The Royal Presidio of Monterey: a socio-cultural analysis based on zooarchaeological remains

Jennifer A. Lucido

California State University, Monterey Bay

Follow this and additional works at: https://digitalcommons.csumb.edu/caps_thes

Recommended Citation
https://digitalcommons.csumb.edu/caps_thes/389

This Capstone Project is brought to you for free and open access by Digital Commons @ CSUMB. It has been accepted for inclusion in Capstone Projects and Master's Theses by an authorized administrator of Digital Commons @ CSUMB. Unless otherwise indicated, this project was conducted as practicum not subject to IRB review but conducted in keeping with applicable regulatory guidance for training purposes. For more information, please contact digitalcommons@csumb.edu.
THE ROYAL PRESIDIO OF MONTEREY:
A Socio-cultural Analysis Based on Zooarchaeological Remains

By
Jennifer A. Lucido
California State University Monterey Bay
Social and Behavioral Sciences, Archaeology

Spring 2012
Table of Contents

Introduction ............................................................................................................................................. 2

Historical Context ................................................................................................................................. 5
  Spanish Colonialism in Alta California ................................................................................................. 6
  Socio-cultural Intersectionality in the Presidios .................................................................................. 11
  Introduction of Domestic Animals into Alta California ................................................................. 14

Zooarchaeological Studies of Mission Era Sites ................................................................................. 17
  Archaeology of the Royal Presidio Chapel of Monterey .............................................................. 17
  Comparative Case Study: Mission San Juan Bautista ................................................................. 20

Literature Review .................................................................................................................................. 21
  Introduction ........................................................................................................................................ 21
  General Approaches to Faunal Analysis .............................................................................................. 22
  Research Focus on Faunal Remains ..................................................................................................... 26
  Theoretical Frameworks of Cultural Contact Studies ...................................................................... 27

Methodology .......................................................................................................................................... 34
  General Approach ............................................................................................................................... 34
  Studies on the Identification of Cultural Modifications on Faunal Remains .................................. 37
  Experimental Archaeology: Recreating Spanish Colonial Butchery ............................................ 41

Findings ................................................................................................................................................ 42
  Identified Skeletal Elements .............................................................................................................. 42
  Cutmark Typology ............................................................................................................................ 45
  Identified Skeletal Elements and Cutmark Typology ...................................................................... 46
  Faunal Assemblage by Trench ........................................................................................................... 47
  Experimental Archaeology: Procedures and Results ......................................................................... 48

Discussion of Findings ........................................................................................................................... 55
  Comparative Analysis: Mission San Juan Bautista ........................................................................... 55
  Findings of Butchery Patterns at Other Spanish Colonial Sites in Alta California ...................... 56
  Mission Era Butchery Technology ................................................................................................... 60
  Experimental Archaeology: Analysis with Royal Presidio of Monterey Collection ..................... 62

Conclusion ............................................................................................................................................. 71

Acknowledgements ............................................................................................................................... 75

Bibliography ........................................................................................................................................... 76

Appendices ............................................................................................................................................ 83
  Appendix I: Index of Faunal Assemblages by Trench .................................................................... 84
  Appendix II: Faunal Index Image Catalog ......................................................................................... 90
  Appendix III: Experimental Spanish Colonial Butchery ............................................................... 21
Abstract

The Royal Presidio of Monterey served as the focal institution of military power and government of Alta California from ca. 1770 to 1840 during the Spanish colonial missionization of the indigenous populations. Like the Franciscan missions, the Royal Presidio of Monterey was a multicultural settlement, home to Spanish soldiers, mestizo settlers, and Native Californians. During archaeological monitoring of the Royal Presidio of Monterey, spanning from 2006 through 2008 which was conducted by Dr. Ruben Mendoza and his field crew of California State University, Monterey Bay students, significant Mission era architectural features were discovered and identified, in addition to the recovery of rich material culture and great quantities of faunal assemblages. Through the investigation of those recovered faunal remains, this capstone project examines the cultural modifications or cutmark patterns produced during butchery practices and consumption patterns and the relationship of such to socio-cultural identities within the Presidio demographic. In addition, butchery patterns can aid in the identification of certain types of cutmarks and tool technologies that created them of which may represent a cultural group, such as distinctions between Native Californians and Spanish colonists. Furthermore, an experimental archaeology component is highlighted in this capstone project which attempted to replicate those modifications on the faunal remains with the intentions of identifying the cutting implements and any socio-cultural indicators that produced said cutmarks. Ultimately, this capstone offers preliminary hypotheses of which further research is necessitated in order to draw more conclusive evidence of socio-cultural markers in the faunal assemblages of the Royal Presidio of Monterey.

Introduction

David Collyer and I have undertaken the study and analysis of faunal remains, or zooarchaeology, recovered from the Royal Presidio Chapel of Monterey (also known as the San Carlos Cathedral) during the archaeological investigations spanning the period of 2006 through 2008 conducted by Dr. Ruben Mendoza and his field crew of California State University, Monterey Bay (CSUMB) students (this site is denoted in archaeology as CA-MNT-271h). The Presidio of Monterey was also known as El Presidio Real de San Carlos de Monterey during the reign of the Spanish Crown in the New World (i.e. the Americas) and became one of the most powerful military institutions in not only Alta California, but also in Baja California. Faunal assemblages (animal bones) can be studied to assess socio-cultural variation and status as reflected in the butchery patterns or cultural modifications on the faunal collections, as such is the area of focus in this capstone study. The faunal remains that represent these cultural modifications from the Royal Presidio are in compared with Mission San Juan Bautista, one of
the twenty-one missions in California, as based on the thesis study “Mission San Juan Bautista: Zooarchaeological Investigations at a California Mission,” by Michelle St. Clair of California State University, Chico (St. Clair 2004); furthermore, the additional investigation of faunal assemblages from other Mission or Colonial era (circa 1770-1835) sites are included in this study. The Royal Presidio was primarily occupied by Spanish (mestizo) soldiers and settlers, and to some extent, Spanish Franciscan friars, while Mission San Juan Bautista was occupied by the Costanoan or Mutsun Native Californian tribe and the Franciscan missionaries as products of the Spanish colonialism movement in California, constituting these establishments as contemporary institutions.

Our interest in the analysis of the faunal remains from the Royal Presidio of Monterey stemmed from our experience participating in archaeological excavations in the spring of 2011 at Mission Nuestra Señora de la Soledad (CA-MNT-233H), the thirteenth mission of Alta California. Our work served as part of the continuation of the CSUMB Institute for Archaeology. This program promotes the education of students in archaeology and contributes to the growing evidence of material culture, faunal remains, as well as evidence of architectural features at the site (i.e. Mission Soledad). When we worked at Mission Soledad over a nine week period, we excavated in Unit N7.5E6.5, a sampling unit of the archaeological site, in what currently serves as active farmland, and recovered architectural features, diverse material cultures, and faunal assemblages; the faunal remains were among one of the most prominent types of material we exhumed during the field season.

Based on the archaeological evidence recovered from Unit N7.5 E6.5, we concluded that the site might have been construed as a hearth and/or kitchen site (cookery) of the Neophyte Housing Area or potentially inside a room block within the vicinity of the Neophyte Housing
Area at Mission Soledad. Evidence was taken to imply that the site was actively processing and depositing materials as a part of daily mission life. Therefore, from this experience in archaeology, Collyer and I were interested in studying Mission era materials further, and in this capstone project, we have concentrated on the faunal assemblages from the Royal Presidio of Monterey (made available by Dr. Ruben Mendoza) in comparison with that of the faunal collection from Mission San Juan Bautista as studied by St. Clair in her Master’s thesis. From examining these faunal remains, Collyer and I sought to identify those butchery and cutmark patterns that relate to socio-cultural distinction and status relevant to those soldiers, Native Californian, and other occupants of the Royal Presidio of Monterey. In addition, as part of this capstone project, Collyer and I conducted an experimental archaeology component of which attempted to replicate those butchery patterns on the faunal assemblages with the intentions of identifying the cutting implements and any socio-cultural indications that produced said cutmarks.

The guiding research questions that Collyer and I intend to address include the following:

1) To what extent does the introduction of cattle affect consumption patterns of both the populations at the Royal Presidio of Monterey and Mission San Juan Bautista?

2) How do butchery patterns and cutmarks on the faunal remains at the Royal Presidio and those studied by St. Clair at Mission San Juan Bautista provide indications of cultural, social, and/or economic level?

3) What zooarchaeological and/ or socio-cultural data can be derived from the attempted simulation of cutmark patterns on modern-day cattle have and how does this contribute to the body of knowledge to the field of faunal studies?
Historical Context

Immediately after the Feast of Pentecost, hand was put to building a stockade, and inside of it some humble habitations for the royal presidio and mission. For a site a level place was chosen on the shore of an estuary which, in the rainy season, fills up and communicates with the sea, a little more than a gunshot from the beach and in sight of the harbor, from which it is distant only three gunshots. This plain is on the slope of the Point of Pines, with which trees the plain is also covered. Engineer Don Miguel Costanzó made his measurements on it and drew the plan of the presidio, and at one side of it the mission, all the people moving to it. With this act a beginning was made of the royal presidio and mission.


Figure 1: East vantage point from Lake El Estero (the estuary) facing west toward the Royal Presidio of Monterey as observed and illustrated by Richard Brydges Beechey, circa 1826-27. Note that the above 1770 description by
Spanish Colonialism in Alta California

The Spanish Empire continued to establish colonial territories in North America after two centuries (beginning in the 16th century) of imperial rule in Central and South America (Lake 2006). The Spanish Empire intended to expand its territories and subjects from New Spain, or Mexico northwards through Alta California in order to secure this land claimed by Spain from the threat of foreign invasion, such as from the Russians; having already procured a colonial presence in Baja (lower) California, Alta (upper) California became the succeeding territory to colonize. Given the large regions of California, it was necessary for the Spanish to establish a chain of settlements, which included the missions, presidios, and pueblos, that would more efficiently integrate the indigenous populations into new communities under Spanish control (see Figure 2, below). The Spanish colonial agenda was to implement Catholic conversion and “civilization” (i.e. through the Franciscan missions) to the Native Californians, set up local government (i.e. the presidios and pueblos), which together would help to establish a self-sufficient mestizaje or fusion of cultural, religious, political, and economic resources for Spain and New Spain (Ayres 1995).

The first element of Spanish colonization of Alta California was the mission. Scholar Elizabeth Graham (1998) defines a mission as consisting of three interconnected processes: first, a mission is a part of a colonizing movement, beginning with the encounter or “contact” with the Americas as part of the conquest of territory; second, a mission represents the spread of the Christian faith by the European church and Spanish Franciscan missionaries through proselytizing to the indigenous peoples; and thirdly, a mission consists of the enculturation of the
Native Californian populations into colonial European culture. Part of this missionization process was the implementation of the *reducción*, or the centralization of indigenous populations at a mission site to serve as laborers to support the mission and presidio communities, and ultimately to serve as the newly Hispanicized and Christianized subjects or neophytes of Spain (Ayres 1995).

The second element of Spanish colonization included the presidios, of which four were established in Alta California. Presidios were those military garrisons in the New World which also served as a penitentiary for criminal offenders (Williams 2004). Said offenders could then serve as laborers at the presidios for public construction (Williams 2004). The roles of the four presidios in California were to protect the colonial territory Spain claimed as well as provide military protection for the four to six missions in their respective vicinities (Honig n.d.). The four presidios included San Diego, (founded 1769), Monterey (1770), San Francisco (1776), and Santa Barbara (1782); the soldiers that protected and resided in these garrisons were from the heart of New Spain. The presidios were situated along the coastline at a mile distance in order to ensure safety from enemy warships (Lake 2006). In order to survive in this new territory, the soldiers also had to adapt to nonmilitary duties. Soldiers would partake in supervision of the missions in regards to ceremonies, inventory of supplies, equipment, and food, and other mission activities (Lake 2006). The presidios were part of the foundations for the establishment of civilian settlements (i.e. pueblos and ranchos) that developed the Americas from which many modern cities in both the United States and Mexico were the product of the presence of these presidios (Williams 2004).
Figure 2: Map of Alta California Spanish colonial settlements of presidios, missions, and pueblos from *Converting California* (Sandos 2004). Refer to the legend in the above right-hand corner for distinctions between these settlements, including different Native Californian tribes. The Royal Presidio of Monterey constitutes one link in this chain of Spanish colonial establishments founded from 1769 to 1823 as noted by the red arrow.
Both the missions and presidios were dependent on supplies from Western Mexico or New Spain, (i.e. San Blas) (Hackel 1997). In addition, these supplies ships also carried payment for the presidios and the soldiers (365 pesos/year for ordinary soldiers) (Honig n.d.). However, there were issues with the condition of supplies (i.e. spoilage, infrequency, etc.) upon their arrival due to the unreliability of the ships, not only affecting the basic foodstuff and manufactured items for the missions and the presidios, but also foregoing the soldiers’ salaries (Hackel 1997; Honig n.d.). As a result, the missions developed into a source of supplies stored with basic goods and foods for the presidios and ultimately had purchasing power to acquire the goods that could not be manufactured on site, such as those produced in Mexico or Spain (Hackel 1997).

The emphasis of this capstone study is upon the Royal Presidio of Monterey (see Figure 3, below) and those culturally modified faunal assemblages recovered from this site during archaeological investigations spanning 2006 through 2008, and directed by Dr. Mendoza and his CSUMB student field crews. The Presidio of Monterey was a center of government in California for seventy years and was home to mestizo soldiers, Spanish soldiers and missionaries, and Native Californians (Howard 1981). The Presidio and the associated mission, San Carlos de Borromeo de Monterey (also known as Mission San Carlos), were established on June 3rd of 1770. Mission San Carlos, however, such was moved to Carmel in 1771 by founding missionary president, Fray Junípero Serra. Among one of the most important buildings of the Presidio of Monterey included the Royal Presidio Chapel. There were a total of three chapels: the first was constructed of pole and brush (also referred to as jacal) and palizada (perimeter wall) which likely served dual functions to have functioned as storeroom or warehouse; the second was built in 1772 of adobe with basalt stone and shale foundations; and the third was built of shale stone in
The stone church was built according to the architectural design by Manuel Ruiz, a stonemason, and was completed in 1794 (construction began in 1791) (Howard 1978). The façade of this third chapel was originally planned by Antonio Velásquez, the Director of the Academy in San Carlos, Mexico. However, Velásquez’s rendition was not entirely executed and was modified in favor the Ruiz designed façade of which stands today. The cultural modifications marking the faunal remains that were excavated from trenches around the perimeter of this final chapel of the Royal Presidio are the emphasis of this study.

**Figure 3:** This illustration is a conjectural view of the Royal Presidio of Monterey, ca.1800, by Jack S. Williams (1993); (cardinal directions added by author). Note that the 1794 stone church, the third and final Presidio Chapel, centered between the Soldiers’ Barracks of 1778-79 west of the church or adjacent to the upper right ravelin and Padres’ Quarters of 1778 east of the church and south of the Bell Tower, or adjacent to the upper left ravelin. The Terrace of 1780-90 would have been situated south of the Padres’ Quarters. During the archaeological monitoring of the Royal Presidio Chapel in 2007-08, the trenching operation paralleled the perimeter of the church of which the
Soldiers’ Barracks and Padres Quarters were once attached; the faunal remains examined in this capstone study were recovered from these trenches.

**Socio-cultural Intersectionality in the Presidios**

After the initial colonial establishment in 1769 in San Diego, approximately 1000 immigrants from New Spain (Mexico), including Sinaloa, Sonora, and Baja California, moved to Alta California; by 1774, 170 soldiers, of which 94 lived at the Presidio of Monterey and/or were assigned to guard Mission San Carlos Borromeo. By 1781, some 472 settlers or pobladores and soldiers of New Spain came to settle in the presidios of San Francisco and Santa Barbara in addition to those civilian settlements of San Jose and Los Angeles (Hackel 2005: 56). These soldiers were in part of two designations: those soldado de cuera, or leather jacket and voluntarios de Cataluña, or the Catalanian volunteers (Howard 1976: 103). It should be noted that Spanish-born (born in Spain) settlers were predominately limited to that of the Franciscan friars, with the exception of individual Spaniards in Alta California (Hackel, 2005); however, those non-Indians were often identified through a movable caste system as follows: Spanish or español (of Spanish/Hispanic descent), mestizo (half Spanish/white and half Indian), mulatto (half Spanish/white and/or Native and half black), and coyote (three-fourths Indian and one fourth Spanish/white) (Hackel 2005: 59). Distinctions between these specific groups were more of cultural and socio-economic significance than ethnic significance (Hackel, 2005); for example, mobility of racial identity was attainable through certain types of employment, as in the case with those culturally and ethnically diverse soldiers serving the presidios of Alta California (Hackel 2005; Honig n.d.). Furthermore, these groups of soldiers and settlers considered themselves gente de razón or the people of reason as opposed to the Native Californians or indios who were viewed as sin razón, or without reason (Hackel, 2005). At the Presidio of
Monterey, these population demographics (see Figure 4, below) were documented from 1790 to 1832 (McLaughlin and Mendoza 2009).

<table>
<thead>
<tr>
<th>Year</th>
<th>1790</th>
<th>1800</th>
<th>1810</th>
<th>1820</th>
<th>1832</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military</td>
<td>62</td>
<td>110</td>
<td>121</td>
<td>117</td>
<td>54</td>
</tr>
<tr>
<td>Other gente de razón</td>
<td>116</td>
<td>234</td>
<td>344</td>
<td>445</td>
<td>799</td>
</tr>
<tr>
<td>Indios</td>
<td>11</td>
<td>12</td>
<td>18</td>
<td>27</td>
<td>89</td>
</tr>
<tr>
<td>Total</td>
<td>189</td>
<td>356</td>
<td>483</td>
<td>589</td>
<td>942</td>
</tr>
</tbody>
</table>

**Figure 4**: This table of population statistics has been replicated from the *The California Missions Source Book: Key Information, Dramatic Images, and Fascinating Anecdotes Covering all 21 Missions* (McLaughlin and Mendoza 2009; table prepared by Jennifer A. Lucido, 2012). Note the increase of size in all population statistics from 1790 to 1832, most significantly that of the demography of the other *gente de razón*. Also significant, given these demographics, is the Native Californian or *indios* population which maintained a minority status. In an 1800 (see Figure 1, above) description of the Presidio, there is a reference by Raymund Carillo, Commander of the Company, in which he notes that there are nine living rooms for the families of the troops, included in the other *gente de razón* demographic (Howard 1978: 116); however, given that soldiers would also intermarry Native Californian women, it is not clear in this reference if such is purely other *gente de razón* or if such also references those *indios*.

After having established colonial settlements in Alta California, the presidios employed Native Californian laborers. This was in part due to the inconsistent presence many of the soldiers at the presidios. Such was the case in the *escoltas* or those soldiers (typically about four to six) stationed at the missions (Honig n.d.). In addition, many soldiers were resistant to
working beyond their required military duties and therefore required Indian labor for performing those domestic and skilled tasks (Hackel 1997). Native laborers are categorized into convicted labor and mission contract labor (Hackel 1997; 2005). Both convicted and contract day laborers or *presidarios* did not receive financial reimbursement, however the missions that contracted neophyte laborers did receive compensation with *pesos* (Hackel 1997). Gentile (not baptized, non-neophyte) Native Californians were also employed at presidios, but more commonly served the settlers in the pueblos (Hackel 2005). The native laborers’ contributions were critical to the subsistence of the presidios and their military occupants. For example, nearly every year after 1785 until 1810, an average of approximately ten neophyte day laborers were contracted from Mission San Carlos to work at the Presidio of Monterey. In addition, records from 1790 to 1796 indicate that a minimum of eighteen gentile Native Californian laborers were also contracted to the Presidio of Monterey (Hackel 2005).

In addition to the considerable involvement of the missions, the presidios and their associated colonial establishments also greatly impacted the indigenous peoples Alta California socially, culturally, and economically. The soldiers and their succeeding generations became significant to the later *rancho* elite of California, along with intermarriage with those civilian settler families of New Spain (Mexico), including Sinaloa, Sonora, and Baja California (Hackel 2005; Honig n.d.). The *Californio* contributed to the cultivation the Hispanic population of Alta California, and their descendants and supporters continue to form an active part of community life today in those former presidio and mission settlements (Honig n.d.).
Introduction of Domestic Animals into Alta California

Iberian cattle were first introduced into the New World, and into California, by the Spanish colonists by way of Mexico and Baja California (Gust 1991). The cattle that were introduced to Mexico were that of imported Spanish origin from the sixteenth century (Gust 1991). These cattle originated from the Old World (Europe), specifically from Andalucian stock of which were medium-sized and varied in phenotype (visual characteristics); in addition, Castilian stock of larger and black were introduced to the New World although were typically used in bullfights (Gust 1991). However, it should be noted all European domesticated cattle are of a single species, that of *Bos taurus* and consists of many varieties in breed (Gust 1991). When the initial journey from Baja California to San Diego in Alta California began, the Baja missions collectively donated some two hundred cattle, 46 horses, and 140 mules (Burcham 1961). Additional animals were introduced to California over the first few years of the missionary program, including 1,050 (of which 350 were cattle) livestock from the Presidio of Tubac in Arizona (Burcham 1961).

Cattle ranching was one of the first major colonial industries of Alta California as and ultimately contributed to succeeding economies in California and the Southwest (Burcham 1961). This industry provided meat, leather, hide and tallow, and other products. Under the missions with their extensive grasslands, the new livestock flourished (Burcham 1961). Projections of livestock size suggest that between 230,000-400,000 head of cattle were under mission control during the years 1821-1832 (Burcham 1961; McLaughlin and Mendoza 2009); further projections based on land sustainability are as high as 1.86 million (Burcham 1961). In addition to the core settlements, each mission operated at least one *rancho* or ranch offsite to raise and supply livestock (Burcham 1961; Gentilcore 1961). Oftentimes there was sufficient
forage provided by California pasture lands which aided in the maintenance of these animals. Based on studies of Spanish colonial occupations in the New World (including that of Hispaniola, Cubagua, and Spanish Florida), it was found that the faunal remains of cattle and pig were most abundant (Reitz 1992). Such is attributed to their higher ability to adapt to the new environments (Reitz 1992). In contrast, these studies also found that the sheep embodied a lower representation in the faunal remains and therefore were likely challenged in their adaptation to the New World (Reitz 1992). Ultimately, the numbers of livestock were reflective of the populations and the environments that missions occupied (Gentilcore 1961). Given the rise of the cattle and its eventual dominance as a socioeconomic industry in Alta California throughout the Mission, Mexican, and American eras, Douglas Monroy asks “was beef such an attractive and easily obtainable food source that the [Native Californian] Indian ranch hands readily adapted the cattle culture?” Regardless of whether Native Californian participation in the cattle industry was intentional or coerced, native laborers were instrumental in the perpetuation of “cattle culture” that supported their dietary and other needs as represented in the archaeological record.

Also as a result of the introduction of these new animals to Alta California, including that of cattle, pigs, goat, and sheep, there was great ecological change (Hackel 2005). By 1783, at Mission San Carlos, there was a total of 874 animals (500 of which were cattle) of which proved overwhelming as the numbers grew (see Figure 5, below) and consequently overrun Indian lands, fields, and villages (Jackson and Castillo 1995). However, neophytes were permitted one to two week² annual paseos or retreats from the missions during which neophytes could collect additional foods which at times was necessary in order for providing suffice food, interact with

2 Duration and frequency of paseos varied per mission.
gentiles (un-baptized or non-missionized Indians), and so forth (Hackel 2005). The Presidio of Monterey endured similar conflicts with the cattle and herds, with overgrazing and drought, resulting in the exportation of cattle to the pueblo of Los Angeles in 1781 (Hackel 2005); by 1800, the presidio had 1,275 cattle and over 7,000 horses (Hackel 2005:71). In addition, the introduction of Old World plants and agriculture accompanied the ecological colonization of Alta California (Hackel 2005). Said introductions in turn displaced native plants (Hackel 2005). Ultimately, these alterations in the indigenous cultural and physical geographies permitted for the establishment of new economies at local and global levels.

![Figure 5: This line graph of livestock reported from Mission San Carlos, 1775-1834 has been recreated and modified from the table within Indians, Franciscans, and Spanish Colonization: The Impact of the Mission System on California Indians (Jackson and Castillo 1995; line graph prepared by Jennifer A. Lucido, 2012). Note the increase of cattle after 1775 until such reached its height in about 1805.](image)
Zooarchaeological Studies of Mission Era Sites

This capstone study is centered upon those faunal remains recovered from recent archaeological monitoring of the Royal Presidio of Monterey. Furthermore, the below section describes the other findings of material culture and significant architectural features found in association with those faunal remains. Additionally, the faunal findings from this recent excavation are contrasted with the comparative case study of those archaeological investigations and faunal recoveries from Mission San Juan Bautista. These two sites constitute Spanish colonial contemporaries that would have maintained socio-cultural and economic interactions during the Mission era.

Archaeology of the Royal Presidio Chapel of Monterey

In a recent report titled “Archaeology of the Royal Presidio Chapel: An Archaeological Resources Assessment of the Presidio Reál de San Carlos de Monterey, CA-MNT-271H, Monterey County, CA,” by Ruben G. Mendoza documents the five phase investigations and assessments of those cultural and historical resources undertaken at the Royal Presidio Chapel of Monterey during periods extending from 2006 through 2008 (2012). Phases 1 and 2 of archaeological testing of excavation units, potholes, and trenching were undertaken in 2006 and 2007. Such included an extensive trenching operation (a total of thirty-one trenches, see Figure 6, below; and for the complete reference, see Appendix I: Index of Faunal Assemblages by Trench) that traversed the perimeter of the Royal Presidio Chapel during Phase 3 in 2007 (Mendoza 2012).

In addition, Phase 4 of the archaeological investigations began in 2008, and centered on the excavation and mitigation of the Serra Chapel of 1772 (Mendoza 2012). Significant Mission
or Colonial era architectural features were discovered and identified, including the following: the Terrace 1 feature of which was identified with the original south wall of the Chapel of 1794; the Chapel of 1772, or the second chapel built at the Presidio, or the earliest adobe documented in Alta California; foundations of the 1778-79 Padres’ Quarters; foundation footings of the Sacristy of 1778; foundations of the 1810 Baptistery; foundations of the 1778 southern defensive curtain or south wall of the Soldiers’ Barracks and Padres’ Quarters; and finally, on the last day of the project, decomposed footings of granite and timber, as well as middens associated with the Chapel of 1770. The latter is thought by Mendoza to constitute the first Presidio structure (Mendoza 2012). In addition, during the course of archaeological monitoring of this site, rich and diverse material cultures (significantly those diverse collections of ceramic and earthenwares) and great quantities of faunal remains (notably that of cattle) were recovered (Mendoza 2012).

Furthermore, the faunal remains excavated from the Terrace 1, archaeological feature have since been identified within a 1808 midden (this deposit was dated through the identification of Tlaquepaque wares and other majolica ceramic shards) indicate a change in diet from those marine assemblages associated with the 1770-78 settlement periods (i.e. 1770 to those later periods in which presence of cattle was strong and indicative of ranching industry that supported consumption patterns of those occupants at the Presidio of Monterey) (Mendoza 2012). In addition, significant quantities of faunal remains were recovered from the aforementioned trenching operation (Mendoza 2012). Those culturally modified faunal remains from the aforementioned trenching operations are the subject of this capstone study.
Figure 6: (Not drawn to scale). This figure has been recreated from the Royal Presidio of Monterey field notebook of Dr. Mendoza as documented on June 28, 2007. This diagram depicts those numbered trenches as dashed lines circumscribing the perimeter of the Royal Presidio Chapel of Monterey. It should be noted that only fourteen trenches (of the thirty-one trenches) skirt the perimeter while the remaining seventeen trenches (not depicted in this diagram) were situated beyond the immediate vicinity of the Royal Presidio Chapel. (Mendoza 2007; illustration by Jennifer A. Lucido, 2012).
Comparative Case Study: Mission San Juan Bautista

Michelle C. St. Clair’s thesis examined the faunal remains recovered from archaeological investigations of the mission courtyard and neophyte housing of Mission San Juan Bautista (2004). St. Clair anticipated that her archaeological examination at Mission San Juan Bautista would provide evidence of cultural change among the Ohlone Mutsun Native Americans as a result of contact with the Spanish culture. St. Clair structured her thesis about Mission San Juan Bautista into chapters that elaborated on the following aspects: historical context of the missionization of Alta California; the natural environment with respect to Mission San Juan Bautista; significant archaeological projects; the theoretical perspectives that guided her research; methodologies in examining the faunal evidence; and finally, her findings and conclusions about the faunal remains (2004).

The previous archaeological investigations at Mission San Juan Bautista span the following period extending from 1961 through 1991. These include John Clemmer (1961), the Rob Jackson (1985), Herb Dallas (1989), Glenn Farris (1991), Ruben Mendoza (1995-2001). The latter excavations proved most significant in St. Clair’s studies of acculturation through the analysis of those faunal remains. The Farris excavation included the neophyte housing area (CA-SBN-193H), where the Native Californian converts would have resided while the Mendoza excavations included the mission courtyard area (CA-SBN-1H), the center of mission life at San Juan Bautista (St. Clair 2004). St. Clair’s methodology was predicted on the recovery of faunal materials from previous archaeological excavations, primarily the Farris and Mendoza investigations (St. Clair 2004). These remains were then cataloged and identified by class (mammal, bird, fish) (St. Clair 2004). The bones were then further defined by identifiable characteristics including the following: portion of element, side, location (on site),
sex/age/fusion, relative size, surface condition, natural/cultural modifications, and the presence and/or degree of burning (St. Clair 2004). Ultimately, St. Clair sought to interpret the faunal remains with the intentions of identifying markers of cultural change (i.e. type of butchery cuts and marks) in the subsistence patterns of the missionaries and Mutsun during the mission period (2004).

**Literature Review**

*Introduction*

Prior studies of faunal (animal) remains in archaeological investigations have indicated that faunal remains offer information about a given human group’s way of life particularly where environment and cultural phenomena adaptation are concerned (Schlesinger 2008; Lyman 1977). Studying the remains as archaeological evidence, researchers have learned that such provides insights in a variety of social and behavioral aspects that aid in the reconstruction of human behavior and cultural patterns in a given context, including food/nutrition (i.e. type of subsistence and consumption patterns), trade, technology and raw resources (i.e. clothing, tools, etc.), work (i.e. hunting, transportation, agriculture, etc.) and the ratio of cost (i.e. energy output, monetary cost, quantity/quality produced, etc.) with that of the benefits reaped from the animal or faunal remains (Schlesinger 2008). The study of faunal remains often draws on cross-cultural ethnographic comparison. Such ethnographies can therefore serve as a type of analogical comparison to better understand the human behavioral patterns and processes that ultimately produced those evidences of how faunal remains form archaeological contexts (Read 1971). Furthermore, the analysis of faunal remains (i.e. the examination of butchery patterns and cutmarks) may provide evidence of cultural change interaction. This case study examines the
cultural exchange between different native Californian groups and Spanish colonists during the Mission era (1769-1833) in Alta California (St. Clair 2004; Graham 1998). Those changes introduced through cultural contact prompted the development of new social, political, and economical that dramatically affected the traditional subsistence patterns (Schlesinger 2008).

**General Approaches to Faunal Analysis**

Previous studies have examined various types of faunal remains, including mammalian, avian, and marine and offer methodologies, techniques, and examples for researchers. Each of these categories of faunal remains (mammalian, avian, and marine) is represented in the Royal Presidio of Monterey faunal collection, but has yet to be fully processed and analyzed; therefore, utilizing the different compilations of faunal studies will provide significant aid during the analysis of the Royal Presidio collection. Faunal analysis should begin with identification of the bone. However, the ability to accurately identify a bone depends on the researcher’s expertise with the cranial (skulls) and postcranial (skeleton, not including the skull) mammal remains understudy (Gilbert 1990). Skeletal identification can also be compared against any historical records or documents (i.e. pertaining to the Royal Presidio) which may verify the presence of a certain species and thus give the researcher an estimate of potential animals to anticipate in the faunal remains. Faunal identification can be based on size of specimen, selecting classifiable morphological characteristics, shapes, or markings, bone growth/fusion/proportion, and are all aspects for the researcher to bear in mind when cataloguing and interpreting faunal remains (Schlesinger 2008).

Essential faunal remains that can lead to the identification of the mammal include long bones (right/left), foot, and teeth such as the molars (Gilbert 1990). When examining faunal
remains, it is also important to note the presence of any abundance in the bones, as such could be an indication of a behavior, trade, preference, or any number of circumstances (Kausmally and Western 2005). The bones must be then further sorted into classifications of mammal, avian, and marine (Kausmally and Western 2005). Mammals can be identified by size; large bones (horse/cow), medium bones (sheep/goat/pig/dog) and small bones (rodent) (Kausmally and Western 2005). Bird bones, unlike mammalian bones, have hollow shafts for flight and the surface of bone is smoother and glossier than mammal bones (Kausmally and Western 2005); in addition, the bones of birds are significantly smaller than the majority of mammalian bones. The remains of fish are unique as they do not have long or limb bones and have continuous growth rather than fusion. Fish bones also have an appearance of layered sheets of paper. Otoliths (ear bones) are important in identifying fish bones as such indicates seasonal patterns (Kausmally and Western 2005).

After the initial organization and identification of the faunal collection, statistical manipulation of data becomes possible. Organizing the data in a quantitative method is essential to the research as it will ultimately affect the interpretation of the data (Grayson 1973). One method of organization includes the development of a table that presents the data in different identifiable components, such as including the following type of faunal remains: skull, mandible, vertebrae, pelvis, humerus, radius, ulna, scapula, metacarpals/carpals, femur, fibula, tibia, patella, metatarsals, talus, tarsals, phalanges, ribs, and teeth. From the identification of these remains, the tallying of the minimum number of individuals and the number of specimens becomes possible (Grayson 1973). Determining individuals and calculating relative meat weight

---

3 Identification of listed remains would be determined by comparison with a faunal collection, illustrative and photographic examples from literature.
is part of the quantification; the data is then at best is able to reflect ratios, percentages, and probabilities as real, solid numbers are not possible (Daly 1969).

Another element to integrate in the study of faunal remains includes the requisite for a standard terminology (apart from anatomical categorizations); however, such a standard does not yet exist in the field of zooarchaeology, and consequently without a common terminology in faunal analysis, issues and inconsistencies with definitions and specimen classifications arise when comparing faunal studies. This capstone study will follow R. L. Lyman’s terminology from his article, “Quantitative Units and Terminology in Zooarchaeology” (1995) to distinguish the different faunal remains; these basic terms include the following: specimen, element, and skeletal part. A specimen is a fragment of bone or tooth of which may not be identified to either taxon of the animal and/or the element. An element is a single complete bone or tooth of an animal; this complete bone is also referred to as a unit of a skeleton. A bone element or skeletal element refers to any fragmented or complete bone given the bone has enough reliability to establish the anatomical identity of the bone and/or taxon (i.e. species) represented by the element. Using these terms as described in the above can better serve faunal analysis.

Other factors to consider in faunal studies include those processes deemed conductive to the preservation of such collections in archaeological contexts. For example, Richard G. Klein and Kathryn Cruz-Uribe (1984) have studied zooarchaeological remains and have advanced a five stage process, beginning with life, death, and various elements of deposition. The first stage, or “life assemblage,” of the faunal assemblage is that prior to death or that of the live animal (Klein and Cruz-Uribe 1984: 3). The second stage, or “death assemblage,” concerns the death of the animal, and therefore that of an intact carcass (Klein and Cruz-Uribe 1984: 3). The third stage, or “deposited assemblage,” consists of the manner by which the body of the animal is
deposited (Klein and Cruz-Uribe 1984: 3); for example, how the carcass may have been separated through either natural causes (i.e. exposure to climate/weather, decomposition, root intrusions, encounters with other animals) or the result of human influence (i.e. butchering at a kill site and transportation) that would have altered and/or removed elements from the intact carcass. The fourth stage, or “fossil assemblage,” of a faunal assemblage includes the condition of the remains as excavated from the archaeological site (Klein and Cruz-Uribe 1984: 3). The fifth stage, or “sample assemblage,” includes the collection as recovered and analyzed (Klein and Cruz-Uribe 1984: 3).

This five-stage approach can also be understood in relation to that of John W. Fisher’s studies of faunal modifications. Fisher identifies three components: these include an actor, an effector, and causal agent or casual component (1995). The actor is the individual (human or nonhuman) that interacts with the bone by way of an object or natural feature (i.e. the effector); the effector is the object utilized or natural feature that has physical contact with the bone that ultimately produces the modification; and finally, the causal agent or causal component is the combination of the process and object (i.e. effector) that produces the modification on the bone (Fisher 1995). Such may then be applied to that of this study, in which the actor is human, and either of Native Californian or mestizo descent; the effector would thus be a cultural phenomena rather than natural, and thus produced by the given tool technology (whether such is metal or stone) that the actor utilizes in the butchering of the carcass, together forming the causal (agency) component, or the third stage of faunal processes as described by Klein and Cruz-Uribe (1984).
Research Focus on Faunal Remains

Given the focus of the research for the Royal Presidio of Monterey, the main research emphasis will be upon the faunal remains that display evidence of butchery (cultural) cutmarks and suggest butchery patterns in connection with social, cultural, and economic variation and status. Such research will then be compared to the studies of faunal remains from Mission San Juan Bautista by St. Clair and will merit more valuable information than merely identifying species based on the remains. Therefore, the extent of the research will be contained to those specified bones and bones that are fragmentary and/or do not exhibit indications of cultural modification will be excluded from the sample. In addition, this serves to narrow the analysis to that specific to cultural modifications. As noted by Catherine Read in her studies of animal bones and human behavior, the remains that have been butchered should exhibit various physical marks, such as cutmarks, breakages, fragmentations, and crushing (1971). In some instances, even the method of killing the animal can be determined or surmised by the physical state of the bone (Read 1971). Other data drawn from faunal remains is that related to food preparation.

When identifying a mark as a cutmark, it is important to first recognize if any repetitions or frequency of said marks occur on other bone specimens, and if such occurs at similar or identical locations on the bone (Lyman 1987). One such butchery pattern includes that of dismemberment or disarticulation, of which cutmarks frequently occur at the distal (lower) or proximal (upper) ends of the appendicular or limb bone of the animal; this process of cutting through the joints or junctures of articulation is considered one of the “easiest” ways to butcher an animal (Lyman 1987). Cut locations and orientations can be categorized into classes that serve certain functions (Lyman 1977). For example, separation of particular cuts, such as the scapula and the humerus, or the hip, and many others may each represent a class of cuts and the
type of food value an animal may be attributed with for the given population (i.e. at the Royal Presidio and San Juan Bautista) (Lyman 1977). Studying the faunal remains may also help to identify types of tools utilized to produce the cut marks (i.e. stone or lithic tool technology as opposed to metal tools, such as knives, cleavers, saws, etc.) which could be a reflection of the cultural institution (i.e. Spanish colonial and/or Native Californian) that manufactured those cuts (Lyman 1977).

Theoretical Frameworks of Cultural Contact Studies

Scholars including Kent Lightfoot, Robert Redfield, Edward Spicer, and Stephen Silliman have studied cultural contact or “cultural adjustment” (Spicer 2005) as a form of colonization and acculturation in different world regions. Cultural contact as discussed by these scholars includes contact between Europeans and indigenous populations resulting from colonialism.

Redfield (1936) defined acculturation as change in cultural patterns of one group(s) as the result of frequent first-hand contact with the different cultural patterns of another group(s) (i.e. a “cultural-carrier”); such changes in patterns occur between both cultural groups. Silliman (2005) suggested that “contact” or “cultural contact” is a broad term that refers to contact of peoples between different cultures over time, with period the indefinite (i.e. short term or long term); the nature of the contact is vast and includes a variety of conditions and situations (i.e. positive or negative historical event). However, Silliman distinguished between cultural contact and colonialism (2005). Colonialism is a process (as opposed to a single or series of events) by which a city- or nation-state purposefully exercises its control over that of an indigenous or native populous and its territories due to the colonialists’ perceptions of some form of inequality (i.e.
socially, politically, religiously, etc.) and/or conquest for desirable sources (i.e. through the exploitation of material or labor) as a motive (Silliman 2005).

Furthermore, the colonial institutions of the New World (i.e. Alta California) integrated various themes or dimensions that contributed to the extent of culture change and exchange. These dimensions of colonialism are identified and explained by Lightfoot as the result of his studies of the cross-cultural history of colonial California. Lightfoot compared both the Spanish colonization as well as the Russian colonization in northern California at Fort Ross, a nineteenth-century colony of the Russian-American Company. The Russian-American Company pursued the North Pacific fur trade, which impacted the diverse tribelet societies native to California, and in the case of the Russian impact, the effects of colonial processes influenced the Native Alaskans as well (Lightfoot 1994; 2005). Lightfoot categorizes the following seven themes of colonialism in Alta California: enculturation programs; native relocation programs; social mobility; labor practices; interethnic unions; demographic parameters; and the chronology of colonial encounters (2005).

The first dimension is the extent to which the dominating or colonist culture is successful in transforming the colonized or native culture to reflect that of the values of the dominating culture, or enculturation (Lightfoot 2005). Enculturation programs can be more easily identified with that of the Spanish missions because such was the direct intent of the Spanish colonial system; however, the extent of native enculturation into the Russian merchant colonies cannot be ignored despite the Russian emphasis on economic endeavors of the Native Californians rather than cultural or religious. The second dimension, native relocation programs, was utilized by the Franciscan missionaries to more efficiently integrate the native peoples into the mission system (Lightfoot 2005). The Russian colony was an example of indirect native relocation, but both
colonial institutions were involved in such. Relocation manifested in varied forms, ranging from persuasion, incentives and coercion to more forceful means. The third dimension, social mobility varied within the construct of the colonial hierarchy (Lightfoot 2005). Generally, in the mission system, the highest social class was that of the Spanish missionaries⁴, followed by the mestizo (mixed heritage) soldiers and settlers, and finally the native converts, or Indian neophytes (Lightfoot 2005). Lightfoot believed that those individuals in both the mission and mercantile settings whom manipulated their new cultural identity to best serve to the colonial objectives were more likely to have social mobility (2005). The fourth dimension that of labor practices, were an exploit of both the Spanish and Russian colonies that fluctuated in forms ranging from types of servitude to various compensated works (Lightfoot 2005). The fifth dimension, interethnic union, or marriage between natives and colonists was another prevalent element in the colonization process (Lightfoot 2005). Such relations not only produced new creole (mixed) populations, but also produced creole, or multi-cultural cultures a fact that conflicts with the notion that the colonies were purely of one ethnicity or another. The sixth dimension, demographic parameters addresses the negative effect upon native populations as a result of colonial encounters, specifically upon native health, abuse by settlers, and how each affected rates of mortality (Lightfoot 2005). The seventh dimension, chronology of colonial encounters, begins first with the second (the first “official” contact with native populations began in 1542 with that of the Spanish explorers, however such was not the first colonial establishment) initial contact in 1769 between native populations and the European colonists and how such as transformed over the succeeding colonized generations (Lightfoot 2005). The chronology continues on into the American period (beginning in the 1830s) when new cultural, social, political, and economic issues are introduced, thus additionally impacting the Native

⁴ However, it should be noted that the missionaries’ higher is not imply a higher status of wealth.
Californians. From these colonial processes emerge different forms of cultural contact or acculturation.

When referring to cultural change, there are different types and conditions under which acculturation may occur as a result of the colonial processes, such as those described in the above. Redfield identified several situations of cultural contact (1936). First is the imposition of one culture upon another whether such by force or voluntarily. A second situation is one in which there exists inequality between groups (although presumably any group that comes into contact with another will not believe the other to be of equal status due of ethnocentricity, this may be an oversight by Redfield); consequently, this inequality may lead to the political, social, and cultural dominance of one culture over another. Spicer also discussed types of cultural contact (1954). Directed culture contact, in this study, is between the Spanish colonial administration, missionaries of the Franciscan Order, and the Native Californian populations. Spicer identified three culture elements related to directed culture contact; these included economical and political organization (colonial administration) and ceremonial-religious systems (missionaries). Combined, these elements produced a change in the “cultural inventory” with respect to both material culture and nonmaterial culture include the following: relocation and resettlement, the introduction of new food staples, modification of political, social, and ceremonial attributes, introduction of new tool typologies, building construction.

The results of acculturation described are variable according to region and context. Spicer identified patterns of acculturation or contact adjustment, specifically referring to Spanish and Native American relations (1954). First, compartmentalization involves the acceptance of certain Spanish traits that were tangential to significant native cultural interests while rejecting the traits that may have altered the native cultural interests (Spicer 1954). This type of contact
adjustment entails minimal modification of the native culture. Second, fusion incorporates changes in many or all aspects of culture but in such a way that the new traits are not necessarily identifiable as either of Spanish or Native Californian origin (Spicer 1954); this type of cultural adjustment is more significant than a minimal modification of culture (Spicer 1954). A third type of pattern includes the integration of a few selected traits which results in significant reorientation of the culture. Such has also occurred without reorientation (Spicer 1954). Other types of contact acculturation include the complete rejection (i.e. due to oppression and/or non-acceptance) of the new culture as well as the complete assimilation of the new culture (Spicer 1954). Redfield also determined similar outcomes of acceptance and rejection but in addition an adaptation variable which he describes as the combination of the two cultures which according to the committee produces a new functional culture with little conflict (1936); however the view that this result is highly functional and conflict is less likely is contestable.

Lightfoot introduced another factor when studying cultural change, specifically in regards to archaeology; Lightfoot identified the tendency for the separation of prehistoric and historical archaeology (1995). Lightfoot suggested that culture studies should embody a holistic anthropological approach in the type of evidence and analysis of a given culture (1995); therefore, the study of prehistoric aspects (i.e. material evidence) of a given culture is necessary to include in addition to studying historic aspects of a culture in order establish a long-term study of a culture (Lightfoot 1994). One example of the distinction between prehistoric and historic archaeology lies with Spanish colonial California and the Franciscan missions. Lightfoot noted that excavation focuses on the mission quadrangle and associated structures (1995); thus, prehistoric studies of Native Californians outside of the mission system are handled differently in excavation and analysis. This aspect is essential as the study of faunal remains at the Royal
Presidio and Mission San Juan Bautista documents a cultural change from “prehistoric” through “historic” settings.

We use the cultural contact perspective (see Figure 7, below). This is similar to acculturation but rather than assume a replacement of one culture (i.e. the “recipient” or the Native Californian) with another (i.e. the “donor” or the Spanish), the cultural contact perspective suggests a two-way cultural change, or exchange. Graham (1998) suggests the idea of the “colonial package” in which foreign influence reshapes and reorganizes the native frame of mind, and way of life to best accommodate that of the outsider’s intentions. In regards to the mission system of California, Graham (1998) notes that the entire process does transform or restructure the native population, but not necessarily as the Spanish anticipated (i.e. the ideal Christian society). Rather, said processes produces a fusion that is neither purely nativistic nor purely triumphalist (1998). Such is important to recognize because Christianity is inherently a syncretic religion that has evolved into numerous forms; therefore, Graham establishes that there cannot be a “superior way” of Christianity because it is already a dynamic religion as it encompasses a history of inter-exchange or “cultural imagination” (1998).

Other approaches to cultural contact include “borrowing modification” during which the cultures are interchanging without one necessarily being dominated by the other. By contrast, the other second approach, “directed change” entails established dominance of one culture through military force, religion or ideology, etcetera. Such relates more to characteristics of colonialism; therefore, colonialism may in fact be a type of cultural contact but cultural contact is not necessarily colonialism. We intend to use the theoretical framework of cultural exchange and interaction of the various observations from the cultural contact scholars to interpret the faunal remains with the intentions of identifying markers of cultural change (i.e. type of butchery cuts
and marks) in the subsistence patterns of the Costanoan at the Royal Presidio and San Juan Bautista during the mission period.

During the process of acculturation, Redfield noted that certain aspects may be selected (i.e. the establishment of new standards, such as what traits are acceptable and what traits are not) (1936). These traits may be met with resistance or conflict or may be accepted by the receiving group if the group finds such to be advantageous (Redfield 1936). Time is another determining factor of acculturation. As time progresses, cultural traits originally introduced and integrated into the group may change or adjust (Redfield 1936). This change reflects the psychological mechanisms of acculturation; where the receiving group and/or individuals may acquiesce while others may continue to reject the new cultural aspects (Redfield 1936). The cultural traits used are those represented by the butchery marks on the faunal remains deemed part of the “cultural inventory” that would have accumulated as the length of contact persisted as described by Spicer (1954).
Figure 7: This Venn diagram has been recreated from the Robert Hoover’s model of acculturation in Spanish colonialism (1992). The circle on the left constitutes those Native traditions during the pre-contact of Spanish colonialism while the circle on the right constitutes those Iberian or Spanish traditions introduced to those pre-contact traditions of the Native Californians. The overlapping arcs of the two circles represent those areas of cultural contact in Alta California between said traditions. Notable to this study are those areas of tool technologies and subsistence patterns introduced to those Native Californians.

Methodology

General Approach

The faunal collection from the Royal Presidio of Monterey was excavated during the field seasons spanning 2006 through 2008 by Dr. Ruben Mendoza and the students of the CSU
Monterey Bay Institute for Archaeological Science, Technology and Visualization. Such archaeological investigations served to address the architectural, cultural, and historical objectives of the Royal Presidio Chapel Conservation Project (Mendoza 2012). The faunal specimens, in addition to significant collections of material culture from the Mission or Colonial (ca. 1770-1835), Mexican (ca. 1824-1848), and early American (ca. 1848-1865) eras, were recovered during the trenching operation spanning thirty-one, 22’ to 24’ foot long trenches that ran the perimeter of the Royal Presidio Chapel of 1794 (Mendoza 2012). While the entirety of the faunal collection processed and catalogued by the project team into an online database for the Institute for Archaeological Science, Technology, and Visualization of CSUMB, this capstone project constitutes the first complete analysis of butchered faunal remains recovered from the Royal Presidio Chapel by the Institute during the 2006-2008 field seasons.

Collyer and I have used qualitative and quantitative methodologies to organize and assess this zooarchaeological data. The osteological literature on mammal, avian, and fish faunal remains served as models of categorization and analysis for those zooarchaeological remains under study. Most researchers who studied faunal remains emphasize the importance of quantitative methodologies to interpret the evidence; however, the differing quantitative methods have led to disagreements among these researchers and created issues of accuracy, reliability, and ultimately are here deemed circumstantial to the given faunal collection. As such, is not to use those quantitative techniques discussed and utilized by other scholars, as this study concentrates on the qualitative interpretation of cultural modifications of the bones. Nevertheless, quantitative methodologies will not be disregarded in this study, but will not serve as a primary medium of interpretation as it has for other faunal studies. Furthermore, researchers of zooarchaeological data also emphasize the need to identify those faunal elements, both
taxonomically (i.e. species) and anatomically. However, given the fragmentary and incomplete nature of the majority of the faunal elements identified with cutmarks, such identifications are not critical to this capstone study. We fully recognize that our limited identification is atypical in regards to the majority of other faunal studies cited. Therefore, this research has also been combined with archival research significant to the Spanish colonization of California to aid in the establishment of a social, cultural, and economic history relevant to the Colonial era at the Presidio of Monterey and San Juan Bautista. Furthermore, the integration of any additional comparative data from other resources or consultation of persons with expertise will supplement the research.

The initial stages of organizing the evidence included a preliminary examination of the entire faunal collection of the Royal Presidio. During this first examination, Collyer and I reviewed the individual bones from the collection to determine which faunal specimens to select as research subjects that were significant to our objectives. After a preliminary assessment, and sorting, Collyer and I found that it was necessary to further refine the collection and sorting to more closely coincide with project objectives, but also to one that was more controlled with respect to the duration within which the research was to be conducted. In addition, not every specimen is preserved in a manner that is practical to either the research or our level of faunal expertise. Factors considered to limit our selection included the following: 1) evidence of cutmarks, or what we perceived to be a cultural modification or trait; 2) we also took into consideration the size and type (i.e. skeletal element) of the bone; 3) therefore, as a result of size, all fragmentary bones were discarded; 4) burnt bone fragments were also discarded and were not inspected but are still noted and documented. After these elements of organization were
integrated into a more refined faunal collection, Collyer and I commenced with our research in a more in-depth approach, focusing on the bones with what we have identified as cutmarks.

Together we then set upon the organization of the remains into separate categories based on distinctive characteristics of the cutmarks. These categorizations were in part based on John W. Fisher’s article, “Bone Surface Modifications in Zooarchaeology” (1995); Fisher studies the cutmarks on faunal remains produced by stone tools (i.e. human cultural modification) as well as marks on the bones from nonhuman processes (i.e. modifications that result from exposures to other animals, the natural environment and climate). From comparisons with Fisher’s documented cutmarks, we have denoted and tabulated the following general cutmark morphological categories: chopmark, fine, dismemberment, scrapemark, clean cut and/or break, clean cut with other marking, and other marks, such as fillet markings and evidence of intentional breakage. We will further document the evidence through various mediums, such as illustrations, photography, and possibly a specialty graphical or image-analysis software (GIS) program as introduced in the article, “The Analysis of Cutmarks on Archaeofauna: A Review and Critique of Quantification Procedures, and a New Image-Analysis GIS Approach” would which would aid in the interpretation and presentation of the evidence (Abe 2002). From such a visual documentation, Collyer and I can then better classify and represent the faunal remains.

*Studies on the Identification of Cultural Modifications on Faunal Remains*

The studies of cutmarks are valuable because in cutmark morphology, the mark may serve as an indicator of the tool’s cutting edge, the angle from which the mark was incised, and the force of the cut (Fisher 1995). For example, lithic or stone tool cutmarks that were produced by a sawing motion are likely to have short and frequent multiple striations which are closely
spaced parallel or near parallel marks. Furthermore, persistent cutting or sawing at a particular location is likely to incur a deep incision (Fisher 1995). Multiple short, nearly parallel striations of approximately equal width (same tool, variation attributed to different cutting strokes) and with that of a V-shaped cross section may be associated with cultural modification (Fisher 1995). Through the study of faunal remains, researchers may identify evidence that indicates meat-eating, butchery patterns, and other uses for animal carcasses through the types of markings on the left by lithic (stone tool) technology. Fisher’s studies and categorizations of lithic markings on faunal remains have aided this study in our efforts to identify cultural modifications or markings on faunal remains from the Royal Presidio of Monterey.

Fisher arranges seven stone tool marks in his research and provides visual images by which Collyer and I compared our faunal collection. One type of mark, “shoulder effects,” consists of short marks and has markings that indicate there was contact between bone and “shoulder” of tool. These lines can parallel or diverge from the principle striation (Fisher 1995). A second type of mark, “barbs,” consists of a striation, or set of closely spaced parallel striations, that diverge at an acute angle from the end of an associated striation; these may occur at the beginning or ending extremity of a cutmark (Fisher 1995). A third type, consists of splitting, in which a mark is a divergent line or lines from main mark (Fisher 1995). A fourth type, scrapemarks (see Figure 8 below) includes a set of multiple, closely spaced and parallel striations, elongate and linear, narrow, may result from the removal of periosteum (the membrane layer on bone surface) from bone and prepares bone for breakage or bone marrow removal (Fisher 1995). A fifth type, chopmarks (see Figure 9, below), includes broad, relatively short, linear depressions, that may consist of the V-shape; such may vary depending on when the marks were made, such as upon a whole carcass that was dried out or when the bones were later
disarticulated. Typically cutmarks serve as part of the removal of muscle attachments on the proximal and distal ends of humerus and femur bones of an animal (Fisher 1995). A sixth type, conchoidal flake scars and bone flakes, are produced through the usage of a hammerstone and strong force; the result is a smooth, concave surface which is typically laterally expanded and has a crescentic or semi-circular edge (Fisher 1995). Furthermore, bones with flake scars on opposing sides may be an indicator that the bone was on a stone anvil when struck (Fisher 1995). A seventh type includes percussion pits and percussion striations; these result in small circular depressions or pits and at the striking point, generally consist of microstriations located within or from the pit. It is also possible that rockfall could produce similar marks on bones but the anatomical location of the marks should be distinguishable (Fisher 1995).

**Examples of Lithic Tool Cutmarks from Fisher (1995)**

![Figure 8: Example of scrapemark from a lithic tool on a bison thoracic vertebra.](image)
Other types of marks Fisher identified include the following: 1) incipient fracture cracks which may extend partly or completely across the bone specimen; 2) crushing (i.e. inward crushing, may be carnivore induced perforations or percussion pits); 3) punctures, of which may occur as circular or oval penetrations into bone from some form of stabbing of a pointed object such as a projectile puncture; 4) gouge marks; polish (smoothing and rounding on edges); 5) gloss or sheen without the usage of a microscope; 6) possible through boiling; abrasion lacks sheen; 7) nonhuman-water, wind, other form of movement against the bone) (Fisher 1995).
In faunal studies, caution must be taken into consideration when identifying modifications on the remains. Fisher also arranged examples of bone modifications produced by nonhuman processes (1995). These include the following:

1) weathering, may produce cracking, splitting, decomposition, etc. erosion (also possible signs of through the digestion system by an animal);
2) trampling, which produces patterns of striations, polish, flake scars;
3) root etching, which produces shallow lines that are wavy and U-shaped;
4) and, toothmarks or gnawing, which may be from carnivores or other animals, such as rodents, which produces shallow furrows or flake scars (Fisher 1995).

Experimental Archaeology: Recreating Spanish Colonial Butchery

Another method Collyer and I explored included an experimental archaeology component. This experiment sought to simulate the butchery cutmarks we have observed on the faunal remains from the Royal Presidio collection. Essential to this experiment were fresh cuts of beef or pork with the skeletal elements intact, including that of a rib rack and, sections of a limb or shank. We should note that both of these animals would be accurate examples of food sources for the residential soldiers and Native Californian laborers at the Presidio of Monterey as well as at Mission San Juan Bautista. With the aid of a blacksmith who specializes in the study and practice of Spanish colonial and Hispanic iron-forging techniques, John Grafton of the San Juan Bautista/Prunedale area, recreated Mission or Colonial era metal tools, including knives/cleavers, machetes, saws, axes, and other tools. Collyer and I also used stone tools, such as those produced through flintknapping. 5

---

5 The process of creating stone tools.
We fully recorded these experiments through videography and photography provided and documented by Dr. Mendoza and fellow archaeology student, Jewel Gentry. With different tool technologies and techniques at our disposal, we then compared results with those specimens from the Royal Presidio of Monterey faunal collection. If the Royal Presidio of Monterey cutmarks reproduced by the metal and lithic tools used resemble those on Royal Presidio of Motneray faunal specimens, we determined to interpret the original butchery traditions or cultural modification and identify those tools that produced the cutmarks.  

Findings

The examination of individual skeletal elements from the faunal collection of the Royal Presidio of Monterey was completed, produced, and thereby produced usable data. From the examination of the faunal assemblages as described in the following section, Collyer and I identified a distinct sample (see Figures 10, 11, 12, and 13, below). The tabled data and charts represent the faunal sample in raw quantitative form. Furthermore, with these charts, Collyer and I were able to interpret the cultural significance of the evidence.

Identified Skeletal Elements (see below)

---

6 Furthermore, we applied to the CSUMB Alumni Association Capstone Grant Program in order to receive reimbursement for the purchase the necessary meat (beef and/or pork), iron materials, lithic resources, and other related supplies for this experiment.
Figure 10: This chart depicts the frequency of those identified and unidentified skeletal elements with cutmarks or modifications recovered from the Royal Presidio of Monterey. To view the total individual skeletal elements from the represented trenches, see Appendix I: Index of Faunal Assemblages by Trench for the total sample. Chart prepared by Jennifer A. Lucido, 2012.

As represented in Figure 10 (above), of the identified skeletal elements, ribs constitute the majority or 52% of those culturally modified faunal remains of the collection from the Presidio of Monterey. Additionally, Figure 11 (below) visually represents those identified skeletal elements of Figure 10 in articulation, or complete skeletal relation. Such is most likely even greater than the percentage represented in Figure 10 given that there were a number of skeletal elements that due to their fragmentation and/or size, could not be distinguished from ribs or thoracic vertebrae. The second most frequently identified skeletal elements from the collection included those appendicular or limb bones at 21%. It should be noted that although femur,
humerus, and metacarpal bones are technically limb bones, those faunal remains collectively categorized as such appendicular bones could not be identified into specific anatomical skeletal elements that support the forelimbs and hindlimbs of a given mammal (i.e. femur, humerus, tibia, etc).

**Figure 11:** This illustration and diagram of cow (*Bos taurus*) cranial and postcranial skeleton depicts those culturally modified skeletal remains in anatomical articulation as identified in Figure 10. Additionally, the identifying colorization in the above correspond with those skeletal colors utilized in Figure 10. Illustration by Michael Courtureau, 1996, colorization and labels added by author. 

---

7 Illustration by Michel Courtureau, 1996. “Collaborate website of Archaeozoology.”
Figure 12: This pie chart illustrates the frequency and variety of modifications identified as cutmarks from the sample faunal collection. See Appendix I: Index of Faunal Assemblages by Trench for the total sample. Chart prepared by Jennifer A. Lucido, 2012.

As represented in Figure 12 (above), of the identified cutmark types, the chopmark patterns constitute the largest frequency (33%) of those culturally modified faunal remains of the collection from the Presidio of Monterey. Fine cutmark patterns constitute 30%, while the remaining cutmark typologies include those of dismemberment, scrapemark, clean cut or choppings, breakages, and the combination of these cutmark elements.
Identified Skeletal Elements and Cutmark Typology

**Figure 13:** This graph illustrates the combination of the identified skeletal elements and the associated cutmark typology correlated with each element. The numbers on the y-axis represent a raw count. Chart prepared by David L. Collyer III and Jennifer A. Lucido, 2012.

As represented in Figure 13 (above), this bar chart represents the combination of the frequency of preliminary identified cutmark types with the skeletal elements described in Figure 8 of those culturally modified faunal remains of the collection from the Presidio of Monterey.
The numbers on the y-axis represent a raw count based on those the sample (see Appendix I: Index of Faunal Assemblages by Trench for the complete tabulation). As noted before, both rib bone elements and the types of cultural modifications or chopmarks and fine markings are most significant. Furthermore, ribs and the aforementioned types of cutmarks together constitute the majority of the faunal collection under study. Another observation that can be derived from Figure (above) includes that of the presence of multiple cutmark typologies on the other skeletal elements, such as that of the limb and humerus bones.

*Faunal Assemblage by Trench*

Of the thirty-one trenches excavated during the Phase 3 investigations of the archaeological monitoring undertaken at the Royal Presidio of Monterey, Trenches 1 through 16, 18, 21, 23 through 27, and 30 (total of twenty-three trenches) account for the majority of those faunal assemblages examined in this capstone (see Figure 6, above). Of these trenches, those that yielded the highest number of butchered faunal remains include the following (in order of higher to lower assemblages):

1) Trench 3a (nine skeletal elements) of which extends from Trench 3 near the vicinity of the Terrace 1 feature and associated 1807 midden, east of the East Transept of the Chapel of 1794;

2) Trench 6 (eight skeletal elements) of parallels the west wall of the West Transept; Trench 26 (eight skeletal elements) of which is east of the East Transept and parallels the Rectory apartment;

3) Trench 4a-b (six skeletal elements) of which parallels the southern walls of the Apse and Modern Sacristy, trending east to west;
4) Trench 9 (six skeletal elements) of which parallels the north wall of the façade of the Chapel of 1794;

5) and finally, Trench 8a/c (five skeletal elements) of which parallels the western wall of the nave; furthermore, from these six trenches alone, approximately one half of the entire faunal assemblage in this study was recovered, while the remaining seventeen trenches constitute the second half of the collection. Within these specified trenches, of the total 42 skeletal elements recovered, ribs constituted over three-quarters of the assemblage (76%), appendicular or limb bones represented 17%, and the remaining bones represented only 7%.

Both Trenches 3a and 4a-b were identified with that of a trash midden and combination of soil backfill from the 1940s Rectory (Mendoza 2012). In Trench 6, cattle bone and a variety of earthenwares were significant recoveries, of which are identified with a midden associated with the construction of the Chapel of 1794 (Mendoza 2012). Trench 8a was identified in association with the adobe Sacristy of 1811 (Mendoza 2012); Trench 8c recovered the north wall of the arcade corridor of the Soldiers’ Barracks of 1778-79 (Mendoza 2012). And finally, Trench 9 produced those architectural indications for the altar 1770, but also that of marine shell and mollusk remains from a dark grey to black midden associated with the Chapel of 1770 (Mendoza 2012).

*Experimental Archaeology: Procedures and Results*

As described in the aforementioned methodology section, this experimental archaeology component sought the recreation of those Spanish colonial cultural modifications including those
chopmarks, saw marks, scrapes, dismemberment, and other such cutmark patterns on the faunal remains recovered from the Royal Presidio of Monterey collection. This experiment was conducted in the CSUMB Archaeology Laboratory. The experiment was a collaborative effort. Collyer served as the experimental butcher, Dr. Mendoza filmed and photographed the process assisted by Jewel Gentry, while this investigator maintained notes, and systemized and catalogued the specimens. For the photographic documentation of this process and the results, see Appendix III: Experimental Spanish Colonial Butchery.

The beef cut under study were purchased from the Safeway grocery store, and totaled nine specimens. The meat selection included the following: 1) beef back ribs with a total of five ribs; 2) beef soup bones (typically part that of the shank or limb) with a total of three; and 3) a single pork shoulder. These were deemed appropriate samples of meat, particularly the beef back ribs. Ribs were represented majority of those faunal remains from the historic collection.

In this experiment, there were three cutting implements: (A) the first, a Hispanic colonial style machete with a flared-edge brought from Baja California by John Grafton (see Figure 14, below); Mr. Grafton also provided a wooden block or board on which to chop the meat; (B) the second, a colonial-type cleaver/machete with a trapezoid-shaped straight-edge provided by Dr. Mendoza from Mission San Juan Bautista (see Figure 14, below); and (C), the third, obsidian or flint un-retouched flakes (five total were used) created through the process of flintknapping, also provided by Dr. Mendoza (see Figure 15, below); these obsidian cores originate from Lassen County, California.

---

8 A white screen and flat surface in addition to backdrop studio lights were used to create a professional setting.
Figure 14: The cleaver/machete (B) faces right. The Baja Californian machete (A) faces right. Note the difference in shape of the blades of these knives: B has a straight edge with a trapezoid shape while A has a flared shaped edge. Photo by Jewel S. Gentry.

Figure 15: This obsidian unretouched flake (C) is one of five used during the experiment. The function of this flake served primarily as a scraper. Photo by Jennifer A. Lucido.
The experiment proceeded in the following manner. The Hispanic colonial machete, or A was first paired with cutting the ribs, or 1 (as denoted in bold font in the above descriptions), thereby constituting A1; such grouping represented those cutmarks produced on three ribs, Rib 1, Rib 2, and Rib 5. This pairing of cutting implement and specific meat type continued in this pattern; for example, C3, or, the combination of an obsidian flake cutting the pork shoulder. As a result, each type of meat underwent the butchery process with the three separate cutting implements and was then bagged and tagged (labeled) with the respective letter-numerical denomination and specific number of bone element. Having successfully created various cutmarks using the different tool technologies, all specimens were then boiled in separate vats of water with two to three cups of bleach each in order to aid in the sloughing or removal of the excess meat, fat, periosteum, and other organic matter from the skeletal elements. Following this procedure after soaking overnight, the bones were boiled again and then rinsed with lukewarm water as to avoid flaking; this bone de-fleshing technique is necessary to prevent the creation of additional striations or markings (i.e. from metal tools) on the faunal remains that were not produced during the experiment. These “bare bones” ultimately constitute the comparative analysis with the faunal remains from the Presidio and Mission San Juan Bautista collections.

The results of these experimental cultural modifications or butchery pattern cutmarks on the skeletal elements (rib, soup bone, and pork shoulder) are listed and described in the below section, in the order of cutting implement, A, B, and C (for more detailed reference of the coding used below, see the specific designations as denoted in bold font in the above descriptions):

**A1 Rib 1:** Efforts to produce chopmarks and saw marks on Rib 1 with this machete were successful; Collyer was able to do such with easy to moderate ability. Chopmarks are evident, in

---

9 This process was as prescribed by Emily Nisbet (graphic artist and faunal remains enthusiast).
addition to those replicated sawing marks, observed in the middle of Rib, identified by the repetitive and closely-spaced striations. In addition, fine marks are present toward the end of Rib 1. (see Figure 16, below).

A1 Rib 2: The meat on Rib 2 cut away relatively easily and produced straight, clean cuts. However, only a single marking was identified on this bone, of which appeared to be vertical chopmark.

A1 Rib 5: Despite the efforts documented to replicate cutmarks on Rib 5, no such evidence of cutmarks could be discerned on this bone. However, it should be noted that in this particular instance, efforts were made to reproduce those fine cutmarks observed in the faunal collection of the Royal Presidio of Monterey. Such was enacted through delicate application of pressure when cutting and also done so at a diagonal angle; furthermore, Collyer also experienced some resistance when cutting Rib 5.

A2 Soup Bone 1: The issue noted in A1 Rib 5 occurred a second time with Soup Bone 1. However, during the attempts to chop this particular bone, although the cutting implement was able to cut through the meat, it was barely able to permeate through to the bone. When Collyer attempted to saw through Soup Bone 1, he found such relatively easy, yet the shallow markings were left upon the high fat content on this bone rather than actual skeletal element.

A3: Collyer was found some resistance with cutting the pork shoulder, but found that the machete was able to cut fat more easily. However, as the machete could not penetrate through the initial layer of pig skin, Collyer attempted to saw through the skin in order to expose the meat. Once the exposure of meat was achieved, Collyer began lengthwise trimming and “sliding” meat away from the core of the shoulder. This allowed better access to cutting through the meat to the bone; in addition, dismemberment at the joint was enacted through chopping and
sawing of which proved the most challenging aspect in the entire experimental butchery process. Multiple horizontal striations identified at the end of this bone are associated with this dismemberment technique (see Figure 21a, below).

**B1 Rib 3:** With this cutting implement (cleaver/machete), such was able to cut through to the bone but did not easily separate meat from bone, even when scraping vertically and sawing were tested. Chopping with this implement on Rib 3 was found particularly challenging as Collyer met resistance and applied more pressure with the cleaver, and ultimately was unsuccessful. Furthermore, the cleaver was damaged during its first usage in the experiment. However, multiple chop marks were identified on Rib 3, in addition to saw marks on the reverse. (see Figure 17, below).

**B2 Soup Bone 2:** Overall, issues observed with the low quality cleaver appeared again with the cutting of Soup Bone 2. However, it should be noted that through chopping, a significant cutmark of a V-shaped section was removed from Soup Bone 2 (see Figure 18, below).

**B3:** When the chopping procedure was attempted on the pork shoulder with the cleaver, such was unsuccessful as it barely marked the surface of the pig skin, as was the issue with A3. However, once there was access to the meat, the cleaver was able to slice through although no marks on the bone itself were identified as produced by this cutting implement (see Figure 21b, below).

**C1 Rib 4:** With the obsidian flake, the meat was quickly separated and produced clean slices of meat. However, additional debitage from the flake became indebted into meat during this process. The ability to saw and scrape the meat was also successful but relatively slow
because the flake had dulled after the initial cutting. Ultimately, the obsidian flake produced a single very fine mark on Rib 4 and one flake scar was noted as well (see Figure 16, below).

**C2 Soup Bone 3:** In this instance, the flake used for Soup Bone 3 retained its sharp edge longer than the obsidian flake in **C1 Rib 4**. Again, the repetition of ability to cut and separate meat was observed except when the shape and density of certain anatomical elements of Soup Bone 3 affected such. In addition, flaking occurred during this process and contaminated the meat. Notable to Soup Bone 3 is the presence of a chopmark as well as those paralleled fine marks observed **C1 Rib 4**. Also of interest was the presence of a finely V-shaped cutmark produced by the obsidian flake (see Figure 19, below).

**C3:** The obsidian flake was again successful in smoothly cutting through the pork shoulder, although as observed with the other cutting implements, penetrating through the pig skin was difficult. However, when the layer of skin was pulled taut, and heavy pressure applied to the flake, the obsidian could more deeply cut. Again, as in all cases when this type of cutting implement was used, flake debitage tainted the meat (see Figure 21c, below).

Ultimately, in Collyer’s experience as the experimental butcher, he found that **A**, or the curved machete from Baja California, was the most effective and easiest cutting implement to use. **C**, or the various obsidian flakes, Collyer ranked as second to that of the Baja California machete, as it too was highly effective in cutting meat. However, the obsidian flake itself was difficult to handle and dulled quickly after being used. And finally, **B**, the cleaver Collyer found the least effective of the three cutting implements. The cleaver was often unsuccessful in its function although did produce severe damage in the case of **B2 Soup Bone 2**. Also of note, the blade of this implement also splintered after usage.
Discussion of Findings

The following dialogue discusses and compares the findings and analyses of faunal assemblages, butchery patterns, and associated material cultures recovered from Spanish colonial sites in Alta California with that of the Royal Presidio of Monterey. Such will also discuss those findings of the recreated butchery cutmarks from the experimental archaeology component of this capstone project. In addition, the comparison of butchery patterns from these Spanish colonial sites aid in the identification of certain types of cutmarks and tool technologies from the Royal Presidio of Monterey. Such identifications or correlations could then also attribute to the producers that created the cutting implements and/or cutmarks. These comparative sites that will aid in this analysis and discussion include the thesis study of Mission San Juan Bautista by St. Clair, the Ontiveros Adobe (built during the end of the Mission era, beginning of the Mexican era), El Presidio de San Francisco, and Rancho Petaluma of Mariano Guadalupe Vallejo.

Comparative Analysis: Mission San Juan Bautista

From St. Clair’s studies and analyses of the faunal assemblages from Mission San Juan Bautista, St. Clair determined the minimum number of individuals and numbers of individual specimens per deposit specimens examined were recovered from archaeological excavations of the mission courtyard and Neophyte Housing Area. And like those faunal remains recovered from the Presidio of Monterey, the majority of those bones were highly fragmented, and this hindered the formal identification of those skeletal elements. However, of those faunal remains that identified, St. Clair learned that the mission courtyard yielded primarily domestic cattle bones (5,409 specimens) as did the neophyte housing (2,329 specimens). Evidence of shellfish were also recovered (2004). However, it should be noted that, Collyer and I did not quantify the
Lucido 56

entire faunal collection as St. Clair because our focus was with those culturally modified faunal remains. Therefore, with respect to the mission courtyard excavations, St. Clair was able to conclude that domestic cattle were a primary source of subsistence at the mission while sheep, goat, and pig represented a significantly smaller quantity in the archaeological deposits despite high counts in the documentary records of the Mission (2004). Moreover, St. Clair recognized that the cattle served not only as a food source, livestock also worked as draft animals, transport, and providing raw materials such as fleece, hide, and tallow, etc (2004).

Furthermore, examination of the faunal assemblages from the Mission San Juan Bautista Neophyte Housing Area produced different results than that of the mission courtyard. St. Clair found that in this area, the archaeological record suggests a higher representation of sheep and/or goat and perhaps also deer rather than dependence upon cattle as in the mission courtyard (2004). In addition, there was a noteworthy presence of shellfish remains recovered from the Neophyte Housing Area. Ultimately, based on these findings, St. Clair concluded that the emphasis on sheep and/or goat faunal assemblages represented a more acculturated state in regards to consumption patterns of those Native Californians whom resided in said housing area. Ultimately, St. Clair concluded that those dietary patterns represented in the mission courtyard deposits were similar if not identical to those of the neophyte housing area. Apart from the observations of different species types (i.e. deer), butchery patterns, and other modifications of the faunal remains St. Clair was unable, however, to distinguish any further cultural markers from cutmarks of the Ohlone Mutsun Native Californians at Mission San Juan Bautista.

Findings of Butchery Patterns at Other Spanish Colonial Sites in Alta California
Excavations from the Ontiveros Adobe have recovered significant faunal remains of which have since been studied and analyzed by Sherri Gust (1991). During this investigation, Gust also gathered primary sources to establish a portrayal of “Californio-style” meat processing and cuts of meat. From these sources, Gust was able to determine the following butchery practices. One of the first steps in butchering is the removal of the fresada, which is the portion covering the ribs (Gust 1991). Another popular way to eat and transport meat was to cut the meat into strips about an inch in diameter, one to three feet long which could then dry out into beef jerky or carne seca (literally dry meat) (Gust 1991). Furthermore, the carne seca could be pulverized into a powder with a pestle and mortar and mixed with other spices and/or liquids to create other food dishes (Gust 1991). Among one of these sources, there was a reference (perhaps from an American settler) as to how a Spanish or Mexican butcher does not know how to properly cut pieces of beef, that such a butcher strips meat from the bone as he would remove the skin from the carcass (Gust 1991):

> It would seem a small affair, at first sight, to get a piece of beef of any size, but you will learn to the contrary if you go to a Spanish or Mexican butcher. He knows nothing about side pieces or plate pieces or quarters. He goes in for stripping the meat off the bones just as he does the skin, by cutting and tearing, making the whole into shreds and patches (Gust 1991:452).

In addition, Gust addresses the types of tools utilized during the butchery process. For the Ontiveros adobe of California, the only tools associated with the cutmarks were those of a metal knife and an ax. A knife cutmark was represented by scores, or nicks and was sometimes used like a saw (Gust 1991). An ax cut mark was represented by scores, cuts and cuts-to-breaks; axes
likely had a flared shape in the iron, with a wooden handle. It is also likely that stone tools were utilized as well (Gust 1991).

Furthermore, Gust discussed an archaeological feature associated with the Ontiveros Adobe that may represent a potential *mantanza* deposit; a *mantanza* is a site in which there was an important annual slaughter of cattle during the summer to acquire hides and tallow for trading purposes (1991). Gust anticipated that such a site would entail a large number of bovid skeletal elements and that the butchery marks would constitute a pattern because the cattle would have all been slaughtered for the single purpose of acquiring hides and tallow (1991). Alternative slaughter sites, such as serving those missions, consisted of slaughtering twenty to thirty cattle of a given slaughter (Gust 1991).

Excavation of El Presidio de San Francisco (established in 1776) began in 1993 (Blind 2004). Within the archaeological record, faunal assemblages were recovered and served the investigators of this site as an indicator of dietary evidence. The faunal remains recovered reflected that the soldiers and settlers had a meat-based diet, primarily from cattle (Blind 2004). Also observed in the faunal remains were fowl and chicken remains of which also represent from the presidio diet. From these remains, in addition to diet any patterns, butchery patterns have also been identified. Notable in this faunal collection from the presidio is the identification of the “Californio” style butchery pattern, such as in the case of those faunal assemblages recovered from the Ontiveros Adobe. The Californio style consists of marks that would have been made from straight-edged knives and cleavers to separate the meat from the bone (Blind 2004). Also of significance to this excavation is the presence of wild land animals, such as deer and rabbit, of which were also part of the diet. Interesting, the quantity of these remains was also highly
represented, thus suggesting that the midden(s) from which the faunal remains were uncovered may correspond to an initial settling period of the Presidio of San Francisco (Blind 2004).

At Rancho Petaluma, a northern California ranch establishment, principle investigator Stephen Silliman conducted archaeological excavations with the intentions of identifying residential features and material culture associated with those Native Californian laborers (2004). While the investigations did not recover residential features as Silliman anticipated, he did recover a variety of material culture suggestive of native residential and domestic use, notably that of stone tools (obsidian, chert, groundstones, pestles, manos, mortars), glass and shell beads, culturally modified (incised) bones and glass, mass-produced ceramics, nails and other metal objects, etc (2004). Significant is the identification of these lithic tools in association with metal objects. Said tools could represent the lack of access or availability to those Spanish colonial metal tools, therefore constituting the necessity of stone tools of the native tradition. Silliman addresses the misconception of total abandonment of native stone tool technological traditions with the recovery of lithic materials in historical settings during the Contact era.

Additionally, stone tool evidence, significantly that of obsidian materials, are found in various colonial sites of California, including those of the Franciscan missions, Spanish and Mexican ranchos, and the Russian trade colonies. Silliman suggests that such could represent an option or preference for labor activities, as well as a political, social or cultural statement about identity or gender (Silliman 2004: 102). Additional material culture includes those food remains, including faunal and plant (i.e. seeds) remains, of which essential to survival in daily life and contributes the material culture. Silliman argues that such can have political connotations, such as a type of control mechanism or societal distinction between laborers and their employers.
Lucido 60

(2004). Most significant in this category includes that of cattle remains in the laborers’ diet, of which corresponds with those findings from the sites described above.

Mission Era Butchery Technology

In addition to the introduction of cattle to Alta California, ranching and butchery technology accompanied the Spanish colonists. In ranching, a hocking knife, desjarretadera (a crescent-shaped steel blade, which can be either concave or convex) was mounted on a four to five foot pole to use while riding on horseback, which was then used sever the hamstring on an animal (Simmons and Turley 1980: 88), preventing the animal from mobility and therefore could be more easily slaughtered for butchery, which typically took place on the ground where the cattle died (Simmons and Turley 1980). In addition, cattle were stretched with ropes onto large wooden racks for transportation (St. Clair 2004). Axes were used to divide the carcass and break appendicular bones above or below the joints as well at the center of the shaft of the bone (St. Clair 2004). Knives with wooden handles were then used to cut the tendons and muscle attached to the bones (St. Clair 2004). Ribs were often cut multiple times which resulted in great fragmentation and shattered bones (St. Clair 2004). Other knives used in the butchery process include beam knives or pelador para gamuza which tanners used to scrape hides (Simmons and Turley 1980).

In the home, there were a variety of functional metal tool technology of which could have left modifications on faunal remains; the following examples are specific to kitchen and food preparation. Meat hooks, or garabato de carnicero would hang from a ceiling; these hooks typically had four-pronged hooks by which to suspend meat or carcasses (Simmons and Turley 1980). Knives in home included primarily that of small kitchen knives, or cuchillos carnizeros
for food preparation and consumption, and that of the peasant knife or *cuchillo de cintura* as it could be conveniently transported in a belt or sash, also known as *belduque* (Simmons and Turley 1980); other common knives were that of the *machete*, of which was originally meant to serve as a weapon but was discovered to have multi-purposeful functions apart from self-defense (Simmons and Turley 1980).

As discussed in the above, Spanish colonial axes were used to dismember and disarticulate those appendicular or limb bones from the whole carcass; such butchery practice also extended to the breakage of the middle or center shaft of the appendicular bone (St. Clair 2004). This description of butchery practices and tool technology related to the Mission era and the effects upon the skeletal elements are consistent with some of the faunal remains excavated from the Presidio of Monterey. Furthermore, such practices of tool technology were also cited by Gust in her study of the bovid faunal remains from the Ontiveros Adobe.

Based on said descriptions, those appendicular faunal assemblages of the Royal Presidio of Monterey collection that are broken at, or near the center of the shaft of the skeletal element may in fact have been produced by axes, as opposed to those cutting implements utilized in the experimental component in this capstone study. Knives, on the other hand, would have had a more functional use when cutting tendons and removing the muscle attached to those skeletal elements (St. Clair 2004). For example, knives would be used to cut ribs, likely producing multiple cutmarks. The use of knives to cut rib ribs would have resulted in great fragmentation and shattered bones. Such breakage was perhaps produced through the removal of the *fresada*, or that portion covering the ribs, as described at the Ontiveros Adobe (St. Clair 2004; Gust 1991). Again, this description of those fragmented rib elements is also consistent with the collection from the Presidio of Monterey. However, no ribs were broken or fragmented during the process
of the experimental butchery, therefore the removal of the frescada and/or butchering of the ribs that produced such results may have been related to the usage of an axe rather than a machete, cleaver, or obsidian flake cutting implements such as those utilized in the experiment.

*Experimental Archaeology: Analysis with Royal Presidio of Monterey Collection*

The objectives of this experimental archaeology component were to recreate butchery marks or cultural modifications with different Mission era and Native Californian cutting implements upon those skeletal elements as described in the abovementioned section “Experimental Archaeology: Procedures and Results”; additionally, the specific cutmarks and associated tool technologies, or the effectors, were hypothesized with the intentions that such would explain how the cutmarks from the faunal assemblage of the Royal Presidio of Monterey were produced and potentially identify the cultural actor. The following images (see Figures 16a-e, 17a-e, 18a-b, 19a-e, 20a-d, 21a-d, 22a-d, 23a-c, below) attempt to make such correlations through the visual comparison of those butchered faunal remains from the Presidio of Monterey with those produced in the experiment.
**A1 Rib 1** post-butcher. Note the chopmark on the right, saw marks center, and finer marks on the left end of the rib.

**Fig. 16b: RPC_00967.01v1**, also a rib bone, demonstrates a nearly identical chopmark as observed in **A1 Rib 1**, below.

*Fig. 16c:* Close up fine marks on of **A1 Rib 1**. The marks in the images on the right, (center) and below left, are also fine cut marks.

**Fig. 16d: RPC_02880.11v3** exhibits similar repetitive saw marks as observed in **A1 Rib 1**, above.

**Fig. 16e: RPC_03664.02v1** represents another example of a chopmark on a rib.
B1 Rib 3 post-butcher, multiple chop marks were identified on Rib 3, in addition to saw marks on the reverse (see below image).

Fig. 17b: RPC_00967.01v1, also a rib bone, demonstrates a nearly identical chopmark as observed in B1 Rib 3.

Fig. 17c: Close up saw marks on the reverse side of B1 Rib 3. Note similarity of closely spaced striations those images on the right (center), lower left and right images.

Fig. 17d: RPC_01162.02v3 rib bone originally identified with scrapemarks.

Fig. 17e: RPC_01808.01v1 rib or thoracic vertebrae originally identified with chopmarks.

Fig. 17e: RPC_00500.00v1 unidentified limb or long bone originally identified with fine marks.
B2 Soup Bone 2 cutmark of a V-shaped section was removed despite the overall low chopping quality of the cutting implement.

**Figure 18a**

**Fig. 18b: RPC_01848.03v3** this bone is unidentified, the markings here were identified as dismemberment. The marking is however similar to that of B2 Soup Bone 2 although the cutting implement was likely sharper and of higher quality than that used to create markings on B2 Soup Bone 2.
C1 Rib 4 post-butcher. Only two markings were identified on this bone.

**Fig. 19a**

<table>
<thead>
<tr>
<th>Fig. 19b: Close up of C1 Rib 4 with the identification of a fine cutmark.</th>
<th>Fig. 19c: Close up of RPC_00151.01v2 rib with what was originally identified as chopmark but is similar to the mark produced on C1 Rib 4 as noted in the image on the left.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. 19d: Close up of C1 Rib 4 with a flake scar identified.</td>
<td>Fig. 19e: RPC_03664.02v1 rib with a flake scar identified (right).</td>
</tr>
</tbody>
</table>
C2 Soup Bone 3 post-butcher. Note chopmark on the right, as well as those paralleled fine marks. Also of interest was the presence of a finely V-shaped cutmark produced by the obsidian flake.

Fig. 20b: RPC_01766.01v1 skeletal part with cutmarks originally identified as scrapemarks but have similar paralleled lines as C2 Soup Bone 3.

Fig. 20c: RPC_01148.02v1 skeletal part with chopmark similar to the one observed on C2 Soup Bone 3 in the above.

Fig. 20d: RPC_01680.01v1 limb or long bone with scrapemarks on the left and flake scars on the right.
**Figure 21a**

A/B/C3 Pork Shoulder post-butchered. These skeletal elements were dismembered during the experiment.

**Fig. 21b:** A/B/C3 Pork Shoulder post-butchered. Markings from dismemberment with A3. Note the similarities in location and cutmark typology in the images immediately below.

**Fig. 21c:** RPC_03516.01v1 Distal (trochlea) humerus originally identified with chopmarks.

**Fig. 21d:** RPC_02652.07v1 Proximal tubercle and head of rib, originally identified with dismemberment.
Figure 22a: A/B/C3 Pork Shoulder post-butchecky. Attempted dismemberment with A3 at the joint was enacted through chopping and sawing. Multiple horizontal striations identified at the end of this bone are associated with this dismemberment technique. Note the similarities in below images.

Fig. 22b: RPC_01414.62v1 limb or long bone identified with dismemberment.

Fig. 22c: RPC_01808.01v2, rib or thoracic vertebra bone originally identified with chopmarks.

Fig. 22d: RPC_01162.02v3 rib bone originally identified with scrapemarks.
Close up of **A/B/C3 Pork Shoulder** post-butcher. Note the overlapping V-shape striations in the right of the image, likely produced by C3.

**Fig. 23b:** RPC_01680.01v1 limb or long bone with scrapemarks on the left, and flake scars on the right.

**Fig. 23c:** RPC_02880.11v3 exhibits similar repetitive saw marks.

The interpretation of these findings within this experimental component is largely conjectural, but nonetheless informative for the production of cutmarks on faunal remains. The majority of those faunal remains from the Royal Presidio of Monterey that were compared to those in the experiment were found to have similar cut mark attributes. Without a more detailed examination, such as with a specialized microscopic lens, said similarities cannot be conclusively confirmed as matches in this study. However, it should be noted that there were multiple
instances in which experimental cutmarks were replicated and matched. In fact, several experimental cutmarks were similar with those from the collection, such as those of specimens A1 Rib 1 and B1 Rib 3 compared to chopmarks on RPC_00967.01v1 (see Figures 13 and 14, above). Similar results were obtained from specimens A/B/C3 (see Figure 22a-b-c, above).

Moreover, we hereby conclude imply that those cutting implements used in the experiment were comparable to those that produced the cutmarks identified archaeologically. The obsidian flake butchery study produced results comparable to Fisher’s study of lithic tool technologies. For example, Fisher notes several types of lithic cutmark patterns of a type that we identified in the Royal Presidio of Monterey collection. These included saw marks, scrapemarks, chopmarks, and flake scar striations of a type observed from archaeological specimens. Again, comparable findings were had with previous studies, but without further study, conclusions remain at best hypothetical.

**Conclusion**

The presence of cattle remains in those Spanish colonial collections examined, historical documentation reviewed, reifies the importance of the early California industry. However, the findings from these other Mission era settlements do not suggest any indications for butchery cutmark patterns that are distinctly culturally, socially, or economically different for the Native Californians and Spanish colonial settlers at those sites. Such conclusions were also determined by St. Clair in her studies of the faunal assemblages at Mission San Juan Bautista; St. Clair concluded that the consumption patterns of cattle could not be distinguished between the neophyte populations and the Spanish colonial settlers. Alternatively, in the cases of the Ontiveros Adobe and the Presidio of San Francisco, both sites discussed a California-style
butchering process. This Californio-style of cattle ranching and butchery techniques, however, likely emerged later than their Mission or Colonial era forbearers.

Ultimately, due to the prevalence faunal remains of cattle and other foreign (non-native to California) livestock recovered from Mission or Colonial era sites, the introduction of livestock by Spanish soldiers and settlers effectively impacted the dietary of those Native Californians in their respective regions. Furthermore, such evidence confirms a cultural continuum for Hispanic colonial butchery practices from other colonized regions of New Spain. Cultural modifications of faunal remains did not in this instance provide socio-cultural indications that serve to distinguish Hispanic husbandry and butchery techniques from those of Native Californians who resided however temporarily at the Royal Presidio of Monterey.

Furthermore, faunal remains recovered in quantity from the Royal Presidio of Monterey were recovered from a 1807 midden within said feature (Mendoza 2012). This finding constitutes a change in diet from those marine assemblages associated with earlier settlement patterns dated to circa 1770 to 1789. Cattle remains were dominant in subsequent periods (Mendoza 2012). From the findings at Terrace 1 at the Presidio of Monterey, it can be concluded that the emphasis on cattle represents the successful establishment and implementation of a ranching industry at the Presidio of Monterey (Mendoza 2012).

In addition to the Terrace 1 feature, culturally modified faunal remains recovered from the trenching operation at the Royal Presidio Chapel (see Figure 4, above) further contribute to presence of cattle in the dietary patterns of those occupants at the Royal Presidio of Monterey. As noted, the most significant quantities of cattle-related faunal remains under study were recovered from the following six trenches: Trench 3a; Trench 6; Trench 26; Trench 4a-b; Trench 9; and Trench 8a/c. Furthermore, Trenches 3a, 4a-b, 6, and 9 were found to have midden and/or
kitchen associations during the different periods of occupation of the Royal Presidio of Monterey spanning the inception of the earliest Chapel of 1770 through to the completion of the third presidio Chapel of 1794 (Mendoza 2012). Said trench sites may well constitute active butchery localities.

Ultimately, we hereby conclude that socio-cultural and economic distinctions between the soldiers and Native Californian laborers or families at the Royal Presidio of Monterey cannot at this time be discerned, at least not without further investigation. The population of soldiers and gente de razón consistently exceeded the population of Native Californians at the Presidio of Monterey. Furthermore, the population of Native Californians at the Presidio of Monterey was in a continuous state of flux depending on the numbers of Mission Indians contractors, and other Gentile day laborers and convicts. Despite this, we can infer that those actors executing the butchery duties and processes did so for the entire population of the Presidio, especially if those were contracted to serve the Presidio. Additionally, we can surmise that those Native Californian presidio laborers that manipulated their acculturated socio-cultural identity within the colonial setting were more likely acquire a level of social mobility for themselves and their descendants. Such is also interpreted in the case study of Rancho Petaluma, in which Silliman attributed those varieties of material culture (stone vs. metal tool technologies) as part of forging of new identities, rather than completely acculturating into a colonial settlement while integrating those pragmatic skills of native traditions into their labor (2004).

Moreover, this study would have been better served if a pre-Contact and/or Contact era Native Californian faunal assemblage provided a point of comparison for the faunal remains recovered from the Royal Presidio of Monterey. In that way, a clearer idea of those butchery or culturally modified faunal remains produced by Native Californians could then be established.
and compared with not only the collection from the Royal Presidio of Monterey, but also with that of the experimental archaeology component of this capstone project. Furthermore, the identification of Native Californian material culture, such as stone tool technology, found in conjunction with that of Spanish colonial material culture, such as ceramics or metal tool technologies could constitute a representation cultural contact and exchange rather than acculturation as was found at Rancho Petaluma. However, without the study of a Native Californian culturally-modified faunal collection, this capstone cannot in the final analyses confirm different butchery practices. Therefore, in the event that the study of this collection (or any other Spanish colonial faunal assemblages) is advanced, comparison with pre-Contact Native Californian butchery practices is suggested.
Acknowledgements

I would like to take this opportunity to first thank my capstone partner David L. Collyer III (a.k.a. the Butcher of Fort Ord) for his continued rational and patience with my otherwise mad and slightly obsessive disposition during this project. I am most gracious to Dr. Ruben Mendoza, professor, mentor, and friend. Moreover, I am very appreciative for his invaluable efforts to help see this project through with his provision of materials. I am indebted to John Grafton for his Spanish colonial blacksmith expertise and generosity in his efforts to provide authentic Hispanic colonial machete and other related materials, without which the experimental archaeology component would not have been possible. In turn, I would like to acknowledge the efforts and recommendations of both Jewel Gentry and Emily Nisbet integrated into this project. In addition, I grateful for high praise from Dr. Gerald Shenk, at least of the initial rendering of this capstone, (at least from what I heard from the grapevine), of which contributes to my efforts to pursue my research as a scholar of social and behavioral sciences.
Bibliography


APPENDICES

This section of the capstone serves as a point of reference and an extended visual representation of the faunal collection under study including the following appendices: Appendix I: Index of Faunal Assemblages by Trench; Appendix II: Faunal Index Image Catalog; and Appendix III: Experimental Spanish Colonial Butchery.
APPENDIX I

Index of Faunal Assemblages by Trench

Each table represents the selection of faunal assemblages with cultural modifications (or cutmarks) recovered from the Phases 2 and 3 (from 2007 to 2008) archaeological monitoring and excavations of thirty-one trenches adjacent with the entire perimeter of the Royal Presidio Chapel of 1794 by Dr. Ruben Mendoza of the Institute for Archaeological Science, Technology and Visualization of CSU Monterey Bay and his field crew of CSUMB archaeology students for the Royal Presidio Chapel Conservation Project.

These tables are organized by trench (although it should be noted that only those trenches that contained faunal remains with cultural modifications are listed in this index) and include each skeletal element(s)’ catalog number, preliminary identification of anatomical part, cutmark typology, and the index number to identify the associated image in Appendix II: Faunal Index Image Catalog. Tables by Jennifer A. Lucido, 2012.

### Trench 1

<table>
<thead>
<tr>
<th>Catalog Number CA-MNT-271H-</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>01090.01</td>
<td>Femur</td>
<td>Clean cut</td>
<td>RPC_01090.01v1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dismemberment</td>
<td></td>
</tr>
<tr>
<td>01090.03</td>
<td>Rib</td>
<td>Clean cut/chop</td>
<td>RPC_01090.03v1</td>
</tr>
</tbody>
</table>

### Trench 2

<table>
<thead>
<tr>
<th>Catalog Number CA-MNT-271H-</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>01143.05</td>
<td>Unidentified limb or long bone</td>
<td>Chopmark</td>
<td>RPC_01143.05v1</td>
</tr>
<tr>
<td>01147.04</td>
<td>Unidentified limb or long bone</td>
<td>Clean cut/break</td>
<td>RPC_01147.04v1</td>
</tr>
</tbody>
</table>

### Trench 3a

<table>
<thead>
<tr>
<th>Catalog Number CA-MNT-271H-</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>01148.07</td>
<td>Metacarpal (distal) Os coxae?</td>
<td>Clean cut/break Break</td>
<td>RPC_01148.07v1</td>
</tr>
<tr>
<td>01637.02</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01637.02v1</td>
</tr>
<tr>
<td>01637.03</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01637.03v1</td>
</tr>
<tr>
<td>01148.03</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01148.03v1</td>
</tr>
<tr>
<td>01637.01</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01637.01v1</td>
</tr>
<tr>
<td>01148.05</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_01148.05v1</td>
</tr>
<tr>
<td>01148.02</td>
<td>Unidentified limb or long bone</td>
<td>Chopmark</td>
<td>RPC_01148.02v1</td>
</tr>
<tr>
<td>01148.01</td>
<td>Unidentified limb or long bone</td>
<td>Clean cut</td>
<td>RPC_01148.01v1</td>
</tr>
<tr>
<td>01637.04</td>
<td>Unidentified limb or long bone</td>
<td>Dismemberment</td>
<td>RPC_01637.04v1</td>
</tr>
</tbody>
</table>
### Trench 4a

<table>
<thead>
<tr>
<th>Catalog Number CA-MNT-271H-</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>00151.01</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_00151.01v1</td>
</tr>
<tr>
<td>01515.00</td>
<td>Rib or thoracic vertebra</td>
<td>Break</td>
<td>RPC_01515.00v1</td>
</tr>
<tr>
<td>00124.10</td>
<td>Rib or thoracic vertebra</td>
<td>Chopmark</td>
<td>RPC_00124.10v1</td>
</tr>
<tr>
<td>01515.01</td>
<td>Rib or thoracic vertebra</td>
<td>Chopmark</td>
<td>RPC_01515.01v1</td>
</tr>
</tbody>
</table>

### Trench 4b

<table>
<thead>
<tr>
<th>Catalog Number CA-MNT-271H-</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>01414.62</td>
<td>Unidentified limb or long bones</td>
<td>Dismemberment</td>
<td>RPC_01414.62v1</td>
</tr>
<tr>
<td>01414.62</td>
<td>Dorsal Lumbar Vertebra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00442.01</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_00442.01v1</td>
</tr>
</tbody>
</table>

### Trench 5

<table>
<thead>
<tr>
<th>Catalog Number CA-MNT-271H-</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>01680.01</td>
<td>Unidentified limb or bone</td>
<td>Scrapemark with flake scars</td>
<td>RPC_01680.01v1</td>
</tr>
</tbody>
</table>

### Trench 6

<table>
<thead>
<tr>
<th>Catalog Number CA-MNT-271H-</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>02652.08</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_02652.08v1</td>
</tr>
<tr>
<td>00500.06</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_00500.06v1</td>
</tr>
<tr>
<td>00500.07</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_00500.07v1</td>
</tr>
<tr>
<td>01162.02</td>
<td>Rib</td>
<td>Scrapemark</td>
<td>RPC_01162.02v1</td>
</tr>
<tr>
<td>01162.01</td>
<td>Rib or thoracic vertebra</td>
<td>Chopmark</td>
<td>RPC_01162.01v1</td>
</tr>
<tr>
<td>01162.12</td>
<td>Unidentified limb or long bone</td>
<td>Dismemberment</td>
<td>RPC_01162.12v1</td>
</tr>
<tr>
<td>01162.06</td>
<td>Unidentified limb or long bone</td>
<td>Fillet/dismemberment</td>
<td>RPC_01162.06v1</td>
</tr>
<tr>
<td>00500.00</td>
<td>Unidentified limb or long bone</td>
<td>Fine</td>
<td>RPC_00500.00v1</td>
</tr>
<tr>
<td>Catalog Number</td>
<td>Skeletal Element</td>
<td>Cutmark Type</td>
<td>Index Image Number</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
<td>--------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>01625.03</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01625.03v1</td>
</tr>
<tr>
<td>01625.02</td>
<td>Unidentified limb or long bone</td>
<td>Clean cut/break</td>
<td>RPC_01625.02v1</td>
</tr>
<tr>
<td>01625.01</td>
<td>Unidentified limb or long bone</td>
<td>Clean cut/break</td>
<td>RPC_01625.01v1</td>
</tr>
<tr>
<td>02607.03</td>
<td>Unidentified limb or long bone?</td>
<td>Break with v-cut</td>
<td>RPC_02607.03v1</td>
</tr>
</tbody>
</table>

Trench 8a

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>02378.01</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_02378.01v1</td>
</tr>
<tr>
<td>02140.02</td>
<td>Rib</td>
<td>Break with cut</td>
<td>RPC_02140.02v1</td>
</tr>
</tbody>
</table>

Trench 8c

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>02206.00</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_02206.00v1</td>
</tr>
<tr>
<td>02235.01</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_02235.01v1</td>
</tr>
<tr>
<td>02235.02</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_02235.02v1</td>
</tr>
</tbody>
</table>

Trench 9

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>01808.02</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01808.02v1</td>
</tr>
<tr>
<td>01742.02</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01742.02v1</td>
</tr>
<tr>
<td>01750.01</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_01750.01v1</td>
</tr>
<tr>
<td>01750.02</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_01750.02v1</td>
</tr>
<tr>
<td>01962.05</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_01962.05v1</td>
</tr>
<tr>
<td>01808.01</td>
<td>Rib or thoracic vertebra</td>
<td>Chopmark</td>
<td>RPC_01808.01v1</td>
</tr>
</tbody>
</table>

Trench 10

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>01766.01</td>
<td>scapula or pelvic</td>
<td>Scrapemark</td>
<td>RPC_01766.01v1</td>
</tr>
<tr>
<td>02016.01</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_02016.01v1</td>
</tr>
<tr>
<td>01844.03</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_01844.03v1</td>
</tr>
<tr>
<td>00916.00</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_00916.00v1</td>
</tr>
</tbody>
</table>
## Trench 11

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-</td>
<td>Rib</td>
<td>Dismemberment</td>
<td>RPC_01848.03v1</td>
</tr>
<tr>
<td>01848.03</td>
<td>Assorted Unidentified limbs or long bones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01779.04</td>
<td>Distal (trochlea) humerus</td>
<td>Dismemberment</td>
<td>RPC_01779.04</td>
</tr>
<tr>
<td>01779.01</td>
<td>Unidentified limb or long bone</td>
<td>Clean cut with smaller marks</td>
<td>RPC_01779.01v1</td>
</tr>
</tbody>
</table>

## Trench 12

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_01931.06v1</td>
</tr>
<tr>
<td>01931.06</td>
<td>Rib</td>
<td>Clean cut/break</td>
<td>RPC_00967.01v1</td>
</tr>
<tr>
<td>00967.01</td>
<td>Rib</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Trench 13a

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_02027.01v1</td>
</tr>
<tr>
<td>02027.01</td>
<td>Rib</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Trench 13c

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_02037.02v1</td>
</tr>
<tr>
<td>02037.02</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_02037.01v1</td>
</tr>
<tr>
<td>02037.01</td>
<td>Rib</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Trench 14

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-</td>
<td>Unidentified limb or long bone</td>
<td>Fine</td>
<td>RPC_01814.01v1</td>
</tr>
<tr>
<td>01814.01</td>
<td>Unidentified limb or long bone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01814.04</td>
<td>Unidentified limb or long bone</td>
<td>Chopmark</td>
<td>RPC_01814.04v1</td>
</tr>
<tr>
<td>02027.01</td>
<td>Rib</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Trench 15

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-02649.07</td>
<td>Unidentified limb or long bone</td>
<td>Dismemberment</td>
<td>RPC_02649.07v1</td>
</tr>
<tr>
<td>CA-MNT-271H-02649.06</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_02649.06v1</td>
</tr>
</tbody>
</table>

### Trench 16

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-02652.07</td>
<td>Proximal tubercle and head of rib</td>
<td>Dismemberment</td>
<td>RPC_02652.07v1</td>
</tr>
<tr>
<td>CA-MNT-271H-01428.00</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_01428.00v1</td>
</tr>
<tr>
<td>CA-MNT-271H-02652.08</td>
<td>Rib</td>
<td>Chopmark</td>
<td>RPC_02652.08v1</td>
</tr>
</tbody>
</table>

### Trench 18

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Bone Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-02661.01</td>
<td>Rib or thoracic vertebra</td>
<td>Clean cut</td>
<td>RPC_02661.01v1</td>
</tr>
</tbody>
</table>

### Trench 21

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-02880.02</td>
<td>Unidentified limb or long bone</td>
<td>Dismemberment</td>
<td>RPC_02880.02v1</td>
</tr>
<tr>
<td>CA-MNT-271H-02880.11</td>
<td>Distal metacarpal Distal (trochlea) humerus</td>
<td>Fine</td>
<td>RPC_02880.11v1</td>
</tr>
<tr>
<td>CA-MNT-271H-02868.07</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_02868.07v1</td>
</tr>
</tbody>
</table>

### Trench 23b

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Bone Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-03152.02</td>
<td>Rib eye</td>
<td>Clean cut</td>
<td>RPC_03152.02v1</td>
</tr>
</tbody>
</table>

### Trench 24

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-MNT-271H-03104.04</td>
<td>Rib</td>
<td>Chopmark with flake scar</td>
<td>RPC_03104.04v1</td>
</tr>
</tbody>
</table>
### Trench 24b

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>03869.02</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_03869.02v1</td>
</tr>
<tr>
<td>03109.02</td>
<td>Metacarpal (proximal)</td>
<td>Break</td>
<td>RPC_03109.02v1</td>
</tr>
<tr>
<td>03109.04</td>
<td>Femoral</td>
<td>Clean cut/break</td>
<td>RPC_03109.04v1</td>
</tr>
</tbody>
</table>

### Trench 25

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>03253.01</td>
<td>Rib or thoracic vertebra</td>
<td>Fine</td>
<td>RPC_03253.01v1</td>
</tr>
</tbody>
</table>

### Trench 26

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>03664.01</td>
<td>Femoral head</td>
<td>Break</td>
<td>RPC_03664.01v1</td>
</tr>
<tr>
<td>03664.02</td>
<td>Rib</td>
<td>Chopmark with flake scar</td>
<td>RPC_03664.02v1</td>
</tr>
<tr>
<td>03669.06</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_03669.06v1</td>
</tr>
<tr>
<td>03669.11</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_03669.11v1</td>
</tr>
<tr>
<td>03669.04</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_03669.04v1</td>
</tr>
<tr>
<td>03669.03</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_03669.03v1</td>
</tr>
<tr>
<td>03664.03</td>
<td>Rib</td>
<td>Fine</td>
<td>RPC_03664.03v1</td>
</tr>
<tr>
<td>03669.02</td>
<td>Thoracic vertebra</td>
<td>Chopmark with flake scar</td>
<td>RPC_03669.02v1</td>
</tr>
</tbody>
</table>

### Trench 27

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Bone Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>03511.00</td>
<td>Humerus (distal)</td>
<td>Clean cut/break</td>
<td>RPC_03511.00v1</td>
</tr>
</tbody>
</table>

### Trench 30

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Skeletal Element</th>
<th>Cutmark Type</th>
<th>Index Image Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>03516.01</td>
<td>Distal (trochlea) humerus</td>
<td>Chopmark</td>
<td>RPC_03516.01v1</td>
</tr>
</tbody>
</table>
APPENDIX II

Faunal Index Image Catalog

This Faunal Index Image is ordered numerically by catalog number. For descriptions on preliminary identification of skeletal part and cutmark typology, reference Appendix I: Index of Faunal Assemblages by Trench. Photos by Jennifer A. Lucido and David L. Collyer, 2012.

RPC_00124.10v1  RPC_00124.10v2

RPC_00151.01v1  RPC_00151.01v2
RPC_0269.016v1

RPC_0325.01v1
RPC_01090.01v1

RPC_01090.01v2

RPC_01090.03v1

RPC_01090.03v1

RPC_01143.05v1

RPC_01147.04v1
APPENDIX III

Experimental Spanish Colonial Butchery

This appendix presents results from the experimental archaeology component undertaken during the course of this capstone study.

In this experiment, there were three cutting implements: (A) the first, a Hispanic colonial style machete with a flared-edge; (B) the second, a colonial-type cleaver/machete with a trapezoid-shaped straight-edge; and (C), the third, obsidian or flint un-retouched flakes (five total were used) created through the process of flintknapping; these obsidian cores originate from Lassen County, California. The selected meats included the following: 1) beef back ribs with a total of five ribs; 2) beef soup bones with a total of three; and 3) a single pork shoulder.

The images below are presented in the order of cutting implement. Photos by Jennifer A. Lucido, 2012.

A1 Rib 1
A1 Rib 2
A1 Rib 5
A2 Soup Bone 1

B1 Rib 3
The break in the above image was made post-butcher ing. Note that the break follows the flake scar.
B2 Soup Bone 2

C1 Rib 4
A/B/C3 Pork Shoulder