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The Impacts of Colonial and Environmental Processes on Ceramic Plainware at Salinas Province, New Mexico

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THE IMPACTS OF COLONIAL AND ENVIRONMENTAL PROCESSES ON CERAMIC PLAINWARE AT SALINAS PROVINCE, NEW MEXICO

By

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Bachelor of Arts
Walla Walla University
2009

A thesis submitted in partial fulfillment of the requirements for the

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ABSTRACT

This thesis investigates whether Spanish demands on native time, labor and diet resulted in changes to the plainware ceramics used by the Salinas Pueblo Indians of New Mexico from the early 1600s to the 1670s. Increased pressures on native women’s time may have resulted in a decline in the quality of the ceramic pastes, an increase in the presence of mend holes, changes in household size and composition that may have resulted in changes in the sizes of cooking vessels, and a decrease in food availability that may have resulted in decreased sizes or quantities of storage jars. While the results showed that there were no significant changes in the plainware ceramics, the lack of change may be explained through ceramic intensification, potter conservatism, pottery idealism, and regional differences. Although my results were different from my expectations, I would suggest that scholars continue to study the material culture as a way to answer further questions about cultural change in the face of contact.
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CHAPTER 1

INTRODUCTION

Most scholars agree that the Spanish had a substantial impact on the lives of the Pueblo Indians. Impacts of colonial processes have been studied in different ways, including the influence colonists had on Native Americans with respect to disease and religious identity (Spielmann, Mobley-Tanaka, and Potter 2006; Gutiérrez 2006; Preucel 2002). A productive means by which archaeologists have studied the impacts of colonialism is through observing changes in ceramic production during the early contact period. For example, Spielmann, Mobley-Tanaka, and Potter (2006) have explored the ways decorated ceramics changed during Pueblo-Spanish interaction; they argue that the changes were a method of resistance to the Christianization enforced by the Spanish. Jeannette Mobley-Tanaka (2002) further suggests that the ceramics underwent changes in religious motifs—such as the symbol of the cross—as a way to resist Spanish influences by masking their native religious practices and confuse the Spanish. While these studies are crucial for the research of colonialism in the Southwest, they have focused primarily on decorated pottery. Little research has been devoted to plainware ceramics, which comprised an important aspect of native domestic economy. For my research, I chose to focus on plainware ceramics because they are part of a daily labor routine and have the potential to reflect changes in that routine. The plainware ceramics studied for this research can reveal how colonial processes in the Southwest impacted the time available to Puebloan women to perform daily tasks like pottery making. The ceramics may also reveal whether changes occurred in the native diet as a result of the Spanish presence.
Problem Statement

This thesis investigates whether Spanish demands on native time, labor and diet resulted in changes to the plainware ceramics used by the Salinas Pueblo Indians of the Gran Quivira region of New Mexico. Three specific hypotheses are advanced. First, I propose to test the hypothesis that increased pressures on native women’s time resulted in a decline in the quality of the ceramic pastes and an increase in the presence of mend holes. Second, I investigate whether changes in household size and composition resulted in changes in the sizes of cooking vessels. And finally, I investigate whether a decrease in food availability resulted in decreased sizes or quantities of storage jars.

Archaeological and historical evidence suggests that the Spanish occupation impacted the natives living at Salinas in several ways. Major impacts on the native population brought about through colonization included an increased demand for their time and labor and changes to their subsistence practices. It is possible that time pressures resulted from the Spanish demands for Puebloan labor and tribute payments in the form of food, hides, and possibly ceramics (Spielmann et al. 2009; Capone 1995). The natives’ ability to provide for their own basic subsistence was also impacted by Spanish demands for tribute in the form of food. As a result, the Puebloan community was unable to create a surplus due to both environmental and colonial pressures (Spielmann et al. 2009: 104; Hickerson 1994: 117). Such changes in native labor and diet are reflected in the skeletal remains and architectural features recovered from Gran Quivira (Spielmann et al. 2009) and may also be observed in ceramic manufacturing.
This thesis examines the impact the Spanish had on the Puebloan people of New Mexico’s Salinas District from the early 1600s to the 1670s, prior to the Pueblo Revolt of 1680. Ceramics were analyzed from two sites, Gran Quivira and Pueblo Blanco, and from two time periods. The earliest time period analyzed is the Intermediate Period (A.D. 1450-1600), when Spanish presence in the region was minimal. Also analyzed were ceramics from the Late Period (A.D. 1600-1675), a time when the Spanish were living in the Salinas District and when Spanish impacts to the Puebloan lifestyle are thought to have been substantial.

The first research question addressed is whether the demands placed on the Puebloan people by the Spanish resulted in less time being spent on domestic ceramic production. If so, I hypothesized that potters might have spent less time obtaining and preparing their ceramic pastes. This research question was addressed by examining the texture of the clays, since clays that are not properly ground, aged, and kneaded will be coarser and less homogenous than carefully prepared clays. I also examined the frequency of mendholes, since I anticipated that pots may have been mended more frequently during the Late Period if there was less time to make new vessels.

The second research question addressed is whether the changes that are believed to have occurred during the Late Period in household size and composition resulted in changes to the cooking vessels. Specifically, I anticipate that if many adult household members were working in Spanish households, then the household size would have changed and cooking jar sizes might have been altered to meet these changes.
The final research question has to do with changes in food availability. If provisioning the Spanish with food resulted in decreased food supplies for the Puebloan people, it is expected that the size and quantities of storage jars may have decreased.

Summary of Thesis Content

Following this introduction, Chapter 2 provides an introduction to the Pueblo Indians living throughout the Southwest and a description of those living in the Salinas Province of New Mexico. The chapter summarizes Puebloan lifestyle and provides the prehistoric and historic context for the study. Chapter 3 discusses the hypotheses examined in the paper and the methods used in the study. Chapter 4 discusses the results and conclusions of the research. Chapter 6 concludes the paper with a discussion on the implications of the findings.
CHAPTER 2

HISTORICAL AND CULTURAL CONTEXT

The Pueblo Indians are a regionally diverse group living across much of today’s states of New Mexico and Arizona. The term “Pueblo” was coined by the Spanish to describe these people because they lived in aggregated towns the Spanish called “pueblos” (Tyler, 1964: xiixiv). Today, Pueblo Indians are separated into three regionally distinct groups: the Western Pueblos, the Keresan Pueblos, and the Eastern Tanoan Pueblos (Griffin-Pierce 2000: 42).

Though there are many differences among the three regional Puebloan groups, it is their shared similarities that separate them from other Native American cultures. Prehistorically and historically, the Pueblo Indians were agriculturalists who subsisted primarily on maize, beans, and squash. Maize was, and still is, especially important to the Pueblo Indians and has played an integral role in their religious and ceremonial practices. At contact, all of the Puebloan people practiced a form of the Katchina religion, a tradition that continues to this day. Since the sixteenth century their practices have been influenced from their long history of interactions with the Spanish and Euro-Americans. Yet the Pueblo Indians remain distinct from other cultural groups and maintain their sense of identity as Puebloan people.

HISTORICAL PERIOD

The historical period of the Pueblo Indians began with the arrival of the Spaniards in the sixteenth century. The Spanish explorers first entered the Southwest in 1536 in search of gold and wealth, but it was not until Francisco Vasquez de Coronado explored
the territory in 1539 that these expeditions made a significant impact on the Pueblo Indians living in the Southwest (Vlasich 2005: 12).

The early Spanish exploration period took its toll on native populations, and resulted in Pueblo Indian deaths, depleted supplies, and abandoned settlements (Vlasich 2005: 16). For example, when Coronado entered the Southwest to search for wealth and to missionize the natives, his party’s mere presence imposed a hardship on the Native Americans because they relied on the natives’ scant food supplies to feed the expedition members (Vlasich 2005: 14).

Because the Spanish never found any great amount of wealth, explorers like Coronado eventually abandoned their efforts to search for gold. No significant new expeditions into the area were made until 1581 when religious fervor brought a new wave of explorers and colonists into the Southwest in an attempt to convert the natives to Catholicism (Vlasich 2005: 14). Years later, these new Spanish colonies would make the biggest impact on the native populations and their culture through the enforcement of Spanish laws and institutions (Vlasich 2005: 16).

When Spain opened up colonization in New Mexico, colonists were instructed not to harm the Indians or their properties, but this promise was not honored (Vlasich 2005: 17). Frequently, the colonists not only encroached upon Puebloan lands but also demanded tribute in the form of food and labor from the Pueblo Indians (Vlasich 2005: 18-19).

Spanish religious leaders of the time were also putting their own unique cultural pressure on the natives. Through their attempts to convert the Pueblo Indians to
Catholicism, the friars were slowly changing the Pueblo Indians’ identity and social practices. When the friars tried to convert the natives, they usually started by attempting to purge the Puebloan people of their native religious practices, by destroying religious paraphernalia and structures. The Spanish destroyed the natives’ religious kivas by filling them with dirt, and, in an attempt to cure idolatry, destroyed the idols and fetishes that represented Puebloan gods (Kessel 1979: 110).

By the early 1600s, the introduction of Christianity was having other consequences on Puebloan society. The friars’ destruction of Puebloan religious symbols resulted in an undermining of native traditional social practices. For example, the Spanish often focused on controlling Pueblo Indian youth by undermining the power of their elders. By Puebloan tradition, the Elders held not only the most authority but also the most religious power. By changing the religious structure of the community, the friars undercut and weakened the Elders’ religious authority, which subsequently reduced their influence in the community. By undermining the Elders’ authority, the friars became the new leaders of the natives (Gutiérrez 2006: 36).

Besides changing the power status within the Pueblo Indian society, the friars also changed the marital practices of the Puebloan people. Prior to contact with the Spanish, the Pueblo Indians practiced polygamy and sexually explicit rituals. The friars strictly forbade the natives from having more than one wife and restricted their explicit sexual practices that were important rituals to the natives (de Benavides, 1630: 31).

The natives responded to these changes in different ways. While some fully converted to Christianity and changed their practices because they had lost faith in their
Katchina gods, not all Pueblo Indians rejected their religion nor wished to lose the traditional practices that had been established before the Spanish arrived (Kessel 1979).

Tribute, forced labor, and the subversion of their religion and identity made the Pueblo Indians resentful, and in 1680, they rose up in rebellion against the Spanish (Vlasich 2005: 30-310). After driving the Spanish from the Southwest, many natives reverted to their ancestral beliefs while others continued to intertwine the religious and social practices of the Spanish with their own (Vlasich 32).

After the rebellion, the Pueblo Indians remained undisturbed by colonialism until the Spanish returned twelve years later to re-conquer the land they had lost. When the Spanish returned in 1692 to regain their territory, the Pueblo Indians once more became “wards of a foreign government” (Vlasich 2005: 33, 37). To avoid another rebellion, however, this time the Spanish tried to be less oppressive. Throughout the eighteenth century, they allowed the Pueblo Indians to hold onto their religious ceremonialism and allowed more native cultural practices to persist (Vlasich 2005: 37). The Spanish authorities also tried to protect the economic wellbeing of the Pueblo Indians by attempting to establish property and water rights, but Hispanic population growth made these laws challenging to enforce (Vlasich 2005: 38-39). Pueblo Indian land rights, along with water rights, were increasingly threatened by colonization (Vlasich 2005:58), and these troubles persisted into the nineteenth century (Vlasich 2005: 67).

The Pueblo Indians remained subject to foreign governments and laws as the natives in the Southwest fell under the jurisdiction of the Mexican and, later, the American governments. By the time the United States bought the New Mexico territory
in 1848, the population of the Pueblo Indians had declined through years of disease, drought, famine, and attacks from raiders and the Spanish. The Pueblo Indians had also begun to assimilate into the Hispanic culture so that by the time the territory was bought by the United States, the Puebloan population was less than the white and Hispanic populations in the area (Vlasich 2005: 68).

Even under the government of the United States, Puebloan people fought to defend their religious rights, their land rights, and their cultural identity. It was not until 1913 that Pueblo Indians were recognized by the U. S. government as Nations with inalienable rights; even after that, they continued to struggle against the U.S. government to maintain their cultural heritage and traditional practices (Sando 1998: 33).

Despite the gradual assimilation into the Hispanic and American cultures, the Puebloan people have found ways to remain a distinct native culture. Today, the Pueblo Indians have preserved their cultural identity by continuing their traditional katchina dances, holding their sacred ceremonies, and even preparing traditional foods. They live mostly on reservations provided by the U.S. government and continue to rely on trade, tourism, and agriculture for income (Griffin-Pierce 2000).

PUEBLOAN LIFEWAYS

The following provides an account of the Pueblo Indians lifeways prior to Spanish contact, and the resulting changes that occurred subsequent to their arrival. I provide a broad understanding of the subsistence, religious, and social practices of, primarily, the Eastern Pueblos and those along the Rio Grande. This regional focus best fits the practices and beliefs of the people of the Salinas area, who are the main focus of this
paper. The Eastern Pueblos are divided into two groups, the Keresan Bridge Pueblos and the Tanoan Pueblos. This introduction to the lives of the Pueblo Indians is based on archaeological, historical and ethnographic data.

Subsistence

For subsistence, all of the Puebloan people relied primarily on the cultivation of maize, beans, and squash. Maize served as an important food staple and was ritually important, often being used as an offering to the spirits or scattered for prayers or thanksgiving (Underhill 1991:24; Benavides 1996: 40). The Pueblo also ate a variety of squash, including Cucurbita moschata and a striped Cucurbita pepo, as well as a variety of beans, such as kidney and tepary (Underhill 1991: 35).

While reconstruction of Puebloan subsistence practices are sometimes based on ethnographic research, scholars have been able to reconstruct the primary subsistence foods by studying pollen samples and macrobotanical remains from multiple sites in the Southwest. One particular site—Arroyo Hondo Pueblo—analyzed by Wetterstrom (1987) contained very helpful data in uncovering Pueblo subsistence up until the early 1600s. Arroyo Hondo Pueblo is located five miles from Santa Fe, New Mexico. It was one of the major settlements in the northern Rio Grande region during the fourteenth and fifteenth centuries (Schwartz xiii), and it appears to demonstrate the diet and subsistence practices of many of the pueblos surrounding the Rio Grande (Schwartz xiv-xv).

Based on pollen samples and the analysis of plant material found at the site, corn was clearly the most abundant food material used by the inhabitants at Arroyo Hondo Pueblo. Eighty-four percent of all the plant material in samples taken at the provinces at
Arroyo Hondo consisted of corn, and it was the most prevalent of all pollen samples as well. In addition to sample analysis, Wetterstrom also notes that storerooms excavated at Arroyo Hondo Pueblo had corncobs stacked in the rooms. This suggests that the inhabitants of the pueblo were able to store enough maize to offset poor growing seasons and drought (Wetterstrom 1987: 16).

Corn, however, was not the only food being stored at Arroyo Hondo. Samples from the site revealed evidence that the inhabitants also subsisted on beans and squash. Beans consisted of only nine percent of the samples taken at the pueblo, but it is argued that both beans and squash may have been more abundant at Arroyo Hondo than the archaeological record can show (Wetterstrom 1987:11). Therefore, the analysis from this particular site suggests that cultivated crops such as maize and beans were a large part of the subsistence along the Rio Grande.

Historical records corroborate the archaeological findings concerning Puebloan subsistence. Spanish explorers in the early seventeenth century provide some of the best accounts of Puebloan agriculture and subsistence. Historical documents describe Pueblo Indian irrigation and agricultural techniques and inform on the crops and wild foodstuffs used to supplement their diet. More importantly, these documents also provide information regarding the amount of food being produced and stored by the Pueblo at the time of contact.

During an expedition into New Mexico in 1590-1591, a Spaniard named Gaspar Castaño de Sosa documented that the Pueblo had around the equivalent of approximately forty-eight thousand bushels of maize in storage as well as large quantities of beans
preserved in their storage rooms (Vlasich 2005: 15-16). Just as Wetterstrom documented storage rooms containing maize and beans at the prehistoric site Arroyo Hondo, historical documents, such as de Sosa’s records, corroborate the archaeological data. These examples demonstrate that the Pueblo Indians were successfully farming, harvesting, and storing surplus agricultural foods at the initial Spanish contact.

Historical documents also show that other foods were regularly consumed by the Pueblo Indians to supplement their diet. The Eastern Pueblo Indians considered piñon nuts a staple and regularly obtained bison meat from the Plains Indians. Jackrabbits and other wild game were also part of the Puebloan subsistence (Benavides 1996: 9), but there were not many domesticated animals during the prehistoric and protohistoric periods. Until the Spanish introduced Old World animals, the only domesticated animal for a meat source was the turkey (Kessel 2008: 9).

Cooking Practices and Food Storage Practices

Food storage and preparation were similar among the various Pueblo Indian groups. Archaeological data show that Western Puebloan people stored and processed their food in separate rooms from their habitation. They processed corn by drying it on the roof, then sorting it by color, and stacking the cobs in storerooms located adjacent to the habitation rooms (James 1997: 440). Corn was cooked or boiled on the cob, or ground into a paste for bread or gruel. Historically, women spent up to three or four hours every day grinding corn for use in tortillas, dumplings, or bread (Gutiérrez 1991:16; Bandelier and Hewett 1938: 38; Underhill, 1991: 41). Squash was roasted, boiled, or dried for later consumption, and its seeds were saved for food (Bandelier and Hewett 1938: 38;
Underhill, 1991: 41). Beans were boiled and used in stews or smashed into a paste and made into wafers (Underhill 1991: 45).

Religion

All of the Puebloan groups follow the Katchina religion, though it varies in practice depending on the region. The Katchina religion, which is believed to have emerged around the fifteenth century, is based on the belief that ancestral spirits serve as mediators to the gods (Kessel 2008: 12). These spirits, known as Katchinas, not only serve as a way to communicate with the Puebloan gods, but they also serve important roles, like bringing rain to the crops (Adams 1991: 9). Among the Rio Grande Pueblos, the Katchinas are supernatural beings who come from the West (Dozier 1970: 156). As part of the Katchina religion, the natives conducted Katchina dances. These dances were a community ritual and a way for the Puebloan people to call on the powers of the Katchinas for blessings to the villages (Adams 1991: 11). Another integral part of the Katchina religion are kivas. Kivas are round, subterranean rooms that the Puebloan men used for religious or communal purposes (Kessel 2008: 13).

Social Organization

Social organization varies regionally among the Pueblo Indians. Ethnographic studies show that among the Keresan Bridge Pueblos, kinship is matrilineal (although today it is shifting toward being bilateral), and the clan is treated more as a kinship than a political entity (Griffin-Pierce 2000: 43-44). Kinship among the Eastern Tanoans is bilateral and the family usually consists of the extended family from both male and female sides of the family (Griffin-Pierce 2000: 44). Instead of clans as the political
organization, the Eastern Tanoans have moieties which serve as governing entities that manage daily tasks as well as ceremonial tasks (Dozier 1970: 167). Gutiérrez (1991) has provided insight from historical texts regarding women’s leadership roles among the villages at Acoma and the Rio Grande pueblos. If the practice was common among the Rio Grande pueblos, we can assume that the Pueblo Indians living at Salinas practiced matrilineal kinship.

Household Organization

In the late prehistoric and early historic times, pueblo homes consisted of a series of room blocks containing structures with adjoining walls. Within these room blocks, each household contained a central room with a hearth, rooms for sleeping, and a storage room. Each village might contain as many as 50 to 500 houses. These houses were structured around a central plaza, which contained several kivas (Gutiérrez 1991: 15). According to Gutiérrez, during the day, women’s work included preparing meals for the household (Gutiérrez 1991:16). Women were also responsible for making clothing, blankets, ceremonial apparel, and, of course, pottery (Frank & Harlow 1994: 12; Gutiérrez 1991: 17).

Pottery Production

Pottery production was time-consuming. To make a vessel, women first had to gather the clay (Bunzel 1969: 6). Once the clay was brought back to the village, it was cleaned of large inclusions or stones and then finely ground by the women. The paste was then prepared by combining clay with a nonplastic material called temper (Cordell 2009: 229). The women added the temper in the form of sand, pulverized stone, or ground potsherds (Frank and Harlow 1974:11; Bunzel 1969:6) which served as a binding agent.
in the clay. It kept the vessel from cracking during the firing process, and it made the clay more plastic and malleable (Frank and Harlow 1974: 11; Cordell 2009: 229).

After the clay was prepared, the women formed the vessels by stacking coils made from the clay on top of one another (Frank & Harlow 1974: 11). For plainware vessels, the next step involved smoothing and thinning the walls and then drying and firing the pots. Women fired the vessels in either a pit or a “framework of rocks” (Frank & Harlow 1974: 12) where the vessels were covered with a slow-burning fuel such as manure or wood. They were then baked for one or two hours until the clay was hard (Frank & Harlow 1974: 12). The production of pottery required substantial attention and care. It involved work beyond gathering the clay and the raw materials for the clay and building the pots. It included gathering water for mixing the clay, gathering firewood for firing the vessels, and taking the time to make the proper tools for producing these vessels (Crown & Wills 1995:177-178).

SPANISH IMPACTS TO PUEBOLOAN LIFESTYLES

During the 1600s, colonialism and environmental changes impacted the Puebloan lifestyle. The Spanish altered the natives’ religious practices, subsistence practices, and daily schedules while environmental changes exacerbated the social and economic pressures brought by the Spanish. The following describes these changes that occurred from the early 1600s to the 1670s, and examines how these pressures may have impacted the daily labor and diet of the Puebloan people.

In 1595, the King of Spain opened the territory now known as New Mexico for expansion to Spanish colonists, but there had already been Spanish activity in the area
since 1536 (Knaut 1964: 21). Expeditions to the region were first conducted based on false rumors that there were cities of great wealth in that area, but the expeditions were abandoned once nothing of value to Europeans was found. In the 1580s, expeditions were conducted again, but this time the Spanish Crown ordered that the explorers would only be funded if they sought to convert the Indians to Christianity. It was during this time, therefore, that regular contact was initiated between the Pueblo Indians and the Europeans (Knaut 1964: 23-24).

By the early 1600s, the Spanish had impacted native social structures by installing new leaders, which undermined the authority of the Pueblo Elders (Gutiérrez 2006: 36). Additionally, in an attempt to eradicate Puebloan religious practices, they filled kivas with dirt and destroyed idols and fetishes (Kessell 1979: 110). While these changes were to native social and religious structures, other changes may have affected the Pueblo diet and work schedules. The following discussion addresses changes that potentially impacted the native diet and the time available for conducting daily tasks, including pottery production.

Effect of Introduction of New Plant and Animal Species

The Spanish settlers impacted native life through the introduction of new foods and animals. While these changes were sometimes beneficial to the natives, for the most part, they were detrimental. Several types of crops and animals were introduced to the Southwest. Rothschild (2003) explains that the Spanish introduced new crops like fruit trees that produced apples, peaches, and apricots. Watermelons, wheat, barley, grapes, and cantaloupes also became part of the diet (Rothschild 2003: 58). Vlasich recorded that the Spaniards brought new foods into the Southwest as early as 1592. According to
Vlasich, when Spaniard Don Juan de Oñate set out to colonize New Mexico, he brought with him wheat, flour, and animals. He also brought tools used to cultivate the new crops and care for the animals that were brought to the Pueblo Indians (Vlasich 2005: 17).

The introduction of these Old World crops impacted native lifestyles. The introduction of wheat was useful for the natives because it allowed them to offset a possible poor growing season in the spring and summer. Unfortunately, the introduction of new crops like wheat also increased the amount of time it took to process new foods. This was observed among the Zuni who cultivated corn, beans, and squash and some cotton prior to contact, but when the Spanish introduced wheat, this new crop required more storage and processing time (James 1997: 441).

The Spanish were not always able to rely on the European crops that they brought. Often, the Spanish failed at farming in the Southwest and were unable to be self-sufficient. Therefore, they often relied upon the Pueblo Indians to provide them food. When the Spanish entered the Southwest, they intended to cultivate the crops they brought, but some of the colonies did not predict the unique growing conditions in the region. One colony established at San Gabriel along the Rio Chama struggled to grow food. Oñate’s crops also failed and his colony’s inability to grow their own food made the Spanish dependent on native crops to survive. Oñate recognized this dependence and stated, “[l]acking the wherewithal to raise crops in this arid region, the settlers solicited relief from the Indians in the form of maize, and this action drew many complaints from the native farmers” (Vlasich 2005:18). Not only does this quote suggest that the new crops were less successful in this environment, but it demonstrates that the Spanish were hardly self-sufficient and, instead, had to rely upon the Puebloans’ food stores to survive.
In these scenarios, the failure of the Spanish to farm their Old World crops placed a burden on the natives. Because the Pueblo Indians were forced to provide for the Spanish, their supplies and surplus were depleted. In addition to the food shortages and the inability to often offset these shortages with Spanish crops, the introduction of animals also placed a burden on the natives.

Old World animals introduced to the Southwest were either useful or a nuisance for the Puebloan people. Spielmann et al. (1990) explains that, initially, the livestock were not intended for native use. She and her colleagues claim that “[w]hile Spaniards did introduce domestic animals into New Mexico, domestic livestock was raised largely by the Spanish friars for export to northern Mexico to pay for church furnishings” (Spielmann et al. 1990: 748). Cattle, sheep, and goats, however, were still given to the Pueblo Indians because they were a way for the friars to retain native converts (Reff 1993: 563).

The destruction of crops by livestock was one of the many problems native farmers experienced. Vlasich explained that these grazing animals tended to stay near the river where most of the agricultural fields were located. Eventually, he claims, “[t]he untended stock began to encroach on Pueblo farmlands, eating their crops and damaging irrigation canals” (Vlasich 2005: 22). Rothschild explained that sheep were important to native subsistence, but they also had negative effects on the Pueblo Indians. According to Rothschild, these animals “…caused changes in plant communities, environmental degradation, and erosion” (Rothschild 2003: 58). Barrett adds that the introduction of cattle also had a negative effect. According to Barrett, “Pueblo food production suffered, as it did when livestock owned by the clergy or by settlers invaded Pueblo fields and
destroyed crops” (Barrett 2002: 70) More importantly, however, was that the time required for the Pueblo Indians to raise and breed livestock detracted from the time they had to work in the fields and irrigation canals (Vlasich 2005: 23). Therefore, even though later historical periods would suggest that the introduction of animals had a positive effect on Puebloan subsistence, the initial contact brought many problems.

**Effect of Encomienda and Repartimiento**

Two of the largest impacts on the Pueblo Indians derived from the practices of the *encomienda* and *repartimiento*. The *encomienda* granted the colonists land in the Southwest and ordered that the conquered people—in this case, the Puebloan Indians—work for them (Anderson 1985: 353; Vlasich 2005: 24). Described by Anderson as serfdom, the *encomienda* was a reward to those who were expanding the empire and an encouragement to colonize new territories (Anderson 1985: 353-354). While the *encomienda* provided the Spanish with food and valuable items that could be sold or traded, the Catholic Church used it to teach Catholicism to the Indians (Anderson 1985: 354).

The colonists were granted not only *encomienda* but also *repartimiento*, which allowed them to exploit native labor, which was used for the survival of the colonists and their accrual of wealth. While the *encomienda* was treated as a tax placed on the Pueblo Indians, the *repartimiento* was a tribute-labor system imposed on the natives. Under the Spanish command, the Pueblo Indians were forced to work as field hands, servants, and craftsmen for the Spanish (deFrance, Susan D. and Hanson Craig A., 2008: 302).
Several scholars agree that from nearly the beginning of its establishment in the Southwest, the *encomienda* tribute and the *repartimiento* were severely abused. The *repartimiento* already had a harsh reputation in other colonies. According to Wiedner (1960), in 1535, the Spanish established a *repartimiento* to uphold their political control over the Peruvians. The labor mostly involved working in the fields, but it also included work in colonial homes (Wiedner 1960: 359-360). One of the biggest problems for the Peruvians was that the Spanish were not allotting enough time for the natives to do their own work and food production. According to the author, “…instead of alternating two weeks of rest with one week of work, it was found more convenient to require four straight months of work” (Weidner 1960: 368). This took precious time away from the natives to tend to their own crops, to build a surplus for trade, and to put time into other activities important for food production.

The *repartimiento* was similarly enforced in New Mexico. Despite Spain’s attempt to establish rights for the natives, the colonists (Anderson 1985: 354) and even the clergy ignored these rights (Scholes 1936: 400). Colonists heavily abused servitude and slavery under this system. For example, by 1630 Santa Fe had a population of 250 colonists with “700 Indian and mezito servants and slaves” (Gutiérrez 1991: 104), and by 1680, half of the domestic households “…had at least one Indian slave,” while other households owned more than one (Gutiérrez 1991: 104). The friars were also accused of exploiting native labor. They used natives to construct missions and homes and hired the natives to work as servants, cooks, and portsmen. Furthermore, the natives were used for labor in the fields to work as farmers and herdsmen (Scholes 1936: 400).
The colonists also abused the amount of tribute demanded from the natives.

According to Gutiérrez:

*Encomienda* tribute was assessed by household irrespective of size. Yearly each Indian household paid their *encomendero* ‘one *fanega* [approximately 2.6 bushels] of maize…valued at four *reales* and also a piece of cotton cloth six palms square [about 5.6 feet square] which is reckoned in price at six *reales.*’ (A hide of the same value could be substituted for the cloth.) Tribute was collected twice a year, with the May contribution usually consisting of cloth and skins, and that in October, coming shortly after the harvest, usually consisting of corn (Gutiérrez 1991: 105).

Barrett (2002) asserts that the *encomienda* was responsible for food shortages among the Pueblo Indians, and left them unprepared for poor growing seasons. She states that the forced labor and food supply “represented a diversion of resources from people living in a marginal environment and, in the case of maize, a smaller surplus to set aside for the inevitable drought years” (Barrett 2002: 69). Vlasich also supports this claim, and explains that even historical documents describe the worsening Puebloan conditions as direct results of Spanish colonization. For example, Vlasich explains that Fray Francisco de San Miguel claimed that the Spanish were demanding food from the Pueblo Indians who were not able to meet these demands. As Fray Francisco witnessed, the natives reached a point at which they were running out of supplies and forced to eat any food they could from the fields—even roots (Vlasich 2005: 19). By 1643, the tribute was so harsh that many Pueblo Indians fled and became refugees among the Apaches.
By then, Pueblan populations had dropped to the point that colonists were demanding tribute from individuals rather than households, and the Pueblo Indians were unable to meet these demands (Gutierrez 1991: 117).

Effect of Disease and Raids

Colonial pressures alone did not put a strain on the Pueblo Indians in the seventeenth century. Disease swept through many of the Pueblo towns in New Mexico and killed approximately three thousand Native Americans, which comprised just over ten percent of the entire Pueblan population (Scholes 1936: 324). Conflicts between the Apache and the Pueblo Indians compounded the stress on Pueblan society. During the early 1600s, the Apaches began raiding the Pueblo Indians that bordered the plains. They burned their fields and destroyed their food. Scholes (1936) estimates that the Apaches burned approximately twenty thousand bushels of maize in a single year (Scholes 1936: 324).

Environmental Pressures

Environmental changes also contributed to the food shortages. A drought from approximately 1667-1672 (Riley 1999: 192) placed such a strain on the Pueblo Indians that some scholars suggest it was a contributing factor to the Pueblo Revolt in 1680 (Rothschild 2003: 59). The long-lasting drought depleted Pueblan and missionary storehouses, and by the end of it, both sides were so desperate for food that they were reduced to eating hides (Riley 1999: 192). It is important to note, therefore, that even though colonial pressures had a great impact on native food shortages other factors impacted the Pueblan subsistence base as well.
Even though the drought had a significant impact on the amount of food the Puebloan people harvested each year, it is likely that had it not been for the colonists’ demands, they likely would have had stored surpluses on which to depend (Barrett 2002). Additionally, without the presence of the Spanish restricting their mobility, they likely could have increased their reliance on foraged foods as they did in pre-contact times (Barrett 2002: 76). It was also very difficult to counter these losses by trading with other natives because the Pueblo Indians lacked the surpluses to trade with the Plains Indians for food like bison meat (Barrett 2002: 71). Hence Barrett (2002) believes that “…drought alone might not have produced such extreme famine conditions without the cumulative effects of Spanish exploitation and Apachean raiding” (Barrett 2002: 77).

While disease, drought, and colonial pressures impacted all of the Pueblo Indians, the nature and degree of these impacts varied depending on how pervasive the Spanish influences were in each area. Gran Quivira, which is the focus of this thesis, did not experience a pervasive Spanish occupation. The types of changes that did occur at Gran Quivira during this same period, however, did divert the natives’ time and energy from their own needs to the needs of the Spanish.

THE SALINAS PUEBLOS

Information Sources

Information we have on the Salinas Pueblos comes from historical texts and from excavations. Historical texts are often journals or letters belonging to friars and explorers who visited the Salinas district or lived there for a short time. However, most of the information we have about the region comes from excavations conducted in the 1960s and later.
Most of our archaeological knowledge about Gran Quivira derives from excavations conducted by Alden C. Hayes under the auspices of the National Park Service from 1965-1967. These excavations focused on Mound 7, which consisted of a collection of house mounds (Hayes et al. 1981: v). These were neither the first nor the only excavations conducted at Gran Quivira, but they were the first to provide insight concerning the pueblo’s architecture and the material culture. They also provide insight into the diet and mortuary practices of the people at Gran Quivira. While much of the following content used to describe the pueblo of Gran Quivira is taken from Hayes’ research, it is also taken from research resulting from field schools from Arizona State University.

The Salinas Pueblos are located in Central New Mexico, south of the Rio Pecos, the Jemez and Sangre do Cristo Mountains, and east of the Rio Grande River (Spielmann et al. 2009: 104). The province is broken into two groups, the Manzanos and the Jumanos. The Manzanos group is in the northwest region of the province near the Manzano Mountains and consists of the pueblos Tenabo, Abo, Quarai, Tajique, and Chilili. The Jumanos group is located in the southern part of the Salinas province near the Chupadera Mesa and the Gallinas Mountains. The Jumanos Pueblos include the pueblos Gran Quivira, Pardo, Colorado, and Pueblo Blanco. The Salinas Pueblos were well established by A.D. 1300, and all but Pueblo Colorado remained occupied until A.D. 1670 after which the villages succumbed to disease, famine, and Apache raids (See figure 1) (Spielmann et al. 2009: 104).
Figure 1. A map of central New Mexico showing locations of Gran Quivira and Pueblo Blanco
Located on the border between the Western Pueblos and the Plains Indians, Hayes describes the Salinas province as being “on the cultural frontier” (Hayes 1982:12) and influenced by the Mogollom, the Plains, the Anasazi, and the Apache. Though influenced by many outside cultures, they have many similar traits to other Pueblo Indians; they live in above-ground adobe houses, subsist as agriculturalists, share the same Katchina beliefs, and produce the same pottery styles (Hayes 1982: 12-13). The Salinas pueblos can be broken into different time periods: an early pre-history that reaches to A.D. 1450; an Intermediate Period that stretches to the time of early contact; and a Late Period, which is the time of colonial occupation. Discussions on Gran Quivira and Pueblo Blanco will include the Intermediary Period, which lasted from A.D. 1450-1600 and the Late Period, which lasted from A.D. 1600-1675 (Spielmann et al. 2009: 104).

Prehistory

The Pueblo Indians of the Salinas Province were of Mogollom and Anasazi descent. Around AD 900, the early inhabitants of Salinas were living in subterranean pithouses modeled after the Mogollom design and were primarily using a brownware ceramic. The natives began to incorporate the Anasazi culture around AD 1200 and began living in above-ground, adobe style homes. Their pottery also became more Anasazi in style and design. By AD 1550, the Pueblo Indians of Salinas had developed corrugated pottery, multiple room pueblos, and subterranean kivas; however, the Salinas Province had also separated into two linguistic groups. The northern part of the province (Manzanos Cluster) spoke Tiwa while the southern half of the province (Jumanos Cluster) spoke Tompiro (Hayes 1981, 6).
The Jumanos people were horticulturalists but often traded for bison with the Plains Indians (Hayes 1982: 15). Gran Quivira, also known as Las Humanas, is one of the southernmost pueblos of the Salinas Province in New Mexico. Prior to contact, Gran Quivira served as a trading post, and the natives living there acquired most of their food and luxuries through trade from the Plains Indians and other surrounding areas (Hayes et al. 1981: 11). Excavations at Gran Quivira reveal that the natives subsisted primarily on corn, but squash and beans were also staples at the site. Water, in fact, was a scarcer commodity. At Gran Quivira, wells were the primary sources of water, but there was some use of reservoirs and runoff at times (Hayes et al. 1981: 10). Overall, since water was a rare resource, agriculture was not a primary practice at Gran Quivira, and their primary subsistence depended mostly on trade. This sets the scene for the possible strains placed on the natives when the Spanish entered the region.

History

The Salinas Province was occupied by the Spanish as early as the fifteenth century (Graves 2004: 43) with different parts of the province being occupied at different times. Gran Quivira, for example, was settled in 1629 when a mission was briefly established, but a permanent presence was not put into place until 1659 (Hayes 1981: 1). Pueblo Blanco was occupied by the Spanish in the mid-1600s until 1670, at which time the pueblo was abandoned due to drought and famine.

Evidence suggests that the Spanish influence had an impact on everyday life at Gran Quivira. Excavations at the site have revealed that the smaller kivas at Gran Quivira
were destroyed, quite probably by the Spanish friars in an attempt to eradicate their native religious practices. If so, however, based on evidence of native religious practices found in the households, this attempt was not successful (Hayes 1981: 9). Spanish influence is also seen in construction of some pueblo rooms that reflect European styles. Eight rooms seem to have been built around 1630 for the Spanish friar Francisco Letrado, who stayed at Gran Quivira for only one year. Letrado was replaced by another friar not long after (Hayes et al. 1981: 32).

As elsewhere, the Spanish introduced Old World animals to Gran Quivira. Trash deposits dating to around 1659 contained animal bones of domestic animals. Hayes suggests these replaced the wild animals as the primary meat source (Hayes et al 1981: 9). This is reflected in faunal collections recovered from the site which indicated that domestic cattle replaced pronghorns as the major faunal remains, and the cattle consisted of 43.71 percent of the meat that could have been available (McKusick 1981: 65).

While the Jumanos pueblos did not house a mission until the 1660s, the Spanish presence, nonetheless, likely impacted the amount of time the natives could devote to their own daily work. Constraints on time would have resulted from the taxes and tributes they were forced to provide. In the Salinas Province as a whole, tribute for the encomienda was given in the form of food, hides, and labor. For food tribute, the natives were expected to provide salt, maize, and piñon nuts for the Spanish (Spielmann et al. 2009: 104). An increase seen in corn production at Gran Quivira in the post-colonial period likely reflects these demands. Spielmann discovered that the ratio of corn kernel to seed revealed that people were eating more corn than other types of wild seeds available at three of the Salinas pueblos, including Gran Quivira (Spielmann et al. 2009: 116). It is
likely, therefore, that this increase in corn production was a result of tribute (Spielmann et al. 2009: 117). Another time consuming hardship was that the natives in Salinas were required to process hides and generate goods for trade to other locations in the Rio Grande area for the Spanish (Spielmann et al. 2009: 104). The Puebloan men were also responsible for transporting food, such as corn, from the southern pueblos, like Pueblo Blanco and Gran Quivira, to missions outside the province (Spielmann et al. 2009: 104).

In addition to caring for the domestic animals introduced to the region and meeting the demands of food production for the Spanish, the natives also had to produce commodities for trade. For example, a common practice at Gran Quivira was to process hides obtained in trade from Plains Indians. They also had to produce more pottery at the site to give to the Spanish so that the Spanish could trade the pots as revenue (Capone: 1995, 280). Studies of skeletal markers have allowed archaeologists to estimate how much of an increase in labor there was for the natives at this province. Women’s labor, for example, increased in the colonial period and even older women were more involved in the forced labor during the colonial period than the pre-colonial period. In this way, therefore, the older women “appear to have taken on additional tasks to relieve the stress placed on Pueblo life when the workload of middle adult women increased to include more processing and labor in the fields” (Spielmann et al. 2009: 118). Though based on skeletal markers, it appears that their work tended to be of a motion consistent with the domestic work of using side scrapers for processing hides and sewing (Spielmann et al. 2009: 118). The labor demands from the Spanish also impacted native men’s labors as indicated by skeletal markers. For example, having to transport materials from one location to the next for trade increased “burden bearing,” which is evident in the skeletal
remains of males (Spielmann et al. 2009: 118).

Unfortunately, it has been difficult to determine the extent to which Indian labor was used at the Jumanos pueblos; therefore, much of the hypothesis is dependent upon assumptions on the patterned behavior of the Spanish in other parts of New Mexico. All three pueblos were occupied by the Spanish but each to a varying extent. While Gran Quivira and Quarai had a mission built in the village, Pueblo Blanco, the other site studied in this paper, only housed a chapel that was not visited regularly (Rainey and Spielmann 2006: 489).

It is speculated that these demands may have refocused energy the natives had used to provide for their own needs into working for the Spanish. Hickerson, for example, explains that, generally, in the Southwest, the taxes placed on the natives resulted in diminishing native food surpluses along with “…impoverishing the standard of living of Indian households, and diverting many man-hours of labor from traditional occupations” (Hickerson 1994: 69). She also suspects such impacts were even greater at Salinas because of the water scarcity in the valley which existed and had negative effects on food production even before the Spanish presence (Hickerson 1994: 69).

The diet of the natives changed at Gran Quivira because of the Spanish involvement. The consumption of maize appears to have increased as native production increased to feed both the Spanish and the natives. Diversity in diet, therefore, decreased. Native food consumption became primarily corn and piñon nuts. The availability of meat was also lessened during the colonial period. Previously, they were able to trade with the Plains Indians for bison meat, but the actions of the friars had disrupted relations between
the Salinas and the Plains Indians (Spielmann et al. 2009: 104). Gran Quivira excavations reflect an increase in native consumption of cattle, which archaeologists suggest was to counter the unavailability of bison meat (Spielmann 2009: 112). Trash pits excavated at Gran Quivira also revealed sheep bones; however, because of Apache raids (Hickerson 1994: 117) and the difficulty keeping animals within their boundaries, Hayes believing natives were possibly butchering sheep for trespassing on crop fields (Hayes et al. 1981: 9).

The natives at Pueblo Blanco did not intensify their maize production in the colonial period, but they still appeared to be impacted by environmental changes and Spanish tribute demands. Spielmann et al. (2009) found that Pueblo Blanco showed a less drastic increase in the consumption of maize compared to other wild seeds during the Spanish occupation of the Salinas Province. Compared to natives living at Gran Quivira, Pueblo Indians at Pueblo Blanco subsisted more on wild resources instead of agricultural resources before and during the colonial period. Despite no noticeable change in maize production at Pueblo Blanco, Spielmann et al. consider that the villagers intensified their procurement of wild resources as tribute instead. Spielmann et al. say that a “…plausible scenario for Pueblo Blanco is that it became the primary supplier of wild food resources, antelope skins and piñon nuts, but was not generally a significant source of surplus corn for tribute” (Spielmann 2009: 117). It is also possible that while diet was significantly impacted at sites like Gran Quivira, Pueblo Blanco may not have been altered as much as the others. The population slightly increased at Pueblo Blanco, which suggests that it served as a place of refuge for natives of Salinas who were escaping the Spaniards. Furthermore, since the village had less interaction with the Spanish, it is possible that a
more normal subsistence practice may have been maintained at Pueblo Blanco until famine restricted food availability (Spielmann et al. 2009: 06). Food production and diet at Pueblo Blanco may not have been the same as that at Gran Quivira during the colonial period, but according to Rainey and Spielmann (2006), all three of the Jumanos pueblos relied more on maize as environmental and colonial pressures persisted in the mid 1600s (Rainey and Spielmann 2006: 489). Therefore, while the natives working at Pueblo Blanco may have been impacted differently than those at Gran Quivira, the natives’ diet became restricted in variety and availability, and daily labor increased as the Puebloan people were forced to gather more wild resources like seeds and salt for the Spanish.

While the Pueblo Indians adopted domestic animals on a limited scale, it appears that they rarely accepted any plants that had been introduced by the Spanish. Flotation samples from Gran Quivira identified one grain of wheat or barley, and a single peach pit was uncovered from one of the rooms of the convent. These small bits discovered suggest that the Puebloan people at Gran Quivira were not truly adopting Spanish crops. Archaeologists found a similar lack of evidence of Spanish crops at Pueblo Blanco (Spielmann et al. 2009: 117).

During this period, the Salinas province was slowly depopulating as a result of these strains. According to Hickerson, Native Americans continued to migrate out of the Salinas Province as a result of famine and Apache raids. Gran Quivia and Tabira, also known as Pueblo Blanco, were the first villages to be deserted (Hickerson 1994: 19). Gran Quivira was abandoned because of drought, Apache raids, and European establishments (Hayes 1981: 1). At Gran Quivira, health declined, mortality rates increased, and maternal health and pregnancy also declined in the colonial period.
It is apparent that during the Spanish presence, all the pueblos in Salinas experienced strains on their diet and daily practices. Labor increased significantly enough to show evidence in the skeletal markers of both women and men. Skeletal markers show us that the increased labor was also distributed to older women who re-entered the workforce to possibly help meet Spanish demands for trade goods and food production. Diet also changed enough that the natives were suffering from malnutrition. In all three pueblos, consumption of plant food became less diverse since all three pueblos had to focus on procuring corn and piñon nuts for tribute. Life expectancy decreased for men in Gran Quivira because of increased work and the burden of heavy loads while transporting goods in trade (Spielmann et al. 2009: 120). Such dietary and social changes suggest that we should be able to find evidence of the strains brought by the Spanish through changes in the daily work habits of the Puebloan people. If labor increased enough that natives were overworked from diverting their time and efforts toward the needs of the Spanish, we should see the effects of such a diversion of time in daily practices after the Spanish entered the region. The following chapter will discuss the hypotheses addressing these questions and present methods to test these hypotheses.
CHAPTER 3

RESEARCH QUESTIONS

After discussing the Spanish impact on the natives at Gran Quivira, Pueblo Blanco, and its surrounding area, I will discuss whether these impacts may be observed in the archaeological record. My overarching hypothesis is that the time restrictions and dietary changes placed on the native people can be observed in the archaeological record, specifically in pottery making. If the conditions were harsh enough to affect daily work, the following hypotheses address how this may have happened.

Research Issue #1: The Effect of Time Constraints

The first research question I will address is whether time constraints placed on the women of Gran Quivira in the historic period were reflected in the plainware ceramic assemblage. To answer this question, I hypothesize that a decline in the quality of paste preparation and an increase in mendholes would reflect these time constraints.

Decline in the quality of paste preparation. As the Spanish labor demands placed time constraints on the women at Gran Quivira, I predict that Puebloan women would try to find ways to reduce the amount of time it took to perform daily tasks. The Spanish required the Indians to give not only food and blankets to the colonists, but trade items like pottery as well. Capone (1995: 95) suspects that the forced increase in ceramic production resulted in “…changing production techniques toward more expedient technology” as a way of meeting demands. Since ceramic production intensified during the Late Period because of Spanish tribute demands, it is possible that the ceramic production process was hastened in different ways to meet the demands.
The earliest culinary ware found at Gran Quivira were corrugated or ribbed brownware or grayware tempered with quartz mica schist. The source of the material is unknown, but Warren (1981) suggests that women gathered temper from locations close to the pueblo village (Warren 1981: 71).

One of the more time-consuming practices of ceramic production was the preparation of the clay, but this preparation time could be reduced if the women spent less time preparing the clay, by properly kneading and aging the clay. If this did happen, then I would expect to see the texture of the clay change from a more homogenous texture to a more heterogeneous texture. A homogeneous paste means that the women spent the full amount of time preparing the clay. The paste would appear as a fine-grained texture, occasionally vitrified, or platy in appearance. The paste would also appear to be well kneaded because the temper particles would be evenly distributed in the clay.

If women spent less time on clay preparation, the paste may appear more heterogeneous in texture. The clay would have a coarser texture if less time was put toward washing the clay and kneading it. It would appear more grainy because the clay was not finely ground or crumbly because it was not fully aged. The paste may also have temper particles that are not evenly distributed throughout the clay because women did not knead the temper into the clay as thoroughly.

Next, I would expect women to see a change in the type of temper used in the clays because the type of temper can indicate that less time was put toward ceramic production. A sand temper could suggest women were not traveling far for a preferred temper source. Instead of using a traditional temper, women would choose a temper
located nearby and readily available like sand. This change in temper would, therefore, demonstrate a way to save time in ceramic production. Sand would also serve as an expedient temper because it would not need to be crushed like other tempers.

The final change I would expect to see is one in temper homogeneity. In a well-prepared ceramic, the size of the temper would be fairly even. If the temper was not well prepared and, rather, prepared hastily, I would expect to see the particles uneven in size. Research conducted by Betenson (2005) on Intermountain Brownware also found that pottery made in haste by semi-sedentary people often has large inclusions that are not finely ground (Betenson 2005: 79).

Crown (2001) once theorized that expedience could have led to poorly-crafted pottery (Crown 2001: 452), and Whalen (1994) says that other authors have suggested that ceramics are constructed differently when resources and time are limited (Whalen 1994: 8). Therefore, since I hypothesize that the women at Gran Quivira were over-worked by supplying surplus food, processing hides, and intensifying pottery production, I would expect them to save time by expediting the clay preparation for their plainware ceramics. If the clay paste appears to be heterogeneous in texture and temper distribution, if the temper changes to a sandy temper, and if the temper is heterogeneous in size, then I will conclude that there was less time put toward the clay preparation at Gran Quivira during the Late Period.

Increase in Mend Holes. Another way Native American women could reduce the amount of time spent making pots save time in ceramic production would be to extend the lives of their vessels through repairs. Young and Nagrant (2004) explain that Native
Americans often extended the lifetime of a valuable vessel by repairing it if it broke rather than making a new vessel. This process required drilling holes near the break and tying the pieces in place. To archaeologists, such mend holes are a telltale sign that that particular vessel was valuable ideologically or economically (Young and Nagrant 2004). While most vessels were repaired because of ideological or sentimental value (Young and Nagrant 2004: 53), women may also have chosen to repair day-to-day ceramics in lieu of making an entire new pot if time was limited. If this was the case, then I would expect the frequency of mend holes to be greater from the collections dating to the Late Period compared to those of the Intermediate Period.

Research Issue # 2: The Effect of Changes in Household Structure

The second question addressed is if the impacts to household structure are reflected in the plainware ceramic assemblage. The Spanish practice of repartimiento required many Pueblo Indians to work in the homes of colonists or in the missions of friars. This would have decreased the number of people residing in Puebloan households on a daily basis. Households may also have been reduced as a result of drought, famine, and disease. According to a Spanish census taken in the late 1620s, the overall population of the Salinas Pueblos was 10,000, but by the 1660s, it had dropped to 2,200 natives (Barrett 2002: 64). At Gran Quivira, the population was nearly cut in half because of famine, disease, and raids (Graves 2002: 77).

It is unclear how changes in household composition might have impacted native cooking practices. There are two opposing expectations. It is possible that women were cooking for fewer people if the nuclear family was smaller. If this happened at Pueblo Blanco, cooking jars would have decreased in size, which would indicate that women
were cooking for smaller groups. It is also possible that, with additional constraints on women’s time, fewer women cooked for larger family groups. If this occurred at Pueblo Blanco, cooking pots would have increased in size.

To determine how native cooking practices were impacted by pressures brought on by the Spanish, I focused on changes in vessel sizes. By comparing the size of cooking jars or serving bowls from the Intermediate Period to the Late Period, I can determine if the vessels increase or decrease in size. If the colonial and environmental pressures caused women to cook for smaller groups, I would expect to see the size of cooking jars become smaller. If fewer women, however, were cooking for larger groups, then I would expect to see the size of cooking jars become larger.

Research Issue #3: Effects of Decreased Food Availability

The third research question asks if there were any impacts to food availability reflected in the plain ware ceramic assemblage. At several sites, food availability plummeted and left the Native Americans without proper nourishment or enough food reserved to counter poor harvest years. At Gran Quivira, osteological evidence indicates that Puebloan women were malnourished, and macrobotanical data show that their food variety was limited to primarily maize and piñon nuts (Spielmann et al. 2009: 117). As noted earlier, while diet was not the same at Pueblo Blanco as it was at Gran Quivira, all three of the Jumanos pueblos turned to a dependency on famine foods, primarily maize, near the end of the 1600s (Rainey and Spielmann 2006: 489). Furthermore, storage has not been mentioned in any studies conducted in the Salinas area, but Spielmann et al. (2009:104) do note that the sites were abandoned in the late 1670s due to famine and
disease, which suggests that the Puebloan people were probably not able to meet their proper nutritional needs, let alone store for the future.

If food availability changed during this time period, I would expect to see less storage, which would be reflected in the number of storage jars and the size of the storage jars. If there was less food available to store, Puebloan women may have made storage jars smaller. This would reflect the expectation that there was less food availability and would also save women time in ceramic production if they made smaller vessels. Another expectation is that the quantity of storage jars may decrease. If there was less food available to store, I would expect a smaller ratio of storage jars to other ceramic vessels.

METHODS

Sampling

In order to conduct my research, I am focused on a ceramic collection that allows a comparison of pre-contact and post-contact plainware. For this reason, I used the ceramic collection from Gran Quivira and Pueblo Blanco at Salinas, which were available at Arizona State University. I focused on these collections because extensive research has been conducted on the pueblos at this site, and the ceramic collection spans the pre-contact and post-contact period, which is essential for my comparative analysis of the ceramics. The sherds used in this study are listed in Table 1. While the body sherds from Pueblo Blanco were available for research, I measured the rim sherds from Pueblo Blanco because the rim sherds from Gran Quivira were being stored in Tuscon and their availability did not match my schedule. For analyzing the temper and paste of the sherds, I randomly selected a sherd from an excavated square at interval levels, and was careful
that I did not sample an adjacent square. Selecting a sherd at random helps me verify that I am remaining objective in my data collection. Furthermore, selecting a sherd from squares and layers that are not adjacent to one another helps ensure that I am not studying sherds taken from the same vessel. This, therefore, keeps my data from being skewed.

Table 1. Rim Sherd and Body Sherd Count at Gran Quivira and Pueblo Blanco

<table>
<thead>
<tr>
<th>Provenience</th>
<th>Rim Sherds</th>
<th>Body Sherds</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gran Quivira</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td>0</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>Late</td>
<td>0</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td><strong>Pueblo Blanco</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td>181</td>
<td>0</td>
<td>181</td>
</tr>
<tr>
<td>Late</td>
<td>487</td>
<td>0</td>
<td>487</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>668</td>
<td>232</td>
<td>900</td>
</tr>
</tbody>
</table>

Attribute Analyses

The methods used to measure the first hypothesis, that time restrictions limited the quality of ceramic production, were primarily subjective comparisons in the clay and temper from pre-contact and post-contact periods. This involved examining the temper and paste of the sherds using a microscope to determine the texture of the clay. To determine whether the quality of the paste preparation changed, I looked at 88 body sherds from Gran Quivira’s Intermediate Period and 144 body sherds from Gran
Quivira’s Late Period. I recorded the texture of the clays from the Intermediate and Late Period and recorded whether the clay paste was homogeneous in texture or heterogeneous. I used a subjective ranking of homogenous by determining whether the clay appeared finely ground, platy, or vitrified, and heterogeneous by determining whether the clay was more crumbly or grainy in appearance.

I then examined the type of temper to determine how much time was put toward clay preparation. This was also a subjective study in which I observed if the tempers appeared to change from the Intermediate Period to the Late Period. I recorded the types of temper that I observed and if the temper was either a ground rock, a sand, or a ceramic temper.

In order to determine the size of cooking and storage jars, I measured the rim diameters of sherds from Pueblo Blanco. In order to answer the question as to if dietary changes impacted the size of the cooking jars and storage vessels, I studied rims from Gran Quivira’s contemporary, Pueblo Blanco. I measured the rim sherd diameter using a chart in which I compared the curvature of the rim sherd to the appropriate curvature on the chart. I also only measured rim sherds that had 5% or more of the arc present. The three different vessel types for rim analysis that I recorded were storage jars, cooking jars, and bowls. Storage jars have a rough interior and typically have a smaller mouth opening. I recorded vessels with larger mouths, scour marks, a smudged exterior, and encrustation on the rim as a cooking jar. Finally, I recorded vessels with a smooth interior and a large rim diameter as a bowl.
The ratio of storage jars to other pottery types was also measured. Determining which jars were used for cooking or storage was not always clear. Unless the collection contains diagnostic rims that are unique to storage jars or are particularly larger in size, it may be difficult to determine vessel type. Reconstructed vessels would be the best way to examine vessel type; however, the ceramic collection at Arizona State University did not provide complete vessels or large rim sherds to analyze. Therefore, I reduced storage jars and cooking jars into a single category as jars and then tested to see if the rim sizes of all jars analyzed changed over time.
CHAPTER 4

RESULTS

The Effect of Time Constraints

Decline in the quality of paste preparation. After examining the temper and quality of the clay, I concluded that there was a slight change in the clay and temper when comparing the sherds from the Intermediate Period and the Late Period. The clay texture changed slightly from being homogenous in texture in the Intermediate Period to being more heterogeneous in texture during the Late Period which can be seen in Table 2. Temper type changed to include more ground rock in the Late Period than the Intermediate Period. And, the inclusions were moderately ground but remained the same across both time periods.

Table 2. Comparison of Clay Texture from the Intermediate and Late Period at Gran Quivira

<table>
<thead>
<tr>
<th>Clay Texture</th>
<th>Intermediate Period</th>
<th>Late Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>(%)</td>
</tr>
<tr>
<td>Homogenous</td>
<td>81</td>
<td>(93%)</td>
</tr>
<tr>
<td>Heterogenous</td>
<td>6</td>
<td>(7%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>87</td>
<td>(100%)</td>
</tr>
</tbody>
</table>
Although a Chi-Square Test reveals that the differences between time periods in vessel type clays are statistically significant ($X^2=6.223$, df =1, $p<.05$), the effect size is low ($V=.164$). This means that while there is a difference in the temper qualities from the Intermediate Period and the Late Period, it is minimal, suggesting that there is little correlation.

In order to determine if the temper type changed during the colonial period, I compared the temper types found in the sherds of the two periods as observed in Table 3. Because there was a very small count in sherd temper, I omitted this category for the final test.

<table>
<thead>
<tr>
<th>Gran Quivira</th>
<th>Ground Rock</th>
<th>Sand</th>
<th>Ceramic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate</td>
<td>50</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>Late</td>
<td>107</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>Total Sherds:</td>
<td>157</td>
<td>68</td>
<td>2</td>
</tr>
</tbody>
</table>

I also found that there was a change in temper type when comparing sherds from the Intermediate Period and the Late Period. The temper type shifted from the temper being more sand in the Intermediate Period to including more ground rock in the Late Period, which can be observed in Table 4. This change is opposite my predictions and could mean that the temper does not reflect time spent on these ceramics. It could also
suggest that the ceramics were acquired through trade and were not made locally. A Chi-Square Test for the ratio of rock and sand tempers over time reveals that the differences between time periods in tempers are statistically significant ($X^2=6.223$, df =1, $p<.05$) however, the effect size is very minimal ($V=.199$). Therefore despite the apparent change in temper type, the effect size is too small to make the change significant.

Table 4. Comparison of Temper Types from the Intermediate and Late Periods at Gran Quivira

<table>
<thead>
<tr>
<th>Temper Type</th>
<th>Intermediate Period</th>
<th>Late Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>(%)</td>
</tr>
<tr>
<td>Ground Rock</td>
<td>50</td>
<td>(58%)</td>
</tr>
<tr>
<td>Sand</td>
<td>36</td>
<td>(42%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>86</td>
<td>(100%)</td>
</tr>
</tbody>
</table>

Finally, in order to determine if the temper was evenly distributed throughout the clay, I compared the ratio of sherds that’s tempers were well, moderately, or poorly sorted from the Intermediate and the Late Periods. Table 5 demonstrates the change in sorting from the Intermediate and Late Period at Gran Quivira. The Chi-Square Test for the ratio of sherds that were well, moderately, or poorly sorted reveals that the differences are not statistically significant ($X^2=4.697$, df =1, $p>.09$) and the effect size was minimal ($V=.143$).
Table 5. Temper Sorting from the Intermediate and Late Period at Gran Quivira

<table>
<thead>
<tr>
<th>Gran Quivira</th>
<th>Well Sorted</th>
<th>Moderately Sorted</th>
<th>Poorly Sorted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate</td>
<td>38</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Late</td>
<td>79</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Total Sherds:</td>
<td>117</td>
<td>44</td>
<td>68</td>
</tr>
</tbody>
</table>

Increase in Mend Holes. A comparative analysis of the 900 body sherds and rim sherds from the Intermediate Period and the Late Period from both Gran Quivira and Pueblo Blanco revealed no mend holes in the analyzed plainware ceramics. This could suggest that plainware ceramics from Gran Quivira and Pueblo Blanco may not have been repaired because the vessels were valued less than other ceramic types. It is also possible that the utilitarian vessels were not mended because their use would only continue to damage the vessel beyond effective repair.

The Effect of Changes in Household Structure and the Effects of Decreased Food Availability

Size of Cooking Jars. I was unable to determine the difference between cooking and storage vessels because of the lack of reconstructed vessels available to study and measure. Furthermore, while there were many jar sherds available in the Pueblo Blanco collection, there were not enough rim sherds with smudging or encrustation to determine vessel type. Of the vessels diagnosed as possible cooking pots or jars, the numbers were so few that I could not make a proper comparison of Intermediate and Late Period jars.
Because of this lack of data, I had to analyze all types of jars to determine if there were any changes in diameter and quantity from the Intermediate Period and the Late Period.

Because of the limited number of sherds at my disposal, the questions regarding whether or not cooking vessels and storage vessels increased or decreased in size could not be determined. Therefore, I combined my two separate questions into a single one and asked whether or not the size and quantity of all jars changed over the two time periods.

Proportion and Size of Jars

Of the 181 rim sherds analyzed from the Intermediate Period, the average rim diameter was 17.07 centimeters, with a standard deviation of 6.595. This was slightly smaller than the average rim diameter of the 487 sherds analyzed from the Late Period of 18.26 centimeters with a standard deviation of 6.913. However, an unpaired T-test demonstrated that these differences were not statistically significant ($t=1.618, p>.10$). Based on these results, therefore, I conclude that the sizes of jars do not change from the Intermediate Period and the Late Period at Pueblo Blanco. Therefore economic and social pressures do not seem to have impacted the size of jars. The data are illustrated in Figure 2.
Figure 2. Range of Rim Diameters in centimeters from the Intermediate and Late Period.

Of the 205 rim sherds analyzed from Intermediate Period, the ratio of bowls to jars (1:67.33) was smaller than the ratio of bowls to jars of the total 661 vessels from the Late Period (1:32.05). The data are illustrated in Table 6. Chi-Square Test of Independence for the ratio of jars to bowls over time, however, reveals that the differences between time periods in vessel type proportions are not statistically significant ($X^2=1.812$, df =1, $p>.17$). According to these results, therefore, the quantity of jars did not significantly increase over the time periods.
Table 6. Count of Jars and Bowls from Pueblo Blanco’s Intermediate and Late Period.

<table>
<thead>
<tr>
<th>Provenience</th>
<th>Jars</th>
<th>Bowls</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Publo Blanco</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td>202</td>
<td>3</td>
<td>205</td>
</tr>
<tr>
<td>Late</td>
<td>641</td>
<td>20</td>
<td>661</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>843</td>
<td>23</td>
<td>866</td>
</tr>
</tbody>
</table>
CHAPTER 5
DISCUSSION

Effects of Time Constraints (Mend Holes and Quality of Pastes)

Since my analysis showed no significant change in the quality of paste nor in the number of mend holes, I will present possible explanations for these results. The quality of pastes may have remained the same because of production standardization and the conservatism of the potter. The lack of mend holes can simply be attributed to the types of vessels being studied. It can also be attributed to fact that vessel availability was not limited, so it was unnecessary to repair plainware vessels.

The plainware ceramics from Gran Quivira and Pueblo Blanco may not have contained mend holes because the vessels were valued less than painted or glaze ware. Typically, plainware vessels are not valued enough to be repaired, and it is often rare to find vessels repaired at all. It is also possible that since we are dealing with plainware that was a low-cost in time and effort to produce, mending a broken utility vessel was not practical. Hagstrum’s ethnographic fieldwork which studied the time put toward creating different ceramic vessels found that cooking vessels took the least amount of time to produce while decorated vessels were more time consuming (Costin and Hagstrum 1995: 630).

It could also be argued that plainware vessels, like cooking pots and cooking jars, were not mended because of utilitarian purposes. It is difficult to know if repairs could be made water-proof or if the seals were tight enough to avoid liquids from leaking. Furthermore, a cooking jar would most likely continue to crack when placed over heat,
even if it were mended. If so, then it is possible that cooking jars were not repaired simply because the repairs would not restore the vessel to its original, fully-functioning state.

The consistency in the clay and temper preparation from the Intermediate Period to the Late Period could be a reflection of an intensity of ceramic production. Some scholars have suggested that a specialization in ceramic production can also affect the production quality. Specialization often corresponds with standardization in style and techniques. Clay production and preparation could also be standardized because a high level of intensity in ceramic production would require all of one’s energy in that single job of ceramic production (Costin & Hagstrum 1995: 620). Blackman et al. (1993) says that attributes often associated with craft specialization—especially in pottery manufacturing—were “…cost effectiveness and improved efficiency” (Blackman et al, 1993: 61). Valentine Roux cites other scholars that have argued that the structure and quality of the vessels are consistently the same when production is specialized (Roux 2003: 768). Therefore, it is possible that the ceramics were consistent in paste from the Intermediate Period to the Late Period at Gran Quivira if the ceramic production was intensified.

Furthermore, it is important to remember that older women may have helped relieve the extra burdens placed on Puebloan women during the Late Period. As mentioned earlier, it was speculated that they took on other household tasks when the younger women were forced to work more in the fields. By doing so, older women could have produced pottery themselves or allowed time for younger women to intensify the production of pottery for trade and local use.
Another explanation for the homogeneity in paste and temper from the Intermediate Period to the Late Period is that potters were too conservative to experiment with the clay preparation. Hagstrum (1985) explains that potters are often “‘conservative’” (1985: 69) in their craft and typically do not experiment outside of different tempers, clays, or styles when expediting ceramic production for mass production. Most of the time, women kept the raw materials like clay and temper in reserve for future use to avoid changes in the production method. A change in temper or clay would not only run the risk of ruining the vessels, but it would take precious time away from production just to experiment with the new materials (Hagstrum 1985: 69).

Conservatism of a potter could therefore explain the consistency in paste and tempers at Gran Quivira. Since the demand for ceramics increased during the Late Period, it would have been more conservative of the potters to avoid changing the temper or the clay in order to save time. It would also guarantee that their efforts and time put into the pottery were not wasted and that the ceramics were made properly for trade and use. Therefore, although the time constraints were clearly placed on the natives at the Salinas Province, and ceramic production, along with other labor, increased during the colonial period, it is possible that this ceramic production increase led to more standardization rather than less.

Finally, a possible reason there was no change in the temper and clay from the Intermediate to Late Period is because the Pueblo Indians were trying to maintain their identity through ceramic traditions. The ability to preserve their native identity served as a way to resist Spanish acculturation, and this resistance was practiced in different ways. When the Spanish friars tried to abolish Puebloan religions by razing kivas and
destroying idols, the natives responded by worshiping katchina gods in secret. Sometimes, Pueblo Indians even hid their religious symbols on ceramics as a way to continue their traditional native practices without being punished by the Spanish. Since the Spanish were often so determined to change the natives, it is possible that being forced to change a practice like ceramic production because of labor costs would be unthinkable to the Pueblo Indians who were trying to maintain their identity.

Effects of Household Re-organization and Food Availability on Jars

Analysis of the size and quantity of all jars from the Intermediate Period to the Late Period found that there was no significant change in the size of the jars. Scholars like Rice (1984) and Mills (1999) have suggested that vessel sizes can correlate with diet changes and either a lack of food availability or an introduction of new foods; however, the vessel sizes did not reflect these changes, nor did analysis find that the quantity of jars changed from one period to the next. Therefore, I conclude that the vessels were not changing as a result of household reorganization or because of famine. Presently, it is difficult to determine why the size of vessels did not change under apparent colonial and environmental pressures, but there are at least two possible explanations.

The first explanation is that the environmental pressures were not influential enough to change household organization or food consumption to see visible changes in jar sizes. The Jumanos Pueblo Indians were impacted by famine and disease by the early 1600s, but of the three pueblos in that region, Pueblo Blanco may have been the most protected from colonial pressures because the Spanish had less of an influence there. Pueblo Blanco was certainly impacted by the pressures since people living there became
dependent on maize as a famine food, but it was also a place of refuge for the other two Jumanos pueblos trying to escape the Spanish. Therefore, since pressures may have had less of an impact at Pueblo Blanco, it is possible vessel sizes were not significantly impacted.

The second possibility is that the site was abandoned before colonial and environmental pressures could be observed in the ceramic record. Mobility was a Puebloan strategy to counter environmental pressures, so it is possible that those living at Pueblo Blanco abandoned the pueblo village before the famine made a noticeable impact in the archaeological record.
CHAPTER 6

CONCLUSION

The ceramic analysis performed on Gran Quivira and Pueblo Blanco suggests that there were no significant technological changes when comparing the Intermediate Period and the Late Period in the plainware ceramics. Tempers and pastes changed little from the Intermediate Period to the Late Period despite pressures to expedite ceramic production and food availability, and household sizes seem to have no impact on jar sizes and quantities. Despite this observation, it does not mean that ceramics were never impacted by colonialism in the Southwest.

Across the Southwest, Puebloan ceramics have been known to change as a result of social pressures directly brought by the Spanish in the colonial period. Sometimes these changes were ideological while, at other times, these changes were practical in nature. For example, there are at least a couple of cases in which decorations on Pueblo ceramics changed for ideological reasons that could be tied to the Spanish presence and influences. One example came from the Salinas Province itself. Authors Katherine A. Spielmann, Jeanette L. Mobley-Tanaka, and James M. Potter found that glaze ware ceramics in the northern part of the Salinas province changed with the arrival of the Spanish. Previously, the glazeware in Salinas was polychrome with intricately painted designs, but from the 1620s to the 1670s, during Spanish occupation, the pottery lost the polychrome style, and the designs appeared to look more symbolic. The potters in the province also started using a runny glaze that appeared to hide the designs painted underneath. It seems that the potters were still able to use the same slips and clays
available before this time period; however, they were intentionally changing the ceramic production as a response to Spanish imposition (Spielmann et al. 2006: 361). Spielmann et al. believe that the switch to symbolic decorations and the use of runny glazes was a response to the Spanish friars’ attempts to squelch native religious practices (Spielmann et al. 2006: 362). Therefore, the Puebloan people at Salinas were hiding and disguising their rituals painted on the pottery in order to maintain their religious practices in secret.

This practice was not only performed by the Puebloan people at Salinas but probably by the natives living at Pecos as well. According to Spielmann et al., Kidder noticed that the designs on the glazeware at Pecos also appeared runny during the colonial period (Spielmann et al. 2006: 362). It seems that resistance in the form of hidden icons and change in ceramics was more visible in areas that were inhabited by the Spanish, but at places that were not as heavily occupied, native symbols were more prevalent and public. Gran Quivira and Pueblo Blanco, specifically, were able to display native designs and rituals in the public because the Spanish did not occupy the pueblos as frequently (Spielmann et al. 2006: 640). These two examples taken from Salinas and Pecos demonstrate how the Pueblo Indians transformed their pottery in order to hide their religious beliefs from the Spanish.

While these examples demonstrate changes directly related to social practices, technological changes in ceramics can occur from colonial influences as well. Dietary changes have reportedly made an impact on pueblo pottery. For example, Mills (1999) explains that the introduction of a new food like wheat can lead to new vessel forms and uses. Bread bowls, for example, were created as wheat was adopted by many of the Pueblo Indians. At pueblos where more crops were successfully adopted, archaeologists
also discovered that storage jars were more prominent because they were now storing Spanish foods like wheat, in addition to corn, beans, and squash. The archaeological record has also revealed that some Pueblo Indians adopted Spanish traits in their own pottery style and technology. This combination of both Pueblo Indian and Spanish styles in ceramics has been called Colono Wares and include changes in designs or vessel forms like pitchers that are more Spanish in nature (Dyer 2010).

Evidence, therefore, suggests that both decorative and utilitarian native vessels could be transformed because of colonial influences. Despite these examples, however, plainware ceramic technology at Gran Quivira and Pueblo Blanco appear to have remained unchanged from the Intermediate Period to the time the pueblos were abandoned in the Late Period. Such apparent consistency in vessel sizes in manufacturing techniques may be explained through ceramic intensification, potter conservatism, pottery idealism, and regional differences.

While I have attempted to provide explanations to the results of my research, this study only looked at ceramics at two pueblos in the Salinas Province that may not have been as significantly impacted by the Spanish as other pueblos in that province. Conducting the same research on plainware ceramics at pueblos that were more heavily occupied by the Spanish could yield different results in the pastes, tempers, and vessel forms. It is important to note that determined the use of specific vessel forms was difficult in this study because there were no whole vessels from the collection. Results could have been different if I were able to differentiate storage jars from cooking jars and made a proper comparison in sizes and quantities.
I would suggest that scholars continue to study the material culture as a way to answer further questions about cultural change in the face of contact. While it is important to study all aspects of the archaeological record, hopefully this paper has shown that even day-to-day materials like a cooking pot or a storage jar can help archaeologists pose and answer new questions about cultural change.

The goal of this project was to determine whether or not the interaction of cultures is reflected in the material culture, specifically, ceramic plainware. By exploring whether or not vessel forms, techniques, quantity, or size change in the period of occupation, I attempted to observe whether or not Puebloan culture prevailed or adapted to Spanish influences and pressures. Furthermore, by observing whether or not time constraints impacted ceramic production, we can understand how the Puebloan people accommodated for stress, colonial pressure, and the pressure of time allocation. By better understanding how a specific culture negotiates acculturation, we can better understand the mechanics behind how ideas, beliefs, and practices shift over time.
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2006-2007  Archaeology Dig Scholarship, Walla Walla University

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