaders masquerading as gods, both in
formal ritual events and what appear to be ritual hunts. Regardless of these facts, the dog burial from Rio Muerto shows that the animal was buried with care, and if not a widely recognized symbol of status, was at least an important companion, and perhaps, sadly, a sacrifice.

**Omo Dog**

The sample dog from another Early Intermediate/Middle Horizon site, at Omo, south of Moquegua, was excavated by Paul Goldstein in 1987 and is curated at the Museo Contisuyo. It was included in general faunal samples. The individual is very young, but the skeletal remains are complete, with no fused elements observed, some deciduous teeth present, and some fur/hair is present. Unerupted permanent teeth are also present. The context/preservation are not as good as the Rio Muerto specimen; no elements were articulated. This small individual is significant as it may be another example of a sacrificial offering utilizing immature canines.

**The Curious Case of the Hairless Dog: The Viringo**

A 2013 study established the pre-Columbian status of the Peruvian hairless and other indigenous breeds of the Americas extant today, and shows a genetic relationship between the Peruvian Hairless and the Mexican Hairless Dog, or Xoloitzcuintli. (van Asch et al. 2013) The hairless dog of Peru, today known as the viringo or “Peruvian Orchid Dog” (Figure 5-9), appears in the archaeological record during the Initial Period. Luckily for faunal analysts, there is a mandibular deformation that accompanies the hairless mutation, allowing us to identify this specific breed from skeletal remains if the tooth rows are present. (Sanchez et al. 2012) Hairless dogs were acquired by trade with western Mexico, perhaps through Equadorian intermediaries. They probably arrived in Peru after 500 B.C., as they are portrayed “at first rarely among the Moche and then
commonly among the potters of Chimu, Chancay, and Lambayeque.” (Schwartz 1997:133; van Asch et al. 2013) Today, in both Mexico and Peru the viringo is used in healing. In interviews with the Peruvian curandero Edwardo Calderón, Marion Schwartz (1997:155) found that dogs on the north coast are valued because of their swiftness and their ability to track lost items and people, as well as their ability to “see spirits”; the Peruvian hairless especially is believed to have supernatural abilities. The association with dogs and supernatural powers is not unusual; the heightened sensitivity of dogs to scent and their ability to understand human speech was as impressive in ancient times as it is today. In fact, the Viringo is still such a clear example of Peruvian identity that the Peruvian government, upon hearing that the new president’s young girls were allergic to dogs with hair, offered one to the Obamas due to the children’s allergies; the offer was politely declined. (Wade 2008)

**Pachacamac**

Pachacamac occupies a liminal space, situated between the Andes mountain range and the Pacific Ocean. Earth, sky, and sea all blend at the June equinox, an environment dominated by gray, the beginning of the austral winter. For most of the season, the sun and moon are covered by fog and clouds. In ancient times, it was the major oracle site for all the peoples of the Andes, a site of worship and of trade.

The huge Early Intermediate/Middle Horizon complex at Pachacamac included a central market where pilgrims from all of Tihuantisuyo gathered for extended periods. As the sacrificed dogs exhibit characteristics of at least four different morphotypes or breeds, it may be that dogs were a component of regional costume traditions. If the dogs were brought to the site from far-reaching regions, this is a possibility. There appears to be no evidence of resident priests breeding dogs for sacrifice, as seen in
ancient Egypt. The Cemetery of Sacrificed Women had at least two mummified dogs. (Tibali 2010:196) The dogs may have been sacrificed as psychopomps, as guides for sacrificed virgins of the sun; these young women were also gathered from all regions of the empire; it may be possible that these dogs were companions in life as well as death. The strictly female compounds may also lend credence to the special connection between dogs and women, as these very young women had left their families and homelands, and would have treasured the company of dogs.

**Chiribaya Alta**

Archaeological investigations carried out at sites of the Southern Peruvian coast, specifically at Ilo, have allowed us to identify almost complete and well-preserved remains of 43 dogs nearby their also mummified masters, at sites of the Late Intermediate Chiribaya culture (900-1350 years CE). The “pastor Chiribaya” has an intermediate nose, hare-like limbs, long hair usually of beige color, spiky tail, with ears not being prick or lazy/floppy but similar to the ones of a small Golden Retriever.” (Sanchez et al 2009:25; Meir, 2006) The excellent preservation status of the mummified remains (see Figure 5-10) has allowed us to observe physical characteristics, like the limbs or the hair color, and to compare them to establish identities with the current dogs living on the Ilo surroundings, who may be genetic descendants of the mummified dogs, as suggested by Meier. (2002)

Genetically, “ancient DNA (aDNA) analyses, carried out by Leonard et al, (2002) on pre-Hispanic dogs from the United States of America, Mexico, Peru and Bolivia, indicate that one of the Chiribaya specimens conforms a new haplotype generated by geographical isolation, being other specimen a common haplotype, sharing a clade with Bolivia and Mexico specimens. These molecular data represent an interesting
foundation to consider the Chiribaya dog as a new pre-Hispanic breed.” (Sanchez et al. 2009: 22)

The studies by Meir (2006) and van Asch et al. (2013) suggest that these dogs were used to handle camelid flocks and that their masters believed in dog life after death, much as in the ancient Egypt. “We have found that in all the cemeteries, always, in between the human tombs there are others dedicated to the dogs, full-grown and puppies…They have their own grave, and in some cases they are buried with blankets and food”; the discovery speaks volumes about the high status the Chiribaya culture placed on the dogs, which Guillen says were prized for their skill in herding llamas. (de Pastino 2006) The naming “pastor Chiribaya” has been chosen for the potential new Peruvian dog by the Centro Mallqui archaeologists – Sonia Guillen, in charge of Ilo excavations, as well as the Peruvian Kennel Club specialists. (www.kcp.com.pe)

The necessity of herding dogs in association with native camelids is questionable, and there is little ethnographic evidence of this practice, despite some written accounts. (Schwartz 1997:56; Kuznar 1990; Guaman Poma de Ayala 1936) Cultural materialists seek to explain the presence of domestic animals and their uses by their practical uses in society. (Harris 1974,1981:15) In the case of herding large numbers of camelids, dogs are not a necessity. Llamas and alpacas will naturally seek their corrals in the evening; children armed with slings could easily guard the herds by day. To move a group of camelids only requires two people and a rope; llamas and alpacas will not jump over an obstacle, so the herders need only hold each end of a long rope and approach the herd to move them at a leisurely and controlled rate. While domestic dogs are more than capable of herding, they are not needed in the Andes. It is
possible that the dogs were sent out with the camelids to accompany or protect the children who were watching over flocks from danger, as the Andes once held a reasonably large population of mountain lions and cats, foxes, and other humans. (de Ayala 1980; Johnson et al. 1998; Bank et al. 2002) Dogs can also be used to help protect newborn camelids from predatory animals and birds. The Chiribaya dogs were buried with great care, and in large numbers, some with fine weavings. Again, as with the examples above, this may simply indicate the status of their human owners, rich enough to feed a reasonably large dog.

**Andahuaylas/Sonhuayo**

In the Andes, the zorro is sometimes referred to as *perro de los machulas*, or dog of the ancestor spirits, and was considered the younger brother of the puma. (Urton 1981) Small foxes may have performed the same role as the coyote in North American belief systems, as the thief and trickster. These roles were quite distinct from those played by domestic dogs. In Andean communities, a fox’s howling predicts the success or failure of the growing season. If howling is heard in October and November, plenty of rain and a good harvest will follow; it was bad luck for a fox to howl in March. In Inca times, the *Atoq*, or “fox”, was one of the dark cloud constellations that were used to determine seasons and agricultural activities. (Urton 1981) Foxes and dogs have a long history of interactions with humans, serving diverse roles from food source to pet companions to deities. This Late Horizon case history from the Andean highlands examines ethnographic and historical stories about canids in the Andes and combines this information with morphometric and isotopic analysis of two canids from Sonhuayo, a Chanka site near modern Andahuaylas, Peru to investigate their diverse cultural roles. These canids had local strontium signatures and high carbon isotope values, indicating
that they lived locally and consumed huge amounts of C₄ plants such as maize. Their location in a looted burial cave containing human bodies also indicates that their value to the society. (see Miller 2003:17)

Post-cranial elements were absent in the burial, so cranial morphometrics were used to help in species identification. (Morey 1992; Morey and Wiant 1992; Walker et al. 2005) Cranial metrics support a classification as dogs (Canis lupus familiaris), as does the burial context (Table 5-1).

Just as in humans, mammalian tooth enamel does not remodel during life, so enamel δ¹³C values reflect diet during the time of enamel mineralization for that tooth. As with humans, appropriate offsets must be added to faunal tooth enamel δ¹³C values in order to interpret them properly. Tooth enamel apatite offset values range between 8‰ to 10‰ for carnivores, with an average of 9.5‰, while offset values for herbivores range from 12‰ to 14‰, with an average of 13.5‰. (Kellner and Schoeninger 2007; Lee-Thorp et al. 1989; Krueger and Sullivan 1984) An offset of 9.5‰ was added to both Sonhuayo canids. Methods are detailed in Lofaro (2012) and Kurin, Lofaro, Gomez and Krigbaum (2014). Strontium isotopic analysis can determine the mobility and locality of individuals and animals in relationship to the landscape in which they lived. The Sonhuayo canids fall within the local range.

The young adult human (20-35 years old) buried with the canids in SON.04 has a δ¹³C value of -3.63‰ and an ⁸⁷Sr /⁸⁶Sr value of 0.707467. The average ⁸⁷Sr /⁸⁶Sr value (n=14) for human burials less outliers for the area is 0.707335. The average human burial δ¹³C value (N=14) is -4.93‰, ranging from -1.55‰ to -8.47‰. Methods are detailed in Lofaro (2012) and Kurin, Lofaro, Gomez and Krigbaum (2014).
The high $^{13}$C values and evidence of multiple dental caries suggest a diet heavy in carbohydrates such as maize for these canids; they likely were domestic animals living with and being fed by humans; combined with cranial morphometrics, there is little doubt that they were in fact domestic dogs. This particular burial cave was looted prior to analysis, but much information can still be gleaned from recovered remains.

**Huanca**

The Huanca were a large Late Horizon ethnic group from the Mantaro valley in the central Andean highlands. (Urton 1988:70) Before they were conquered by the Inca, the Huanca "worshipped the image of a dog as their god", and "so relished the flesh of the dog that they would do anything for it"; "they formed their skulls into a sort of horn they played at their festivals and dances." (Garcilaso de la Vega 1966:335) The Inca suppressed the worship of the dog, "since they did not permit the worship of idols of animals." (Garcilaso de la Vega 1966:335) These practices of the Huanca are also mentioned in the Huarochiri Manuscript: “Paria Caca passed sentence on Huallallo: Because he fed on people, let him now eat dogs, and let the Huanca people worship him. When the Huanca worshipped him, they’d propitiate him with dogs. And since he, their god, fed on dogs, they also ate them. As a matter of fact, we speak of them as ‘dog-eating Huanca’ to this day." (Urton 1988:70)

As illustrated above, the idea that a population is descended from dogs lends the animals special status within that society; the Cherokee and other Iroquoian people worshipped the dog, sacrificed dogs, and gave the dog a special place at funerals because of their superhuman senses, and placed the dog within the framework of their religion and mythology. There is little reason to think the Huanca lent the dog lesser status in their own society. Because of this special status, dogs may have been buried
in special circumstances, perhaps with humans but also possibly far from settlements, complicating their location and analysis using archaeological methods.

**Machu Picchu**

The remains of six dogs were found in tombs at the Late Horizon Inca site of Machu Picchu. George Eaton identified them as *Canis Ingae pecuaris*; his efforts to further define New World dogs with new, more specific Latin taxonomical identifications was never accepted by the scientific community. (Miller 2003:16; Eaton 1916:25,66) Two of the crania were well preserved enough for Wing (1989) to determine that they were long-faced dogs, conforming to Eaton’s description of them as being typical “collie-like Inca dogs.” (Miller 2003:16) On the contrary, I find the cranium and mandible pictured in Miller (2003:17) to be midrange on the cephalic index, with brachycephalic being shortest and dolichocephalic the longest, the dog buried in Grave 26 appears mesatocephalic (Figure 5.8). The human remains have been identified as mostly those of women, and a “pattern of dogs being buried with female humans is evident from the data.” (Miller 2003:16) These midsized dogs were most probably comfort animals with close relationships with their female owners. The confined space of the site also leads me to believe that these dogs served only as companions. “The proliferation of…types of dwarfs (dogs), particularly in towns, may be largely influenced by cultural factors, and in particular the increased importance of pets in comparison with working animals and the spatial constraints of an urban environment.” (Baxter 2006:21) Another factor to be considered is the hormonal/biological relationship between dogs and women discussed above.

None of the canid bones showed evidence of butchering, and four of the six skeletons were reported as complete; “the dogs were deposited in the tombs as intact
animals, presumably as offerings of special significance." (Miller 2003:16) Grave 26 contains a dog and an “elderly (45-55 years old) and splendidly appointed woman, who Eaton and Bingham believed to be the High Priestess of the Machu Picchu Acclahuasi.” (Miller 2003:17; Bingham 1930:110; Eaton 1916:24) More recent analysis may not support this specific attribution, but the location of the burial, the high quality of associated goods, and the inclusion of “a complete dog certainly suggest that the woman was a person of considerable importance within the Machu Picchu hierarchy”, and the tomb is still referred to as the Tomb of the Mamacona. (Miller 2003:17)

Rowe (1943:219) claims that the “Inca kept dogs only as pets and allowed them as village scavengers, but did not use them to hunt or for sacrificial offerings”, and Miller (2003:17) says that “dogs have no reported association with female owners among the Inca”. These claims seem contradictory to the evidence at hand; clearly there is the example here discussed, and both biological and ethnographic evidence that indicates a special relationship between women and dogs.

The case studies discussed show the multivariate functions and forms of domestic dogs in the Andes. From associates to elites and gods at Moche to companions and psychopomps for the women at Machu Picchu, the place of the dog becomes more complex and varied in sync with the developing populations of the Andes.
Table 5-1. Comparative cranial morphology for Andahuaylas dogs.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Abr.</th>
<th>Zorro H25 (MC)</th>
<th>Dog 22 (MC)</th>
<th>SON.04.11 (MA)</th>
<th>SON.04.10 (MA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>condylobasal length</td>
<td>CL</td>
<td>157.7</td>
<td>159.7</td>
<td>170</td>
<td>156.2</td>
</tr>
<tr>
<td>palatal length</td>
<td>PL</td>
<td>93.7</td>
<td>93.1</td>
<td>86.9</td>
<td>85.5</td>
</tr>
<tr>
<td>tooth row ledge</td>
<td>IM2</td>
<td>92.2</td>
<td>97.4</td>
<td>91.9</td>
<td>85.4</td>
</tr>
<tr>
<td>lateral face ledge</td>
<td>OI</td>
<td>76.5</td>
<td>81.1</td>
<td>79.3</td>
<td>70.5</td>
</tr>
<tr>
<td>palate width</td>
<td>PW</td>
<td>34</td>
<td>58.6</td>
<td>62.4</td>
<td>56.4</td>
</tr>
<tr>
<td>maximum cranial vault width</td>
<td>W</td>
<td>49.9</td>
<td>60.2</td>
<td>58.4</td>
<td>54.3</td>
</tr>
<tr>
<td>third premolar length</td>
<td>P3</td>
<td>12.2</td>
<td>12.7</td>
<td>12.4</td>
<td>11.7</td>
</tr>
<tr>
<td>fourth premolar (carnassial) length</td>
<td>P4</td>
<td>17.1</td>
<td>19</td>
<td>20.5</td>
<td>18.6</td>
</tr>
</tbody>
</table>
Figure 5-1. Map showing case study sites. (Susan Duser)
Figure 5-2. Presentation Theme Vessel (Sanchez et al. 2009).

Figure 5-3. Roll-out of image on vessel in Figure 5.2 (Alva and Donnan 1993).
Figure 5-4. Deer hunt with spotted dog (Sanchez et al. 2009).
Figure 5-5. Deer hunt with black and white spotted dog (Archivo Museo Larco).
Figure 5-6. Anthropomorphic dog warriors (Michael Wylde, Museo Larco).
Figure 5-7. Rio Muerto dog mummy (Michael Wylde).
Figure 5-8. Erupting permanent premolar on Rio Muerto dog (Michael Wylde).
Figure 5-9. Organic material and twine ‘wrapping’ Rio Muerto dog (Michael Wylde).
Figure 5-10. Canid cephalic index (Google Images).

Figure 5-11. The viringo, or Peruvian hairless dog (Google Images).
Figure 5-12. One of the Chiribaya dog mummies (Atwood 2007).
CHAPTER 6
DISCUSSION: DOGS IN THE CENTRAL ANDES - SOCIAL CONNECTIONS

The role of the dog in the ancient Andes is complex. In this chapter, I discuss the case studies above and their implications. Dogs were seen as status symbols in some contexts; pets, perhaps guard dogs, exotic possessions, sacrifices, and companions to wealthy women. Keeping in mind that the story of the dog reflects the story of its human companions, I discuss the differing circumstances and possible interpretations of dogs in the archaeological record in the central Andes. I discuss the dog as an artifact, not as a faunal component, as some recent reports continue to do; the dog is a product of human manipulation, not a “natural resource.” (Azua et al. 2013:557) I also examine the diversity of dog breeds and differing morphology as they increase over time. As social systems become more complex, so does the role and variability of the dog.

Dogs are expensive. Because they eat much the same diet as humans, their presence suggests a society with sufficient or even excess food supplies, if not for all members of society, at least for some. In the majority of temporal contexts, dog burials are ubiquitous in Peru, but as a percentage of total domestic animal remains, their numbers infrequent as to faunal remains in general. Of course, as illustrated above, dog remains are not faunal remains; they are artifacts of human culture. Their burials are often associated with high-status humans and their rich grave goods, not with common folk. As indicated above, “an important function of the graves...is to indicate the status of the deceased” and “high numbers of dogs in a grave reinforce the argument that an important function of the animals was to demonstrate status or prestige”; the authors conclude that “the dog burials were grave gifts...to mark the prestige, importance, and wealth of the deceased.” (Prummel 1992:151,157; Bennett 1989) Dogs are often
depicted in association with richly garbed individuals who may represent gods, leaders, or leaders masquerading as gods, both in formal ritual events and what appear to be ritual hunts. Considering this evidence, the dog had a special position in Peruvian society; in some cases a symbol of elite status and luxury, a mode of communication and control of both the natural world and culture, an ancestor, and a companion in the afterlife.

The lack of very early specimens may be a bias of time, with the oldest samples being from sparser populations, often predating the dense concentrations of faunal material from large urban sites, and a simple lack of sites available to study. Also, much of earliest archaeological exploration focused on empires of palaces and pyramids, less so on simple and ephemeral landscapes.

The dogs at Moche, particularly the small black and white spotted dogs discussed above, were a physical representation of a connection with a particular deity, and as such served to help identify human rulers also associated with godhood. Their inclusion in only specific contexts in art and inhumation clearly shows that these dogs were symbols of divine connection and power. Their inclusion in other contexts shows their connection to warriors and military symbolism, human male sacrificial captives, and participants in royal hunts, all easily recognized as activities of the elite or even the gods themselves.

The small dog buried in a house patio at Rio Muerto is not perhaps so easy to define. It was buried with great care, as evidenced by the bell-shaped pit dug for the purpose; it was wrapped, but not in any textile of great value, rather in natural plant matting and twine. It was younger than one year old. This individual may have been a
new pet that met an unfortunate early demise; it was found that he consumed large amounts of food from the coast, even though living many kilometers inland. Perhaps the family that owned the house was very well connected through trade. Another possibility is that the small dog was a sacrificial offering, buried in the house as a protecting spirit. The presence of bug pupae suggests the animal was not immediately buried, but was exposed for a time after death. The context of this burial does not allow us to differentiate whether it was the burial of a family pet or a sacrifice to the gods. The remains of a newborn puppy found at Omo has little to allow specific analysis. All the elements were present and unfused, indicating that the dog was only a few weeks old. Located in midden material, it may be the disposal of a deceased small pet in a casual way; in many cultures very small animals, and indeed newborn or premature children, were not given formal burials.

The case of the viringo illustrates many of the claims stated above; not suited for the extreme climates of the Andes, it required special care, which confers special status. It is an exotic looking creature, beyond common or wandering village dogs, and could not survive without human intervention. Yet it was intentionally bred for hundreds of years. The dogs may have had a place in traditional medicine, as they do now. They could at the least serve as bedwarmers on cold Andean nights, and perhaps warn of intruders, but could not have suited any purpose such as hunting or herding. These dogs were and are today a symbol of status and national/ethnic pride.

At Pachacamac, hundreds of dogs may have been sacrificed along with the Virgins of the Sun. Their conferred status as sacrificial offerings is apparent. No evidence is as yet found to indicate that dogs were bred on site for sacrifice, as they
may have been in ancient Egypt; however, the presence of at least four breeds (or morphotypes) may indicate dogs brought from the far reaches of the Andes with their human owners as sacrifices (Figure 6-1). The liminal space at Pachacamac, between sea and land, earth and sky, was significant. The long standing tradition of regional costume and identity may have been reflected in these canine psychopomps; sent as guides in the next world for their young human sacrifices, they would have represented a specific homeland and tradition.

The large sample of mummified dogs from Chiribaya Alta represents a practice of canine interment over time by the people of the coastal valley. The dogs are buried with or between people who seem to be individuals of some rank, and the dogs are buried with great care and with grave goods of their own. Although the supposition that these dogs were in fact shepherds is problematic, and there seems little proof of this practice, it is safe to say that the dogs were highly valued, respected in life and death, and served as psychopomps for their human counterparts.

The two canid crania from Andahuaylas, from a disturbed human grave, still provided some information of value; they were dogs, based on cranial morphology, and not foxes, as supposed. They also showed a distinctive diet of high sugar human foods (corn) that they consumed in quantities sufficient to produce cavities. The dogs lived closely with their human owner, and were interred with them upon death, both factors that show a favored status. This case study also shows the usefulness of canid remains even after a site has been partially destroyed.

The Huanca from the Andean highlands offer an example of an ethnic group who revere the dog as an actual physical ancestor and consume their flesh in ritual, as we
have seen among some of the Plains Indians of North America. The Huanca were differentiated from the expanding Inca Empire by these beliefs. As seen in several other cultures, the reverence of an animal ancestor or totem exalts the creature to a status far beyond common food or work. North American tribes who believed that they were descended from dogs took particular care in their interment, removing the dog's body to a remote location from the human settlement. (see Cummins 2002) The fact that the dog was revered as an ancestor and parts of dogs were used in ritual and warfare clearly indicate the special status of the dog in Huanca society.

In the last case study, high status humans are buried with companion animals at Machu Picchu. The women buried there had dogs; the site itself negates the need for hunters, herders, or even guard dogs. All other researchers have observed that the women, especially the woman buried in Grave 26, were of notable status, buried with rich grave goods, and were accompanied by dogs in at least six instances. Although some have stated that dogs were not highly valued by the Inca, they were important to the women at Machu Picchu, a part of their high-status lifestyle. The association between human female hormonal response and dogs is important here; groups of women held at the remote fortress, and virgins, perhaps not given the opportunity to reproduce, probably treasured their canine “children”.

As an additional part of my study, I have submitted samples to an international study on dog domestication at Oxford run by Dr. Greger Larson (Table 6.1). A large number of ancient Peruvian dog remains are housed in the FLMNH/EA, and would be suitable for aDNA samples to be used as an addendum to my dissertation project. Having received an invitation to participate in the study, at little or no cost, by the Oxford
Museum of Natural History, I set about locating suitable elements. These samples would provide detailed information applicable to my dissertation topic as well as providing advanced analytical resources on our collections at FLMNH, which would further add to our increasing database resources, as well as contribute to the larger study of dog development in a worldwide context (see Appendix I).

My initial goal for this study was to investigate the place of the dog as a symbol of status in ancient Peru; this hypothesis was largely based on a paper I wrote describing the dogs depicted in Moche art and buried in spectacular Moche tombs. These particular dogs were status symbols, depicted as the companions of gods and conferring this status on human rulers. However, the diversity of environments and cultures of pre-Columbian Peru are far too widely placed socially and geographically to generalize. The term status itself is problematic; while the image of the dog in Moche appears to be closely related to status, it is a social status recognized by a large part of the population. The small dog buried at Rio Muerto, and those buried with women at Machu Picchu also had status, what I would call familial status. Although perhaps not displayed in ritual or depicted in high status art, they were valued members of human families, as indicated with the care with which they were buried and the context of their interment. The same applies to the dogs at Chiribaya Alta; while there is debate as to function, they also were buried in status burials, often with rich textiles. They were valued.

All of the above case studies (except the ongoing aDNA work) clearly illustrate that dogs are to be considered as artifacts, produced by and imbued with meaning as material culture, not fauna. The dog occupies a dichotomous role in most societies, and
the ancient Andes are no exception. The role of dogs through time and space in the Andes shifts in meaning, but is always multivariate in the human societies it inhabits. It does appear that the diversity of dog breeds and differing morphology increases over time in the Andes, as do social systems; from earliest generalist type dogs to the diversity of size and conformation found at pre-contact Pachacamac, dog become increasingly varied, as do social systems. No matter how urbanized and removed from it we become, dogs will always be our link to nature, the bridge between culture and nature, the “wolf in the parlor.” (Franklin 2009)

Figure 6-1. Dog morphotypes on display at Pachacamac (Michael Wylde, Museo Pachacamac).
CHAPTER 7
CONCLUSION

Dog burials are ubiquitous world-wide. If there were no burials in Peru, it would be a global anomaly, but this is not the case. All the periods of human history in the Andes involve dogs (with the exception, so far, of one). The black and white dogs at Moche were associated with deities and royalty, conferring status on their owners and connecting them to the gods. The dog buried in a domestic plaza may have been an offering, but was most likely a family pet; the dog at Omo is more problematic. It may have been part of a litter that did not survive, and was simply discarded, as it had not yet attained a place in the lives of its human owners. The Peruvian Hairless still survives today, an exotic symbol now associated with Peruvian identity; it served the same function in the past. The many dogs interred at Pachacamac were offerings to the gods, accompanying human sacrifices as psychopomps; they may also represent the costumbre of diverse peoples of the central Andes, symbols of human identity. The dogs at Chiribaya Alta may not have been shepherds in the border collie sense, but were perhaps companions for human shepherds minding flocks of camelids; they were, never the less, valued by the coastal folk of the Osmore, as indicated by their careful burial with grave goods and people. The two dog crania from Andahuaylas/Sonhuayo, although they are from a disturbed human burial, still give us information on the person buried in the highlands. The Huanca ethnography shows that dogs were revered as ancestors among at least one group of people in the central Andes, a marker of identification and difference in the face of Inca invaders. Lastly, the dogs buried with women show the close biological connection that makes a companion dog so very important, especially under stressful conditions, and the place of dogs as accoutrement...
for the wealthy or privileged. The place of the dog in cultures developed over time; from earliest archaic dogs that may have been hunting companions or camp followers, the dog’s status changed as human societies became sedentary and stratified themselves. As the various cultures of the Andean diaspora become more complex, with larger populations, bureaucratic governance, monumental architecture, complicated trade practices, and multivariate social networks, so does the place of the dog become more complex itself, as well as an increasing number of morphologies, or “breeds”.

The earliest excavations and lootings of the rich sites of Peru may have lost many dog burials and remains, discarded as animal bones unsuited for sale or display in museums. There has also, until recent years, been an “excavation bias” to examine only temples and palaces, so there may be much we do not know about the “regular” dogs of Peru. Even though the royal burial at Sipan (Figure 7.1) is truly glorious, and includes a dog as well as other animals, there is little known of the daily life of the dogs not honored thus. The excavation of more domestic sites and the re-examination of mordant museum collections such as the project headed by Greger Larsen will continue to inform and refine our understanding of the place of the dog in the past, in society, and in human families. The dog has lived among us for thousands of years, sharing our lives and peregrinations, living the dichotomy of the dog as a member of society as a non-human person.
Figure 7-1: Lord of Sipan (National Geographic).
Figure 7-2: Ancient dogs of Peru- Moche, Rio Muerto, Omo, Viringo, Pachacamac, and Chiribaya dogs (Clockwise from top left) (Google Images).
APPENDIX A
OXFORD STUDY ON ANCIENT DOG DNA

Greger Larsen of the Oxford Museum of Natural History in England began a 3-year NERC funded grant in 2013 entitled *Deciphering Dog Domestication through a Combined Ancient DNA and Geometric Morphometric Approach*. In addition, Larsen has won a 5-year starting investigator ERC grant entitled *Unifying Domestication and Evolution using ancient DNA* that began in 2014 and finishes in 2019. Larsen’s current research will be focused on the dogs of the New World, hence my opportunity to provide samples from FLMNH/EA. He describes his project as follows:

Dog domestication remains an enigma, and establishing the origins of dogs is critical given their standing as the first domesticate. Knowing how, when, and where dog domestication took place will provide new insights into the shift from hunting and gathering to farming, one of the most significant steps in human history. We will combine ancient DNA (aDNA) and geometric morphometric (GMM) techniques to archaeological canid remains. The primary aim of this proposal is therefore to directly address where, when, and how many times dogs were domesticated. In order to do so, we will characterise and track fine-scale genetic and morphometric variation in wolves and dogs through space and time including samples from the Pleistocene through to modern museum collections. (www.arch.ox.ac.uk/palaeobarn.html; Larsen et al. 2012)

Dog remains from archaeological contexts in Peru are not uncommon. However, exporting samples for genetic studies from Peru is becoming increasingly complicated due to changes in government policy regarding the export of these materials for analysis abroad. The FLMNH/EA collections retain large samples from archaeological sites in Peru containing archaeological dog remains that I have been determined to have viable samples for genetic analysis.

Upon receiving permission to proceed, I selected specimens following protocol established by Greger Larsen. Specimens selected for analysis were reviewed and confirmed by the EA Collection Manager Irv Quitmyer, and thoroughly recorded before
removal and shipment to Larsen at the Oxford Museum of Natural History, Research Laboratory for Archaeology, Dyson Perrins Building, South Parks Road, Oxford, UK.

Larsen will combine ancient DNA (aDNA) and geometric morphometric (GMM) techniques to archaeological canid remains. The aDNA samples will be from bone or tooth roots or, where possible, petrous bones. A maximum ~1g sample will be sufficient to generate DNA and isotope data as well as a 14C date should it make sense to do so. This analysis will aid research into the origins and relationships between the archaeological sample populations provided by FLMNH.

Larsen and the Oxford Museum of Natural History will keep all extractions in dedicated -20C freezers in the PalaeoBARN building on Museum Road, Oxford, preserved for continued research. The results of this study will be provided to the FLMNH/EA as an addition to the museum database, and will be available for future research in perpetuity. The results will also be published in my dissertation and in an international peer-reviewed journal article. Larsen will submit all published sequences to Genbank (http://www.ncbi.nlm.nih.gov/genbank/) and next generation data will be submitted to the short read archive making sure to include all the FLMNH accession numbers. Genbank will also supply all archive codes to the FLMNH along with copies of all related publications.

Table A-1 - aDNA samples submitted to Oxford study on dog domestication.

<table>
<thead>
<tr>
<th>Origin</th>
<th>Site</th>
<th>Acc. No.</th>
<th>Element</th>
<th>notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peru</td>
<td>Chilca</td>
<td>0126-0384</td>
<td>R. humerus</td>
<td>from a &quot;near intact puppy&quot;</td>
</tr>
<tr>
<td>Peru</td>
<td>Chilca</td>
<td>0126-0342</td>
<td>vertebra</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>Pikicallepata</td>
<td>0123-0078</td>
<td>L. radius</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>Rosamachay</td>
<td>0120-0223</td>
<td>L. humerus</td>
<td>part of &quot;intact juvenile burial&quot;</td>
</tr>
<tr>
<td>Peru</td>
<td>Wari</td>
<td>0119-0095</td>
<td>R. maxillary M1</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>Wichiganan</td>
<td>0204-0531</td>
<td>R. humerus</td>
<td>part of &quot;intact juvenile burial&quot;</td>
</tr>
<tr>
<td>Peru</td>
<td>Rio Muerto</td>
<td>M43-1355</td>
<td>R. maxillary M2</td>
<td>part of &quot;intact juvenile burial&quot;</td>
</tr>
<tr>
<td>Peru</td>
<td>Omo</td>
<td>M10-1163</td>
<td>deciduous P2</td>
<td></td>
</tr>
</tbody>
</table>
### Complete List of Samples Discussed

<table>
<thead>
<tr>
<th>Site/location</th>
<th>Temporal Period</th>
<th>curated</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fell's Cave</td>
<td>Lithic Period</td>
<td></td>
<td>skeletal remains</td>
</tr>
<tr>
<td>La Paloma</td>
<td>Lithic Period</td>
<td>FLMNH/EA 0300</td>
<td></td>
</tr>
<tr>
<td>Telarmachay</td>
<td>Lithic Period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pikicallepata</td>
<td>Initial Period</td>
<td>FLMNH/EA 0123</td>
<td></td>
</tr>
<tr>
<td>Wishgana</td>
<td>Initial Period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paloma</td>
<td>Initial Period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracas</td>
<td>Initial Period</td>
<td></td>
<td>intact burials</td>
</tr>
<tr>
<td>Lighthouse Site, Supe Valley</td>
<td>Initial Period</td>
<td></td>
<td>intact burials</td>
</tr>
<tr>
<td>Salinar, Viru Valley</td>
<td>Initial Period</td>
<td></td>
<td>intact burial</td>
</tr>
<tr>
<td>Castillo de Tomaval</td>
<td>Initial Period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tembladera, Jequetepeque</td>
<td>Initial Period</td>
<td></td>
<td>effigy jar</td>
</tr>
<tr>
<td>Rosamachay</td>
<td>Early Horizon</td>
<td>FLMNH/EA 0120</td>
<td>skeletal remains</td>
</tr>
<tr>
<td>Telarmachay</td>
<td>Early Horizon</td>
<td></td>
<td>intact burial</td>
</tr>
<tr>
<td>Moche, Sipan</td>
<td>Early Intermediate</td>
<td></td>
<td>intact burial</td>
</tr>
<tr>
<td>Moche</td>
<td>Early Intermediate</td>
<td>Museo Larco</td>
<td>multiple effigies</td>
</tr>
<tr>
<td>Nazca</td>
<td>Early Intermediate</td>
<td></td>
<td>effigies, geoglyph</td>
</tr>
<tr>
<td>Pachacamac</td>
<td>Early Intermediate</td>
<td></td>
<td>burials, remains</td>
</tr>
<tr>
<td>Wari</td>
<td>Middle Horizon</td>
<td>FLMNH/EA 0119</td>
<td>skeletal remains</td>
</tr>
<tr>
<td>Rio Muerto</td>
<td>Middle Horizon</td>
<td>Museo Contisuyo</td>
<td>burial</td>
</tr>
<tr>
<td>Omo</td>
<td>Middle Horizon</td>
<td>Museo Contisuyo</td>
<td>burial</td>
</tr>
<tr>
<td>Cerro Montero</td>
<td>Late Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chilca</td>
<td>Late Intermediate</td>
<td>FLMNH/EA 0126</td>
<td></td>
</tr>
<tr>
<td>Chiribaya Alta</td>
<td>Late Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machu Picchu</td>
<td>Late Horizon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sonhuayo</td>
<td>Late Horizon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Huanca, Mantaro Valley</td>
<td>Late Horizon</td>
<td></td>
<td>skeletal remains</td>
</tr>
<tr>
<td>Huanca, Mantaro Valley</td>
<td>Late Horizon</td>
<td></td>
<td>ethnography</td>
</tr>
</tbody>
</table>
APPENDIX C  
LAB RESULTS FROM ELLEN LOFARO: SAMPLES FROM THE RIO MUERTO DOG.

### Individual Results

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Individual</th>
<th>$\delta^{13}$C (‰), vs. VPDB</th>
<th>$\delta$D (‰), vs. VSMOW</th>
<th>$\delta^{18}$O (‰), vs. VSMOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog_M10_1</td>
<td>-13.86</td>
<td>-63.41</td>
<td>11.46</td>
<td></td>
</tr>
<tr>
<td>Dog_M10_2</td>
<td>-14.82</td>
<td>failed</td>
<td>failed</td>
<td></td>
</tr>
<tr>
<td>Dog_M43_1</td>
<td>-13.89</td>
<td>-67.88</td>
<td>10.73</td>
<td></td>
</tr>
<tr>
<td>Dog_M43_2</td>
<td>-14.27</td>
<td>-77.46</td>
<td>11.43</td>
<td></td>
</tr>
</tbody>
</table>

In regards to the failed sample, the carbon analysis was run separately from hydrogen and oxygen.

### Bulk results (average of the two samples):

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Individual</th>
<th>$\delta^{13}$C (‰), vs. VPDB</th>
<th>$\delta$D (‰), vs. VSMOW</th>
<th>$\delta^{18}$O (‰), vs. VSMOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog_M10</td>
<td>-14.34</td>
<td>-63.41</td>
<td>11.46</td>
<td></td>
</tr>
<tr>
<td>Dog_M10</td>
<td>-14.08</td>
<td>-72.67</td>
<td>11.08</td>
<td></td>
</tr>
</tbody>
</table>

A Knudson et al 2015 JAS article studied hair results from Paracas (human hair), with an average $\delta^{13}$C of -15.9.

A White et al 2009 JAS article studied hair results from Pacatnamu (north coast Peru, Moche to Lambayeque), also human. Highly variable within a single hair shaft; authors argue for geographic relocations.

A Williams and Katzenberg 2012 JAS article discusses hair results from P-H cemetery (outside Lima), human. Average $\delta^{13}$C of -13.2 (and $\delta^{15}$N of 10.0).

### Carbon and Nitrogen Results from Bone Collagen (Ribs)

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Individual</th>
<th>$\delta^{13}$C (‰), vs. VPDB</th>
<th>$\delta^{15}$N (‰), vs. AIR</th>
<th>C:N</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO-15-3040</td>
<td></td>
<td>-15.84</td>
<td>10.46</td>
<td>3.5</td>
</tr>
<tr>
<td>CO-15-3041</td>
<td></td>
<td>-16.41</td>
<td>9.23</td>
<td>3.4</td>
</tr>
<tr>
<td>CO-15-3042</td>
<td></td>
<td>-13.29</td>
<td>7.75</td>
<td>3.2</td>
</tr>
</tbody>
</table>

The carbon values indicate high consumption of C4 plants. These nitrogen values are quite enriched for animals (comparable to humans).

### Tooth enamel results – Carbon and Oxygen

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Individual</th>
<th>$\delta^{13}$C (‰), vs. VPDB</th>
<th>$\delta^{18}$O (‰), vs. VPDB</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN-16-3384</td>
<td>M43-1355 ; lower RM1</td>
<td>-4.44</td>
<td>-6.32</td>
</tr>
<tr>
<td>EN-15-3385</td>
<td>M10-1163 ; Upper M1 / dM2?</td>
<td>-7.21</td>
<td>-4.03</td>
</tr>
</tbody>
</table>
## Tooth enamel results – Strontium

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Individual</th>
<th>87Sr/86Sr</th>
<th>error</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN-16-3384</td>
<td>M43-1355 ; lower RM1</td>
<td>0.707083</td>
<td>0.0000095</td>
</tr>
<tr>
<td>EN-15-3385</td>
<td>M10-1163 ; Upper M1 / dM2?</td>
<td>0.707472</td>
<td>0.000012</td>
</tr>
</tbody>
</table>

## Tooth enamel results – Lead

<table>
<thead>
<tr>
<th></th>
<th>208/204</th>
<th>error</th>
<th>207/204</th>
<th>error</th>
<th>206/204</th>
<th>error</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC-3385</td>
<td>38.6486</td>
<td>0.0028</td>
<td>15.6077</td>
<td>0.0012</td>
<td>18.2668</td>
<td>0.0014</td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY

Allsen, Thomas T.

Alva, Walter

Alva, Walter and Christopher B. Donnan.

Arnold, Charles D.

Atwood, Roger

Azua, Raúl Valadez, Alicia Blanco Padilla, Bernardo Rodríguez Galicia, and Gilberto Perez Roldán
2013  The Dog in the Mexican Archaeozoological Record. In *The Archaeology of Mesoamerican Animals, Archaeobiology* 1, Christopher M. Götz and Kitty F. Emory, editors. Lockwood Press, Atlanta.

Bamford, Kathryn A.

Bank, Michael S., Ronald J. Sarno, Nichole K. Campbell, and William J. Franklin

Baxter, Ian L.

Belknap III, Samuel
Benfer, R. A.

Bennett, A.

Briggs, Jean L.

Bingham, Hiram

Brothwell, Don, A. Malaga and Richard Burleigh

Burleigh, Richard, and Don Brothwell

Carneiro, R. L.

Clutton-Brock, J.

Cobo, Bernabé, and Roland Hamilton

Cummins, Bryan David.

De Ayala, F. G. P.
D’Altroy, Terence N., and Timothy K. Earle

Deely, John

deFrance, Susan D

deFrance, Susan D.

deFrance, S. D., D.K. Keefer, J.B. Richardson, and A.U. Alvarez

de la Vega, El Inca, Garcilasco

de Pastino, Blake
2006  Photo in the News: Dog Mummies Found in Ancient Peru Pet Cemetery. 

Derr, Mark

Dillehay, Tom D., and Carlos Ocampo

Donnan, Christopher B.


Douglas, Mary

Eaton, GF.  

Engel, F.  

Fleming, Stuart  

Franklin, Jon  

Frantz, Laurant A. F., Victoria E. Mullin, Maud Pionnier-Capitan, Oph´elie Lebrasseur, Morgane Ollivier, Angela Perri, Anna Linderholm, Valeria Mattiangeli, Matthew D. Teasdale, Evangelos A. Dimopoulos, Anne Tresset, Marilyne Duffraisse, Finbar McCormick, László Bartosiewicz, Erika Gál, Éva A. Nyerges, Mikhail V. Sablin, Stéphanie Bréhard, Marjan Mashkour, Adrian Bălășescu, Benjamin Gillet, Sandrine Hughes, Olivier Chassaing, Christophe Hitte, Jean-Denis Vigne, Keith Dobney, Catherine Hänni, Daniel G. Bradley, and Greger Larson.  

Goepfert, Nicolas  
2012 New Zooarchaeological and Funerary Perspectives on Mochica Culture (A. D. 100-800), Peru. In *Journal of Field Archaeology* 37 (2):104-120.

Goffman, Erving  

Goldstein, Paul S.  
Grimm, David

Guaman Poma de Ayala, F.

Harris, Marvin

Hill, Erica

Homans, John

Hoshower, Lisa M., Jane E. Buikstra, Paul S. Goldstein, and Ann D. Webber

Jackson, Margaret A.

Janusek, John Wayne


Kellner, CM and Schoeninger, MJ.

Kerber, J.
Knudson, Kelly J., Ann H. Peters, and Elsa Tomasto Cagigao

Koster, Jeremy

Krueger, H.W. and C. H. Sullivan


Kuznar, Lawrence A


Lee-Thorp, JA, Sealy, JC and van der Merwe, NJ.


Lévi-Strauss, Claude
Lewis, Brenda Ralph

Lofaro, EM.
2012 Isotopic Analysis of Chanka Mobility and Diet in the Central Highlands of Peru (~AD 1000-1450). Unpublished Master’s Thesis, Department of Anthropology, University of Florida, Gainesville, FL.

Lumbreras, L.

Meir, M.

Merriam-Webster's Collegiate Dictionary, 10th ed.
1999 Merriam-Webster Incorporated, Springfield, MA.

Miller, George R.

Miller, Suzanne C., Cathy Kennedy, Dale DeVoe, Matthew Hickey, Tracy Nelson, and Lori Kogan

Moore, Jerry D., editor
2009 Visions of Culture: An Annotated Reader. AltaMira Press, Latham, MD.

Morey, Darcy F.

Morey, D.F., and M.D. Wiant
Moseley, Michael E.

Moseley, Michael E., Donna J. Nash, Patrick Ryan Williams, Susan D. deFrance, Ana Miranda, and Mario Ruales

Mulville, Jacqui, Richard Madgwick, Adrienne Powell, and Mike Parker Pearson

Muñoz Carmago, Diego

Pluskowski, Aleksander, editor

Prummel, Wietske

Reitz, Elizabeth J.

Rice, P. M.

Riddle, Maxwell

Rowe, J.H.

Sánchez, V. F. V., Tham, T.E.R., and G.D. Pérez

Sandweiss, Daniel H., and Elizabeth S. Wing
Savage, R.J.G., and M.R. Long

Savoilainen, Peter, Ya-ping Zhang, Jing Luo, Joakim Kundeberg, and Thomas Leitner

Schwartz, Marion


Silver, I. A.

Snyder, Lynn M., and Elizabeth A. Moore, eds.

Spurgeon, Caroline

Stahl, Peter

Sumner-Smith, G.

Thompson, Ann, and John O. Thompson
Thurston, Mary Elizabeth

Tibali, Anne
2010  *Imperial Subjectivities: The Archaeological Materials from the Cemetery of the Sacrificed Women, Pachacamac, Peru*. Dissertation, Graduate School of Binghamton University, State University of New York.

Turner, Victor

Urton, Gary

van Asch, Barbara, Ai-bing Zhang, Mattias C.R. Oskarsson, Cornelya F.C. Klütsch, António Amorim, and Peter Savolainen

Verano, John W.
1997  Human Skeletal Remains from Tomb 1, Sipán (Lambayeque River Valley, Peru); and their Social Implications. In *Antiquity* 71.273: 670-682.

Von Uexküll, Jakob, Marina von Uexküll, and Joseph D. O'Neil

Vila, Carles, Peter Savolainen, Jesus E. Maldonado, Isabel R. Amorin, John E. Rice, Rodney L. Honeycutt, Keith A. Crandall, Joachim Lundeberg, and Robert K. Wayne

Wade, Terry

Wade, Lizzie
Walker, R.B., D.F. Morey, and J.H. Relethford

Walsh, George E.

Wayne, R. K.

Werner, Louis


Williams, Jocelyn S., and M. Anne Katzenberg
2012 Seasonal Fluctuations in Diet and Death During the Late Horizon: A Stable Isotopic Analysis of Hair and Nail from the Central Coast of Peru. In *Journal of Archaeological Science* 39:41-57.

Wing, Elizabeth S.
1990 *Faunal Remains from Chilca*. In accession files database, Florida Museum of Natural History, Gainesville.

Wheeler, J.
BIOGRAPHICAL SKETCH

Michael Wylde returned to academia late, receiving a BA in anthropology from Florida Gulf Coast University, then a Master of Arts in anthropology with a concentration in zooarchaeology from the University of Florida. Wylde has worked in Mexico, Honduras, New Mexico, Georgia, Florida, Bali, and Peru, and received his PhD from the University of Florida in the summer of 2017. This dissertation unites two subjects that have fascinated Wylde since childhood, dogs and archaeology.