Trauma and Violence: The Human Remains from Pecos Pueblo and Forked Lightning

Anthropology Departmental Honors

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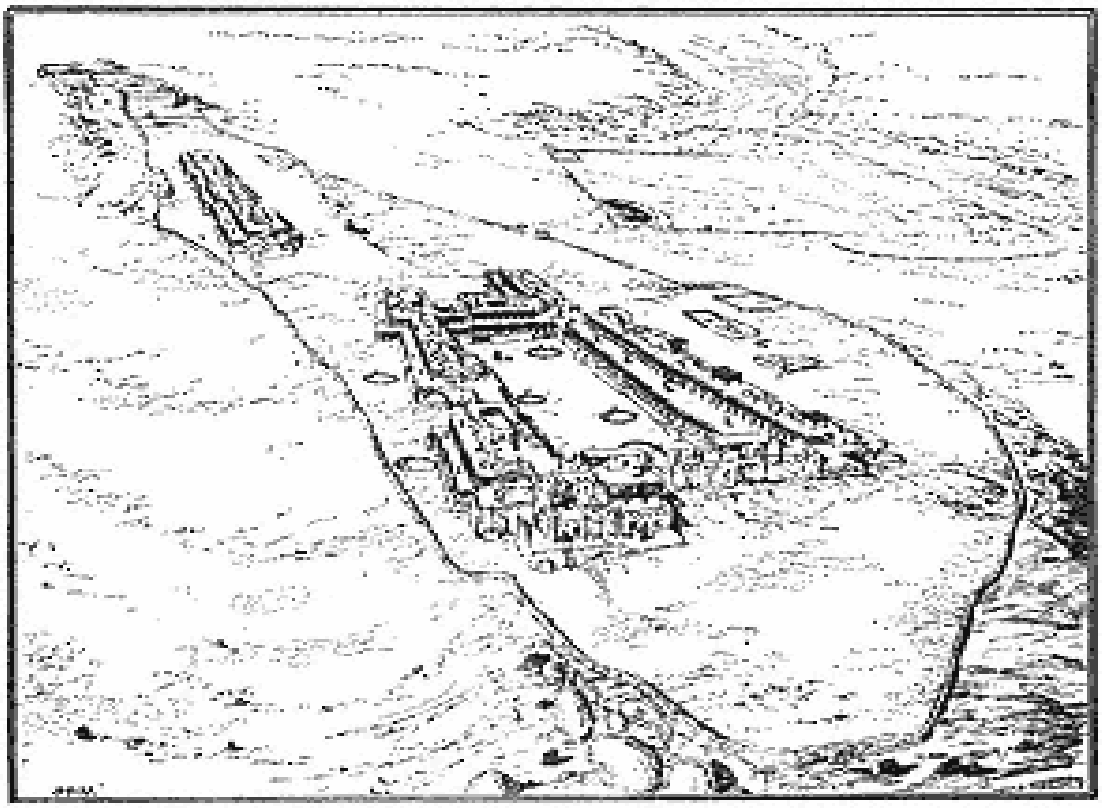

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Abstract: Pecos Pueblo, a Community situated in the Pecos River Valley, was inhabited AD 1325-1838. Forked Lightning, also situated in the Pecos River Valley, was inhabited from AD 1200-1425. Before the repatriation of the human remains of Pecos Pueblo and Forked Lightning to Jemez Pueblo, 1,127 individuals were reanalyzed for pathologies. This paper seeks to explore violence through time as indicated by the presence of trauma found on these human remains. Patterns of trauma seen on the individuals of Pecos Pueblo will be analyzed in the context of social interactions between Pecos Pueblo outside communities. I use recent research on violence in the past to interpret the Pecos data. In my analysis of the Human remains from Pecos, there is an increase of trauma after the Coalition period, during which both Pecos Pueblo and Forked Lightning were occupied. In the following period, the Classic period, trauma and violence at Pecos Pueblo remains constant until the Colonial period, the eighteenth century in particular, as seen in the church burial group, despite changes pathologies that indicate poor health.

Introduction

Steven LeBlanc uses bioarchaeology, the study of human remains, to tackle the topic of the change of violence through time in the prehistoric American Southwest in his book *Prehistoric Warfare in the American Southwest* (1999). Bioarchaeology can be used to create a narrative of violence through physical context: an arrow point found in vertebrae can be undoubtedly attributed to some sort of conflict. In a sense, bones don't lie: they allow physical realities to be told in an unbiased and objective manner. How individual remains are interpreted within a cultural framework, however, ironically adds a human context to physical remains. A richness is added; as the interworking's of a culture and interactions with outside groups begin to surface. Broadly speaking, this paper is a study of violence in the prehistoric and historic Southwest. I will explore the changes in the prevalance of violence through time at Pecos Pueblo and Forked Lightning Ruin in the context of social interactions and the patterning of violence through the analysis of bioachaeology presented in *Pecos Pueblo Revisited: The Biological and Social Context* (Morgan, 2010). Analysis of human remains from Pecos Pueblo and Forked Lighting allows for a better understanding of recorded, as well as non-recorded history of violence in the American Southwest. Bioarchaeology has seldom been used to assess violence in the historic period in the Southwest. The incorporation of bioachaeology in the historic period is one objective of this paper.

Pecos Pueblo was a Southwestern town that was inhabited from 1325-1838 A.D. Forked Lightning, a small pueblo one half a mile southwest of Pecos Pueblo, was occupied between 1200 and 1425 A.D. When the site was abandoned, its inhabitants migrated to Pecos Pueblo. At the time of first contact in the 16th century, Pecos Pueblo housed around 2,000 occupants (Levine, 1999). Situated in the Pecos River Valley, just 30 miles away from Santa Fe, the

pueblo was strategically placed on the boundary between the Southwest and the Great Plains. Pecos Pueblo was at the center of Southwest and Plains interaction throughout its entire occupation. In the late period of occupation, the pueblo became a target of raids by the Comanche and the Apache. Pecos Pueblo was one of the first towns in the Southwest contacted by the Spanish, as Coronando led his expedition to the pueblo. After initial Spanish contact, Pecos became subject to Spanish authority and missionization.

My research is focused on the published findings of the human remains found at Pecos Pueblo and Forked Lighting in *Pecos Pueblo Revisited: The Biological and Social Context* (Morgan, 2010). I entered the information of 1,127 individual remains presented by Morgan (2010) into a data base that I could then use to analyze the patterning of trauma and violence through time at Pecos Pueblo and Forked Lightning. Individuals belonging to the Coalition, Classic, Transitional, and Colonial periods, spanning 600 years, were analyzed. Before I present the data that I collected from Morgan (2010) I will first give a history of Pecos Pueblo and a detailed narrative of the interaction of Pecos Pueblo with outside groups. My hope is to create a rich cultural context to later add to my analysis of trauma. Then I will describe how violence manifests itself in an archaeological context. I will be examining what violence looks like on human remains, as well as different contexts of violence that affect individuals and communities. I will use this information on the patterning of violence to apply to the Pecos data in later sections of this thesis.

Next, I will assess the patterning of trauma through time using my analysis of data collected Morgan (2010). Broadly speaking, my research found a low level of trauma and violence in the early occupation of Pecos Pueblo and Forked Lighting, during the Coalition Period. However, I found a steady presence of trauma at Pecos Pueblo from the Classic period of

occupation until the 1700's. Interestingly, more males show trauma then females throughout the entire occupation of Forked Lighting and Pecos Pueblo. There is a marked increase in trauma that can be directly related to violence in the burial sample from the 4th mission church at Pecos Pueblo, as seen through an increase of head trauma and perimortem trauma (trauma inflicted around the time of death). Head trauma implies violence more than any other type of trauma on the body, while perimortem trauma is also indicative of violence. Reasons for the increase in perimortem trauma and head trauma in the church burial sample can be explained by violence related to warfare and captive taking among Pecos, the Comanche, and Apache.

Morgan (2010) comes to many of the same conclusions in her volume that I noticed in my analysis. In her publication, it is stated that 15% of the entire collection have bone trauma. The ratio of postcranial vs. cranial trauma for the collection is about 2:1 (Morgan, 2010; 36). However, Morgan argues that there is an increase of head trauma through time at Pecos Pueblo (2010; 36-37). Through this is seemingly true, the percentage increase is not big enough to show a marked increase of head trauma over time, until the 1700's. I found that head trauma remained relatively the same through all the time periods, with the church burial group as an exception. Morgan also attributed an increase in violence seen in the church group to raids by the Comanche and Apache, and possible social conflict in the wake of the Pueblo Revolt. My findings, however, indicate that the movement of the Comanche onto the Western Plains in the early 18th century is the paramount reason for this increase in trauma. There is little else said about the occurrence of trauma, and its specific locations in a temporal context in Morgan's (2010) publication.

Pecos Pueblo and the Surrounding Pueblos

The Pecos River Valley lies 35 miles northeast of Santa Fe, New Mexico. The Pecos River begins its journey downstream from the Sangre de Cristo Mountains, and eventually meanders its way through the valley. The Pecos River Valley receives an average of 15.6 inches of precipitation a year (Levine, 1999). The river, however, allows for maize farming on its arable banks. Maize was a staple of the Southwest during prehistoric and postcolonial times, as it constituted 65-80 percent of the total indigenous diet (Snow, 1991; 72). Because of the high elevation of the valley (around 6000 ft), the growing season is short. This is problematic, as one out of every three years the 120 frost-free days needed to grow corn are not met. Due to this variability in climate, the residents of Pecos never grew corn intensively like their neighbors. For example, San Marcos Pueblo built several more fixtures for agriculture infrastructure than the people of Pecos (Welker, 1997). Still, there are a wide variety of resources in the area, and plants and animals in the drainage provide a rich array of food throughout the year (Levine, 1999). The forests that surround the drainage offer water, fish, game and resources such as wood and stone the natives used in their everyday lives (Welker, 1997; 45).

The valley is home to six small Pueblo III and IV communities. All of these sites are situated within a few miles of one another. Dicks Ruin, Forked Lightning, Black on White House (the lower levels of Pecos Pueblo), Loma Lothrop, and the lower levels of Rowe are all Pueblo III sites. These sites were typically one story pueblos with interconnections between the kivas and rooms, as exemplified in Forked Lightning (Schroeder, 1979; 430). These sites are important to the dramatic changes in the Southwest during the transition from Pueblo III to Pueblo IV periods, also known as the Coalition Period. Lipe argues for the migration of a significant number of people from the Mesa Verde Region into the Northern Rio Grande, some

of whom may have settled at the sites in the Pecos River Valley (2010). Earlier, Kidder and Nordby (Levine, 1999) had suggested immigration as the reason for the growth at Pecos Pueblo. However, Linda Cordell found no material evidence of immigrants from the Mesa Verde Region coming into Rowe pueblo during this time (1998;87).

Pecos Pueblo, the largest of these communities, was occupied from AD 1200-1838 (Welker, 1997) and turned into a stronghold of the area around 1425, as the majority of the population of the Upper Pecos Valley aggregated there (Levine, 1999). Aggregation at Pecos Pueblo was likely the reason for the abandonment of Forked Lightning. This is exemplified in the lack of burials found after the Coalition period in the Forked Lightning data set and an increase of burials at Pecos in following periods. Pecos was a plaza oriented community that covered 11 acres. Kidder suggested that 660-800 rooms were added during AD 1425-1490, the Glaze 3 ceramic stage, and became the pueblo it was historically known as (Levine, 1999;9; Schroeder, 1979; 430). Pecos eventually became a force in the Southwest due in part to its large population and the sheer size of the structure. The Spanish record keeper during Coronando's expedition, Pedro de Castañeda, described Pecos Pueblo as "A very strong village four stories high, a village of nearly 500 warriors, who are feared throughout that country" (Hooton, 1930;3). Castañedas continued in his description of the Pueblo:

> "(Pecos Pueblo) is a square, situated on a rock, with a large courtyard in the middle, containing the estufas. The houses are all alike, four stories high. One can go over the top of the whole village without there being a street to hinder. There are corridors going all around it at the first two stories, by which one can go around the whole village. These are like outside balconies and they are able to protect themselves under these... The people of this village boast that no one has been able

to conquer them and that they conquer whatever villages they wish" (Hooton, 1930;3-4).

Situated on the boundary between the Southwest and the Great Plains, Pecos Pueblo acted as a liaison for trade between pueblo groups and plains tribes. Artifacts from plains tribes are evident archaeologically during the Pueblo IV Period, and become ubiquitous from that point on (Kidder, 1932; 3). Relationships with Plains tribes changed over time, however, as Pecos fell victim to a series of raids orchestrated by the Apache and the Comanche between 1730 and 1838, when the last residents of Pecos left (Levine and Labauve, 1997;96). Both trade and violent conflict between Pecos and other groups will be discussed further in following sections, as violent contact with outside groups is evident in the human remains that are the subject of this thesis.

In 1540 Francisco Vasquez de Coronado was the first European explorer to make his way to Pecos Pueblo, in search of the seven cities of Cibola. He was not well received. Pecos occupants instructed a captive for a Plains tribe, whom the Spanish called the Turk, to take Coronado and his army on a wild goose chase into the plains (Hooton, 1930;4). When Coronado returned, he staged assaults on Pecos as well as the other pueblo communities in the Southwest (Levine, 1999:14).

Because of Coronado's reports of Southwest as barren in terms of gold, The Spanish did not return to the region for the next forty years. In 1598, Juan De Orñate was granted permission to colonize New Mexico and brought a large number of Spanish colonists to the region (Levine, 1999;14-15). As a result, Pecos became subject to Spanish intervention in the form of colonization, missionization, and disease that would change the economic and social systems of

the Pueblo world over the next century. Pecos inhabitants also started growing domestic crops and raising animals that the Spanish brought over (Schroeder, 1979; 432).

Missionization from the early 1600's to the pueblo's abandonment had a significant effect on the Pueblo, as four churches came to be housed within the boundaries of the settlement during the Colonial occupation. The Pecos' first church, which was located northeast of the pueblo, was thought to have been built before the 1620's (Morgan, 2010;129). Pecos' 2nd church would be destroyed in the Pueblo Revolt in 1680. Years of famine, population decline, and Spanish abuse resulted in the Pueblo Revolt, and offered a short emancipation from Spanish rule (Levine, 1999, 21). After the Spanish regained control over Pecos in 1692, the 3rd church was built next to the remains of the 2nd church. Just ten years later, the 4th and final mission church was built at Pecos. The 4th church was built on top of the 3rd church and the rubble from the second (Morgan, 2010; 129). Although time has taken a toll on the last mission church, segments of it still stand today. The individuals found buried within the walls of this 4th church will be discussed later, as a high percentage of them contain trauma from acts of violence.

The 18th century was characterized by a number of outside forces that aided in the slow collapse of Pecos Pueblo. Apache and Comanche raids on the pueblo took a toll on the pueblo's resource inventory and population. However, disease was the primary force that decimated the population. A series of major epidemics swept through the pueblo, at least one per decade, taking a number of lives. To name just one, an unspecified epidemic swept through the Southwest in 1748 that left at least 15 children dead at Pecos alone (Kessell, 1979; 378). As the population declined more and more, outbreaks took an even greater toll on the pueblo. By 1838, a mere twenty Pecos residents were left. They moved to Jemez Pueblo, where their kin still live today.

Excavations at Pecos Pueblo

Adolph F. Bandelier was the first to describe Pecos Pueblo in 1881. Alfred V. Kidder was the first to direct excavations at the pueblo between 1915 and 1929. His work at Pecos would make the pueblo famous, as the name was used for his construction of the Pecos Classification System and the Annual Pecos Conference of Southwest Archaeology. Earnest A. Hooton was the first to conduct research on the skeletal remains from Pecos Pueblo in 1930. During which time, the remains from the pueblo were transported to the Peabody Museum of Archaeology and Ethnology at Harvard University in Cambridge, Massachusetts. The museum housed the remains of the 1,127 individuals from the Pecos River Valley, and primarily Pecos Pueblo, until the repatriation in 1999 of these remains to the current descendants of Pecos Pueblo who now live at Jemez Pueblo. A reanalysis of all the individuals was conducted under the guidance of Michele E. Morgan, the Peabody Museum's repatriation staff osteologist, before they were rightfully returned. My research is focused on the reanalysis of those individuals provided for me by Morgan (2010). All the data for my project has been taken from the published findings of that reanalysis in *Pecos Pueblo Revisited: The Biological and Social Context* (Morgan, 2010).

Pecos Pueblo interactions with "the other"

Due to the unpredictable growing seasons in the Pecos River Valley, the inhabitants of Pecos Pueblo needed a trade network to ensure their survival. The material evidence for external trade is evident archaeologically at Pecos. The pueblo contained a wealth of exotic artifacts, bison bone, lithics made of Alibates, and imported pottery (Welker, 1997; 54). The history of the interactions between the pueblo and particular groups can help explain the evidence of

trauma on human remains found at the site. Alternatively, analysis of trauma on Pecos human remains may also allow a deeper insight into relationships with outside groups. My hope for this section of the paper is to create a rich cultural context that will help explain the patterns of trauma evident in the Pecos data. Alfred Kidder stated; "warfare was probably intermittent, trade with the enemy going on more or less continuously" (1932; 3).

In the period of occupation of Forked Lightning and early Pecos settlement (before 1450), there were no specialized hunting populations on the southern Plains (Snow, 1991; 71). This period (including the Coalition and Classic Period) seemed to have been a time of peaceful interactions with plains groups living around the Texas Panhandle of the Antelope Creek phase. People of the Antelope Creek Phase (1200-1500), lived in semi-permanent villages of semi-subterranean structures, made cord marked pottery, and based their subsistence equally on bison hunting and horticulture (Bamforth, 2012; Lintz, 1991;90). Artifacts found at Eastern pueblo sites that are attributed to interaction with Antelope Creek people include Alibates agate, bone tools, and cordmarked pottery (Morgan, 2010:22, Lentz, 1991; 94). Puebloan materials present at Antelope Creek sites include ceramics, exotic materials, pipes, obsidian, and jewelry (Lentz; 1991;95). It is argued the two different groups became enmeshed in trade in part because the population increase the in Rio Grande Valley strained resources in the area (Pecos, 2006). Bamforth (2012) argues that the Antelope Creek phase took part in intensive butchering and processing of Bison, presumably for trade. Assuming this is the case, Antelope Creek most likely traded bison resources with Southwest pueblos, including Pecos. The appearance of a new bow technology, the recurved bow, during this time created a necessity for stronger shields. LeBlanc argues that plains tribes were trading shields made of bison hide at this time, more so than any other bison resource (1999, 298). There is no evidence of any type of violent contact

amongst these two groups during this time of early Plains trade, although Antelope Creek Sites were subject to violence by other outside groups (Lintz, 1991;103). By around 1500 Antelope Creek people abandoned their villages, most likely moving east to consolidate with other groups there. Their departure may have been due to climatic change or the movement of Athabaskan speaking groups into this area, forcing them out (Lentz, 1991; 104, Baugh, 1991;122).

Despite apparently friendly interactions between Pueblo and Plains groups, the changes that took place at Pecos Pueblo during this time were indicative of conflict. During the glaze III period (1425-1490) the population of the Pecos River Valley aggregated into Pecos pueblo. Alfred Kidder writes; "there began to be developed more compact three and four storied style of pueblo… At about the same time was built the first of several defensive walls which from then on surrounded the village" (Kidder, 1932; 3). Compact fixtures and defensive walls protect against violence and intrusion. Ironically, the intruders were most likely warriors from the surrounding pueblo communities. Steve Lekson (2002, 613) characterizes the conflict that arose during this period as institutional conflict that occurred between multiple villages. This is apparent in the no man lands between pueblos, which added the extra cushion of space between enemy pueblos. Before their conquest of New Mexico, the Spanish learned of an infamous conflict amongst pueblo villages (Gunnerson, 1974;7). Historical evidence of this pre-Colonial aggression is apparent in the fact that the Spanish took advantage of the competition between Taos, Picturĩs, Pecos and other pueblos to gain the upper hand in Plains trade. Given this historical evidence, it is possible that conflict could have arisen over trade with Antelope Creek. Ironically, Pecos also engaged in frequent trade with other pueblos. In a common 'raid and trade' scenario, these groups most likely put a temporary end to violence to facilitate trade (Leblanc, 1999;299-300).

The 16th century marks a period of great change in the Southwest and radical change for the inhabitants of Pecos Pueblo. These changes stem from the movement of Apaches onto the Southeastern Plains, and first contact with the Western world. The Apache were composed of a number of separate tribes that speak an Athabaskan language that has its origins in Northwest Canada and Alaska. It's uncertain when the Apache first came into contact with the Pueblo Southwest, but the majority of scholars would argue for their arrival around 1525 AD (Gunnerson, 1974; 5). Early Spanish explorers described the Apache as nomads who harnessed dogs with packs and sleds (Hammond, 1940; 262). When the Spanish arrived at Pecos, Castaneda reported the Apache camped outside the pueblo for winter trade (Spielmann, 1991; 7). The residents of Pecos also told the Spanish a story in which the Eastern Apache decimated villages and tried to take over Pecos as well, but later become friends (Hammond, 1940; 258). This story characterizes Apache contact with pueblo communities, as their relationship of trade and raids would always be complicated (Cordell, 2012; 282). After contact, the Apaches quickly integrated horses into their nomadic lifestyle. The introduction of new mode of travel facilitated Apache raids on pueblo communities.

The presence of Spanish in the southwest shook the region with monstrous force: things would never be the same. Spanish diseases were the primary reason for the population at Pecos of over 2000 to decline to a mere 20 residents at the time of the pueblo's abandonment. The material items the Spanish introduced to the Southwest would change the minutest aspects of daily life. The Spanish brought horses, cattle, sheep, goats, and pigs, and Southwest communities incorporated raising domestic livestock into their subsistence practices (Cordell, 2012; 279-280). Horses created a drastic shift, as nomads swept into the plains and started to live a fast-paced hunting and gathering lifestyle. During his excavations at Pecos, Alfred Kidder

found abundant evidence of Spanish presence at Pecos, including a wide array of metal artifacts, domesticated animal bones, and china. Arrowheads forged from sheet metal found at Pecos suggest the violent changes that occurred (Kidder, 1932; 305-308).

Although their arrival to the southwest was 150 years after that of the Spanish and Apache, one cannot speak of conflict at Pecos Pueblo without mentioning the Comanche. In his 1952 book, Ern Wallace called the Comanche the "lords of the Southern Plains". Others have called them the "Spartans of the Plains". The Comanche were idealized savages that had a reputation as excellent horseman and ruthless raiders of pueblo communities. In fact, Wallace attributed the fall of Pecos that to the destructive hand of the Comanche (Wallace, 1952; 3). The Comanche's are a Shoshonean group that migrated to the southwest around 1700. Because of their late separation from the Shoshonean, the Comanche's had an almost identical language and culture as the Shoshone in historic times. Upon their arrival, the Spanish, Apaches, and Pecos frequently found themselves allied against Comanche attacks. However, the Comanche also engaged in trade with both Spanish and Pueblo groups at Pecos, thus creating complicated relationships built on dependency and fear (Levine, 1991;Baugh, 1991). The Comanche were intensive bison hunters that were heavily reliant on bison for food and trade. Undoubtedly, the availability of the horse made this lifestyle efficient and desirable. Human trade was also a main element of Comanche trade, as they raided for and traded captives (Brooks, 2002).

Raids on Pecos at the hands of the Comanche and Apache were a common occurrence from the last part of the 17th century until the Pueblo's abandonment in 1838. Raids were very damaging to the pueblo, in part because the Pueblo's population was in decline; they didn't have enough warriors to protect against outside harm (Kessell, 1979; 359). Plains tribes took advantage of Pecos' weakness. In a Spanish account of a campaign against the Apache, General

Hurtado writes: “The people of these pueblos frequently pursued the Faraones (Apaches) to retrieve their stolen horses, women, and children” (Thomas, 1935: 24). Diego De Penalosa, once governor of New Mexico wrote: “They attack the Indian pueblos from previously prepared ambushes and kill the men atrociously and carry off the women and children as legitimate captives of war. They usually destroy their enemy’s corn fields.” (Gunnerson, 1974;109) From these accounts, patterns start to emerge of what raids looked like. Not only were Plains groups pillaging resources, but they were commonly capturing women and children as well. The majority of the information on raids within Pecos Pueblo is found in the sacramental books of the mission church. There were 36 recorded raids between 1697 and 1829 (Levine, 1999:66). Authors have suggested that raids typically occurred during years of drought and low crop yield on the Plains (Kessell, 1979:212-221). Levine argues the opposite, that raids took place during years of abundant rainfall as well (1999:70). Thus, violence through raids was always an imminent threat for those at Pecos Pueblo.

Trends of who lead the raids against Pecos changes through time, which is symbolic of the complex and ever changing alliances and rivalries between Pecos, the Comanche, Apache, and the Spanish after the late 1600’s. The Apache are the only identified intruders on record between 1697 and 1728. During the first episodes of conflict, the Apache attacked Pecos seasonally between the months of March and September (Levine, 1999:67). The raids were most likely seasonal, excluding winter months, so the Apache could engage in winter trade with Pecos, which is evident in early Spanish documents (Gunnerson, 1974; 88). Even in times of peace with pueblo tribes, the Apache were still a threat. In the opinion of Fray Francisco de Ayeta, the mission priest at Pecos in the late 17th century, Pueblo tribes were virtually the slaves

of the Apache and were fearful of their own lives if the Spanish were to depart (Gunnerson, 1974).

Between 1739-1786 Pecos suffered a severe disruption by the Comanche (Levine, 1999). Kessell cites the reasons for this disruption as the Comanche preference of Taos Pueblo for trade, warfare with Pecos, and the Comanche's diminishing effect on the Apache, Pecos' primary Plains trade liaison (1979; 369-370). In 1746, there are records of Comanche attacks at Pecos that killed 12 people, including two women, and three children. In another attack against Pecos in 1748, 13 men were killed and buried in the Pecos church. Although the numbers are a bit exaggerated, a Spanish office holder claimed the Comanche killed 150 Pecos Indians between 1743 and 1749 (Kessell, 1979). The number of the Comanche involved in the attacks presented a reality that Pecos had a hard time keeping up with. At times, the Comanche would attack the pueblo with a warrior population 1/3 the size of the entire population of Pecos (Levine, 1999; Kessell, 1979). During this time, residents of Pecos, the Spanish, and the Apache were in somewhat of a united front against the Comanche. Comanche attacks came forcefully and suddenly to the residents at Pecos, as some died tending to crops and livestock just outside the pueblo. In 1786, the Comanche finally decided to sign and abide by a peace treaty that included the Utes, Jicarillas, and Navajos (Gunnerson, 1974; 267). Other Apache groups were left out of the treaty, as the Comanche claimed they still needed some form of conflict (Kessell, 1979; 410). From that point on the Comanche engaged in peaceful trade with the residents at Pecos.

At this point in time, the pendulum of conflict turned and Pecos saw episodes of violence, once again, at the hands of the Apache. Between 1790 and 1824, Gunnerson argues that a different group of Apache (the Faraon and Gila Apaches) were involved in conflict with Pecos rather than the Jicarilla Apache. Although this might be the case, the Apache groups (mainly the

Jicarilla) that were once present in the baptismal and burial records at Pecos during times of conflict with the Comanche, disappear completely from these books (Levine, 1991). Violence with the Apache came in sporadic bursts as seven raids were attributed to the Apache during that time. Eleven deaths at Pecos were attributed to these raids (Levine, 1991; 68).

The conflict was not a one way street however, as historical documents indicate that Pecos held and traded captives as well (Hooton, 1930, Thomas, 1935, Levine 1999). During the historic period in the Southwest, slave trade was ubiquitous. It's estimated that in 1776, 1/3 of the indigenous population in New Mexico were slaves (Cordell, 2012; 299). Pecos was the location of many fairs, in part because of its ideal location. At these fairs, Native groups and the Spanish would take part trading of various supplies such as weapons, tools, hides, and food as well as slaves (Levine, 1991; 156). In one incidence, an Apache group that included men, women, and children came to trade at Pecos. Instead of the trade they sought, the Apache were taken as slaves and separated; some going to Spanish silver mines and others sold elsewhere (Kessell, 1979; 363). Oftentimes, slaves that were taken were baptized and given the surname of the slave holder, as they acted as the godparent. For instance, in the baptismal records at Pecos, five Apache children with Hispanic and Pecos godparents are arguably slaves (Levine, 1991; 85). In the later history of Pecos (1810- abandonment) the overwhelming majority of captives at Pecos were Navajos.

The consideration of slaves is important in assessing the trauma at Pecos because slaves could have been subject to intense acts of violence, which will be discussed later. The manner in which they were treated in historical context can give clues as to how certain populations might be located in the bioachaeological context at Pecos. In His book *Kiva, Cross, and Crown,* John Kessell writes:

> "(The slaves) were children or young women, for their men died fighting, were put to death, or were too tough to "domesticate". No Hispano of New Mexico, however lowly his station, felt that he made good until he had one or more of these children to train as servants in his home and give his name. Men wanted to present them to their brides as wedding gifts. They were as sure a symbol of status as a fine horse" (1979; 336).

A number of cultural implications can be gained by this quote. The fact that men wanted to eventually give captive children their name most likely means that they wanted to incorporate slaves into their culture. This also implies that slaves could most likely marry into the culture in which they were held captive. As a result of the societal integration of slaves in Southwest culture at that time, it is safe to say they were not treated with complete disregard.

Although Pecos Pueblo and other sites of the river valley saw their fair share of violence during the Prehistoric period, the historic period in the pueblo is undoubtedly more dramatic. The arrival of the Spanish, Apache, and Comanche brought various tides of disruption to pueblo communities. All these interactions created the perfect storm for dramatic, complicated, and violent relationships. It is important to take note of the "wild west" aesthetic of this period of time, as the trauma found in the data at Pecos Pueblo can be explained though these relationships.

A Discussion of Trauma

In the most basic sense, identifying trauma puts a name to the pain and suffering individuals endured in their lives. The patterning trauma over time is insightful into recognizing everyday hazards that were involved in a particular lifestyle. This, in turn, allows for a deeper

understanding of a particular culture. For example, multiple individuals containing the same trauma over time can be the result of the same occupational hazards. Individuals from two British Medieval communities showed a patterning of fractures of the forearm and lower leg due to hazards associated with a farming lifestyle, such as falling from wagons, falling on tough terrain, and dealing with large animals (Judd , 1999). An analysis of trauma can also illuminate disparities in a burial population. Men notoriously obtain more trauma in their lives than females because they tend to engage in more risky occupations and activities (Slaus, Novak, Bedic, and Strinovic, 2012; Walker, 1997; 158). For example, disparities of trauma between men and women in a local population might result from the presence of warriors, or individuals of another violent occupation. When Females exhibit more trauma than men, it might imply a social mechanism that is out of the norm. Debra Martin found a population of women at the La Plata site that exhibited more trauma than the males present. Because this finding was outside of the norm, along with many other factors, Martin argued that the trauma was an indication that women were captives (2008).

Markers of violence

To make sense of injury, archaeologists have collected data on the physical effects of violence today. In his quest to find contemporary patterns in social violence, Phillip Walker states: "different types of violent behavior produce characteristic patterns of skeletal injuries. Analysis of these patterns in modern and ancient populations can thus provide information on the historical, cultural, and environmental factors associated with different types of aggressive behavior" (146). According to JP Sheperd, the most common injury resulting from assault in Britain is to the head (1990). Inflicting injury on the head is strategic and symbolic, because it inflicts a serious amount of pain and is highly visible (Walker, 1997:160). Furthermore, the

majority of the injuries women sustain from domestic violence are to the head (Shepard, 1988; 234).

The patterning of head injury can be easily transferred to bioachaeology because it is easily identifiable. For example, depression fractures show up on the cranium from a serious blow (Martin, 2010). Attempting to fight back or flee shows up as fractures to areas of the face and nose (Martin, 1997). Scalping marks on the skull are indicative of intergroup conflict (Kendell, 2011). Because particular skull trauma is indicative of violence, archaeologists can therefore relate head injury directly to violence more so than any other location on the body.

Post cranial trauma is another indication of violence, and the presence of "parry" fractures, in particular. A midshaft fracture to the radius or ulna, a parry fracture, is typically caused by using the arm as a "blocking arm" in defense against blows to the face (Smith, 1996). Parry fractures are not used as a sole identifier of violence, because they can also happen in non-violent circumstances. However, the presence of a parry fracture strengthens the case for violence if it co-occurs with another violent trauma (ie. Cranial fractures) (Walker, 2001). Other trauma to bones can be indicative of violence in this same manner. If a fractured rib co-occurs with a cranial depression fracture, there's a high chance it will be identified as violence. If a fractured rib is not accompanied by any other indicator of violence, then it might be interpreted as an accidental injury. Healed injuries, such as repeated injuries to the head, or any other part of the body, can indicate multiple episodes of violence, which suggests violence as a result of domestic and social situations. This interpretation can be problematic however. It is best to look at the entire pattern of trauma, as well as the context in which a person was found before assuming that violence is the sole cause of fractures found. On the other end of the spectrum,

violence and trauma don't always show up on bones. In his sample of the UK, Sheperd found that 66% of female injury due to assault did not result in bone injury (1990).

Patterning of violence

Once trauma can be interpreted as violence, particular contexts in which the violence occurred can be inferred. These situations include the presence of continual warfare, a single episode of violence (such as a massacre or mutiny), and isolated incidents of violence, whether a form of interpersonal violence or a way to enforce control. Violence caused by captive taking and slavery would also fall under the umbrella of isolated violence. Each case of violence is indicative of a social issue. A modern day example is the high rates of sexual violence in the female African American community. Every woman of color that is subject sexual violence is an isolated incidence. However, Kimberle Crenshaw describes the high frequency rates of sexual violence against women of color as a symptom of intersectional subordination (1997; 487). Several types of activities that result in violence are discussed below and the markers of trauma for these activities are outlined. Then, these markers will be used to assess the trauma found with the Burial populations at Pecos Pueblo and Forked Lightning.

Continual warfare

The presence of continual warfare and raids was a reality for Pecos Pueblo throughout its entire occupation. Defining what characterizes the material record of warfare will add context to the violence seen at Pecos Pueblo. The time of clear institutional warfare in the prehistoric Southwest occurs during the Pueblo III and IV Periods. Sequential site processes found in archaeology, such as coalescence into larger settlements, the rapid construction of these larger settlements, defensive structures, and the abandonment of smaller sites (Leblanc, 1999). Sand

Canyon Pueblo, the largest pueblo community in the Mesa Verde Region during the Pueblo III Period was entirely enclosed by defensive walls. The site also contained multiple towers, which are also thought to be defensive structures (Kuckelman, 2010;44). The famous cliff dwellings in the Mesa Verde region during the Pueblo III period are also the result of aggregation and defensive building (Leblanc, 1999; 238). The markers of violence on human remains, mentioned above, should be present in multiple burial populations through a long time span at a particular site in order to attribute trauma to sustained warfare.

Single episode of violence

A single episode of violence is most easily identified as a massacre. This form of violence has an archaeological signature that can be exemplified in the high rates of preimortem trauma (sometimes in the form of mutilation), a number of people killed, and postmortem neglect (no proper burials). Violence typically happens at an occupation site and structures might be burned, and everyday house hold items left as they were last used. The massacre at Castle rock Pueblo during the Pueblo III period in the Mesa Verde Region is a textbook example of what the bioarchaeology of a single episode of violence looks like. In the assemblage of remains at the site, an estimated 41 people of all age groups were killed. The bones showed signs of trauma, disarticulation, carnivore activity, and wear from being exposed to the elements (Lightfoot and Kuckelman, 2001). Individuals at Crow Creek in South Dakota contain the same signatures on their remains; trauma in the form of depression fractures, breakage of teeth at gum line, scalp marks, and mutilation. Even though all the individuals were eventually entered into a mass grave, gnawing carnivore marks indicate initial postmortem neglect. Every demographic is represented within the Crow Creek, excluding young females (Bamforth, 1994; 107) which may

attributed to captive taking (DeBoer, 2008). It should be noted, the violence marked a sudden end of habitation at both Crow Creek and Castle Rock Pueblo.

A massacre at the Sacred Ridge site (During the Pueblo I period) in the Durango area has an assemblage of mutilated bodies with no postmortem care. Sections of the site also contain archaeological clues to a hasty abandonment, or none at all, found in association with burned or dismantled structures (Potter, 2010). However, other clues found in the archaeology infer a potential mutiny against a ruling class. For instance, most of the human remains were found in unique structures in the village that contained a wealth of exotic goods and large game remains, which points to a lush lifestyle (Potter, 2010). Single episodes of conflict are devastating in nature, whether the violence is inflected by outside groups or the result of inner community turmoil. In turn, the archaeological indicators that point to the destruction of a group in their home are unmistakable in appearance.

Isolated incidences of violence

Violence can be an isolated incident, for example, interpersonal violence. Interpersonal violence can take the form of domestic abuse, or assault against another community member. Interpersonal violence takes place for a multitude of reasons, however, there are social and cultural patterns to such acts of violence. For instance, the location of injury varies culturally. In his work on violence, Phillip Walker noticed that instead of the face as a place to injure, the Indians of the Santa Barbra Channel area preferred to inflict injury on the top of the head (1997, 166). In a study done on assaults in Scotland, a broken glass bottle was used in 15% of all attacks involving a weapon (Wright, 1997), which indicates a bar or drinking scene to be the setting of an attack.

Isolated incidences of violence can also be the manifestation of social powers at work. Take for instance, the isolated incidences of extreme processing during the Pueblo II period in the Southwest. The Pueblo II period is considered a peaceful time, as there is a lack of archaeological evidence of warfare. However, the period is marked by the rise of Chaco, debatably the most culturally complex system in southwest history. An unburied adult found at site 499 in the Mesa Verde Region with a severely twisted neck (Lister, 1964), a man and child found with no burial and missing body parts near Teec Nos Pos Great House (Turner, 1989) are a couple of many isolated acts of violence at this time. The majority of these processing events happened in communities associated with great houses, which were major cultural centers at the time. Patterns of these events include poor treatment at the time of death or after, mutilation, cannibalism, and postmortem neglect (LeBlanc, 1999). LeBlanc argues that the presence of single cases of mutilation, processing, and cannibalism with a lack of burial throughout the region was an act of terrorism on part of the elites at Chaco as a form of social control (1999). LeBlanc continues in his description of these events by saying: "as individual examples they are not very convincing as instances of deliberate acts, but they become interpretable as part of a much larger pattern" (166). Thus, isolated events of violence lack meaning when they are looked at out of a social context. Placing them in a larger social and temporal context, however, allows us to identify patterns in the prehistoric occurrence of these events.

Captives and Slaves

Cameron (2011) describes captive taking as something that every society in every part of the world has done. The Southwest is no exception. The trade and bartering of slaves as a commodity was well documented in the historic southwest. The treatment of slaves and captives, however, is something that changes culturally. In his recorded biography, Plenty

Coups, Chief of the Crow Indians, recalls women captured from enemy tribes being integrated into Crow society (Linderman, 1930). When Pecos Pueblo was involved in slave trade, slaves were baptized into the slave holder's family (Levine, 1999). Because captives often are integrated into their captor's society, they can be difficult to identify in the archaeological record.

One important indicator of captive taking in non-state societies is an increase or decrease of children and women, particularly women of childbearing age, in the burial population at a site (DeBoer, 2008; 240). Women and children are considered an asset to the feuding group, whereas men are typically killed because they are a threat (Keeley, 1996; 86). A site where there is a deficit of women or children is an indicator of the "losing" group, whereas a wealth of children and women is a signal of the victorious group. For example, the low number of young women in the burial population of the Crow Creek Massacre indicates that women were most likely taken as captives (DeBoer, 2008). Material culture could be an indicator of captives held at a site as well. Judith Mabicht-Mauche (2008) argues that the presence of local variations of Southwest pottery in protohistoric sites on the Southern Plains points to women from the Southwest living in these nomadic communities, possibly as captive wives. Burial contexts can also be a giveaway to a subordinate population at a site, such as careless burials and lack of grave goods (171).

The worse a captive or slave is treated, the more apparent they become in the archaeological record. This is because poor health, stress indicators, and infliction of violence show up in the bioarchaeological record. Pathologies, such as musculoskeletal markers and disease, especially those related to chronic undernutrition, can be used to identify a slave population. This pathology is based on the assumption that slaves are going to be treated worse than other people in the same population, have a poor diet, and be "worked to the bone" (Martin,

2010). One key indicator of nutritional stress shows up as porotic hyperostosis. Porotic hyperostosis is a lesion that shows up on the cranium or eye obits, as a result of anemia (Martin, 2001). Under the umbrella of musculoskeletal markers, degenerative joint diseases, such as arthritis or premature ossification, are due to the habitual wear and tear of joints. Enthesopathies, structural changes to the ligament and tendon attachments to the bone, can be indicative of hard wear and tear on a particular area (Villotte, 2010). Musculoskeletal markers tend to show up in the areas of the body that undergo the most stress, so women grinding corn would show a signature pattern of their skeletal remains (Martin, 2008). Lastly, evidence of violence, especially reoccurring violence, in a particular population is another indicator of the poor treatment of a subordinate group.

A group of women at the La Plata site in New Mexico contain all the bioarchaeologial markers mentioned above. This example has been used before in this paper, but an elaboration of the findings at La Plata is necessary. There is trauma found on all sexes and ages in the La Plata sample, but the trauma found particularly on women is startling. There are ten females with crania found at the site with an age range between 22 and 38. Of those ten females, 6 cases of healed head trauma were found (60%) (Martin, 2008; 167). Half of these women exhibited more than one case of healed head trauma, which points to multiple episodes of violence. Women with cranial trauma were found with more signs of anemia and chronic infection than the rest of the burial population (Martin, 2008; 170). They also showed ossification of their joints, musculoskeletal markers, and skeletal asymmetry, due to intense labor and habitual overuse of particular muscles (Martin, 2008; 170). This particular population was found without proper burial or grave goods as well. The woman at La Plata will be used as an example of what slaves look like in a burial population to compare with my findings. Holding

captives and taking part in the Slave trade was a reality at Pecos Pueblo during the historical period (Kessell, 1979). Having a case study to use as a comparison will act as a spring board from which to assess the burial population at Pecos Pueblo.

Methods

The data found in the *Pecos Pueblo Revisited* book is truly astounding. The book offers hundreds of pages of information on 1,127 the remains that were transported to the Peabody museum in the 1915 through 1929 field seasons. Every individual has a great deal of information that can be analyzed in a number of ways. My analysis of the data from *Pecos Pueblo Revisited*, is intended to create a narrative of the violence experienced by the ancient residents of Pecos Pueblo and Forked Lightning Ruin. The ultimate goal was to discover whether there was a pattern of the violence at these settlements during any of the time periods represented. By revealing systematic patterns of trauma, I hoped to be able to explore the nature of violence at Pecos Pueblo and Forked Lightning. In order to accomplish this goal, every bit of information that would pertain to individual trauma needed to be collected. It should be noted, that every for individual I recorded, I consistently use the ID number that corresponded with the ID number assigned by Morgan (2010) in their analysis.

Table 1

Ceramic stages from Morgan (2010)	Chronology
Black-on-White	AD 1175-1425
Glaze1	AD 1325-1425
Glaze 2	AD 1400-1450
Glaze 3	AD 1425-1490
Glaze 4	AD 1475-1515
Glaze 5	AD 1515-1700
Glaze 6	AD 1625-1700
Church*	AD 1706-?
Late/modern	AD 1700-1838

* notes my addition to Ceramic Stages (including date)

Table 1.5

Variable 1: Site	Variable 2:Ceramic stage	Variable 3: age	Variable 4: sex	Variable 5: sexsure
1= Pecos Pueblo	0=B on W	1= child (2-12yrsold)	1= male	1= positive
2= Forked Lightning	1= glaze 1	2=sub-adult (12-15 yrsold)	2= female	2=most likely
	2=glaze 2	3= adult	3= unknown	
	3= glaze 3	4= infant (0-2 yrsold)		
	4= glaze 4			
	5= glaze 5			
	6= glaze 6			
	7= church			
	8=late/modern			
	9= indeterminate			

I created a database using the information from *Pecos Pueblo Revisited: The Biological and Social Context,* by Morgan (2010). I recorded 13 variables taken from Morgan (2010). The list of the variables and their values are in this section, and in the appendix of this thesis. First, basic information was gathered for every individual: site, ceramic period, age, and sex. This information was copied onto a sheet of paper that could later be entered into an SPSS data file. For each variable, I created alphanumeric values. For example; for variable 1 (sex), male was recorded as "1",female as "2", and "0" as indeterminate sex (refer to table 1.5). Another variable, variable 5, indicated the reliability of the identification of sex; here a "1" meant that the sex identification was positive or mostly positive, and a "2" meant that the sex was probable. Age was recorded exactly as Morgan (2010) presented it, typically within an age range. For those that were just labeled as "adult", "child" or "infant", I used numbers that no human could ever obtain through age to signify each (400 for adult, 200 for baby, and so on). Then I gave numerical codes to the 7 ceramic stages (table 1.5). At times, I had to be subjective about which ceramic stage an individual belonged to. For instance, there were many individuals labeled "Probably GL. 1". For those cases, I ignored the "probably" and coded the time ceramic stage indicated. However, I attempted to average the individuals associated with multiple ceramic stages. If the person was probably from Glaze 1 or 2, they would be marked as "1.5". In some cases, an individual would "probably" belong to multiple ceramic stages. For example, the individual was marked as "probably GL. 1-3". If that was the case, glazeware 2 would be chosen as their period within the time period column. In other cases, the stretch of what they could belong to was so immense that I just marked them as indeterminate in the period column. One group of burials had no temporal design indicated by Morgan (2010). These individuals were buried in the "church nave" and were studied separately from the rest of the data. They were not

included with the church group in Morgan (2010), because the "church" group was its own excavated provenience. Because the "church" and "Church Nave" groupings had not been given any sort of temporal context, I created a category that would combine these two groups in the time period column, and used the number "7" as their signifier. All of these individuals were found in the 4th Mission Church at Pecos Pueblo. The church was built around AD 1706 (Morgan, 2010; 129), which is right after the ending of the glaze 6 ceramic period. This meant that there was a nice time continuum that was created by keeping the church burials separate (table 1). If need be, I could combine the church group into a Colonial era grouping on SPSS, as these burials undoubtedly belonged to individuals living in this late time period.

Table 2

Variable 6: Trauma1	Variable 7: trauma 2 (what kind)	Variable 8:Trauma 3 (Location)
0= no trauma	0= no trauma	0=no trauma
1= trauma present	1=indeterminate	1=head
	2=blow	2=forearm (radius/ulna)
	3= imbedded point	3=upper arm
	4= fracture	4=upper torso (lower ribs and above)
	5= cut	5=lower torso (below ribs)
	6=scalping	6= lower extremities
	7=dislocation	7=hands/fingers
	8=depression fracture	8=neck
	9=torn ligament/muscle	9=spine
	10=lesion	10=indeterminate
	11="massive" trauma	
	12=compression fracture	
	13=crack	
	14=greenstick fracture	
	15=indentation	

Table 2 cont.

Variable 9: Trauma 4(location on head)	Variable 10: Trauma 5 (Healing)
0= no trauma	0=no trauma
1=frontal lobe	1= indeterminate
2=L parietal	2=healed
3=R parietal	3=fatal/perimortem
4=L temporal	4=infected
5=R temporal	5=bony growth
6=L zygpmatic	
7=R zygomatic	
8=occipital	
9=nasal	
10=maxilla	
11=mandible	
12=indeterminate location	
13=R side of face	
14= L side of face	
15= back of skull	
16= top of skull	

Next, with the help of Douglas Bamforth and Catherine Cameron, I created 5 different categories for trauma. variable 6 was simple; mark "1" if an individual has trauma and mark "0" if they don't. For the next four variables for trauma (variables 7-10), I used my research thus far to create categories that would be meaningful and informative (refer to table 2). After reading numerous sources on violence found in archaeology, I noticed a pattern for attributing violence to bones. The first factor is what kind of trauma the bones show. To be more precise, what

marks show up of the bone. Is it marks on the scalp that could be attributed to scalping? Is it a greenstick fracture that probably occurred in a fall? I also wanted to concern myself with depression and compression fractures, as Debra Martin cited that same trauma as manifestations from a forceful whack with a blunt object (2008). Suffice to say, no stone was left unturned, as every type of trauma present on any individual was given a numeric variable (table 2). From remedial knowledge within this subject, one can already guess which types of traumas are more indicative of violence, and which are most likely caused by an accident. However, a problem I did find with the data in the book was the vagueness of the trauma recorded. I encountered many "trauma to the left femur" and had to make do.

Variable 8 would include the general locations of trauma (see table 2). The two categories I felt would provide the most information were the head and forearm. The head is the most common location for trauma in the case of assault (Shepard, 1990), and is the location most easy to attribute to violence. Separating forearm trauma from other trauma to the body was an objective of mine that would help my find potential "parry" fractures. Parry fractures are a type of forearm fracture that can occur as an arm is being used as a blocking arm (Smith, 1996). The problem with recording potential parry fractures in the case of this data set was the vagueness in which the fractures were recorded, as there can be several situations that end with a fractured forearm; breaking a fall or blocking a kick from a horse are a couple of the many possibilities (Judd, 2008). Still, patterns in fracturing of a forearm across sex, age, and time can have social implications. In retrospect, I regret not having separated the legs and feet into more categories, as trauma to those areas were quite frequent during the classic period of Pecos occupation and will be discussed further.

As trauma to the head is the most indicative of trauma of any location on the body, I created a trauma category (variable 8) attributed only to locations of trauma on the head (table 2). In his article "wife Beating, Boxing, and Broken Noses: Skeletal Evidence for the Cultural Patterning of Violence", the location of cranial trauma can illuminate social mechanisms and differences between sexes, which could also be correlated to combat violence or domestic violence (Walker, 1997). The numbers assigned to each part of the skull are shown on table 2. Once again, every head trauma fit into one of these categories. However, some head traumas that were recorded in the data from the reanalysis were vague, which means that "12" (indeterminate location) was used in 13 out of 78 cases of head trauma. For example, most scalping incidents were recorded as occurring on an indeterminate location on the head.

The fifth and final variable attributed to trauma (variable 10) was in relation to whether the trauma healed or not (table 2). If the description of the data from Morgan (2010) provided enough information, I hoped to learn in what way the recorded traumas healed. This category is invaluable in assessing trauma for a multitude of reasons. Perimortem trauma occurs at the time of death, and is usually the cause of death. On the other hand, healed trauma indicates a structural pattern of violence (Walker, 2001). Whether a trauma is healed or perimortem can directly relate to the type of instruments used to inflict the trauma as well. For instance, the use of a club has a greater chance of causing death than a bow and arrow (LeBlanc, 1999; 95) In turn, the frequency of perimortem vs. healed trauma speaks to the social context at a given place and time. As with all the other categories, sometimes the information was too vague, and the indeterminate marker was used often. For instance, there was no inference as to whether cases of scalping were fatal or healed in the data. It's implied that most scalping incidences happen shortly before or after death, but I wanted to stay as subjective as I could throughout this process.

Table 3

Variable 11: Pathology	Variable 12:Grave Goods	Variable 13: Cranial/Postcranial Remains
0=nothing	0=no grave goods	0=not present
1=arthritis	1= grave goods present	1= fragmentary
2=nutrition deficiencies		2=partial
3=infection		3= complete/nearly complete
4=tumor		
6=other		
7=spina bifida		

Other categories that I thought could enhance my understanding of trauma of an individual were also created (table 3). For instance, the women found at La Plata who could potentially be captives also showed signs of poor nutritional health and early onset of arthritis (Martin, 2008). Poor nutrition compared to other women at La Plata implied that this particular population's treatment was subpar. Arthritis within the particular population at the La Plata site was attributed to grueling hours of manual labor, particularly to grinding corn (Martin, 2008). As trauma could be a marker of captives at the site, this category was included to facilitate any more inquiry to a particular individual or population in regard to slavery. Poor health in an analysis of pathologies can also indicate conflict over access to resources. Under the scarce-resources-carrying-capacity model, the implication is that if resources are scarce, neighboring groups will fight each other for them (LeBlanc, 1999; 11). Poor pathologies for the entire group would be a signifier for this cause of violence. I was basic in my recording of the pathologies (refer to variable 11). Although analysis of individual pathology went more in depth in Morgan (2010), there was also a variable column presented in her data that had the same basic

recordings. In short, my recordings of pathology were copied out of this variable column in the data section in Morgan (2010). I started recording occurrences of spina bifida for my own side interests, as I noticed a relatively high percentage of the population had some form of it. I was curious as to what the occurrence of spina bifida at such high rates might imply. Was it a reoccurring trait because of genetic anomaly in the population, or might it have had something to do with diet and environmental factors? The presence of tumors was also something that recorded, but never used in my analysis.

The female La Plata burials analyzed by Martin (2008) exhibited a notable lack of grave goods compared to other individuals at the site. Martin suggested that this was an indication of poor treatment of that particular population (Martin, 2008). Her analysis was used as a platform to create a grave goods category for my analysis. If an individual had associated grave goods, a "1" was recorded. If there were no grave goods present, a "0" was recorded (Table 3). This category wound up not being used in my analysis, as I realized the presence of grave goods was not useful. Creating this category, however, allowed me to see how little of value it was.

I also recorded the number of cranial and post cranial elements present (table 3). This is important in assessing data, because an individual won't show a particular trauma if there is no correlating part.

After the data was transcribed onto paper, I then entered the data into an SPSS database. I expanded each category that pertained to pathology and trauma so everything that was recorded could then be analyzed individually. In short, everything that was assigned a number within a single trauma or pathology variable column became its own variable (refer to tables 2 and 3). For instance, arthritis was turned into its own column, infection became its own entity; instead of

being assigned a "1" or "3" as before (refer to variable 11 in table 3). In each new column, I would mark a "1" meaning present, or a "0" meaning not present. No column was left blank.

I created two SPSS data bases to help with the analysis of individuals that had more than one case of trauma. In the first database, I only used one line per individual. The second database contained one line for every individual, then another line for every subsequent trauma exhibited by that individual. To explain, if an individual had three different recorded traumas, the first data base would only contain one line for that individual. The second database would have three separate lines for the individual, each line correlating to a separate instance of trauma. For instance, one line would correspond with a "healed blow to the head", while another line for the same person would correspond with "healed fracture to the lower extremities". This way, I could use either data base for whatever analysis I wanted to do.

Table 4

Time Period	Glaze Ceramic Stage(s)
1=Coalition (AD 1175-1425) (AD 122-1325*) ->	Black-on-White
2=Classic (AD 1325-1515)(AD 1325-1600*) ->	Glaze 1- Glaze 4
3=transitional (AD 1515-1700)->	Glaze 5
4=Colonial (AD 1625-1838)(1620-1838*) ->	Glaze 6- Late/Modern & Church

* notes dates in Morgan (2010)

Originally, I transcribed the ceramic stage from Morgan (2010) onto paper. These categories were used in the SPSS database, however, broader categories were used to separate the burial population into four time periods: the Coalition, Classic, Transitional, and Colonial periods (table 4). In a single column, numbers were used to signify each period. All the individuals that were associated with the Black-on-White Ceramic Stages were recorded in the

Coalition Period; the period of initial migration and settlement into the Pecos River Valley and occupation of both Forked Lighting and Pecos Pueblo. Next, all individuals belonging to the Glaze 1 through the Glaze 4 stage were assigned a "2" to signify the Classic Period. My decision to separate Black-on-White and Glaze 1 into different time periods is worth mentioning, as both ceramic stages have 100 years of overlap (refer to table 1 and table 4). The first reason for separating the two is that the Black-on-White ceramic stage is the only ceramic stage present at both Pecos Pueblo and Forked Lighting. This would allow for a comprehensive comparison between the two sites. Using the starting date of Glaze 1 would also allow the Classic period to begin at the same time noted in Morgan (2010)(table 4). I also wanted to be as culturally accurate as I could be in this situation. In Morgan, this is mentioned about the Coalition period: "(Coalition ceramics) were characterized by white wares, black-on-white wares, and undecorated wares". Alternately, the Classic period was viewed as a time of "glaze decorated ceramics" (Morgan 2010, 14). In his research of Pecos Pueblo and Forked Lighting, Charles Mobley also states that black-on-white pottery was found in a strategically lower level than glazewares at Pecos Pueblo (1980;519). Next, Glaze 5 was given its own period, as this ceramic stage marks the time of transition between the Classic period and Colonial period (table 4). The Apache moved into the area just East of Pecos Pueblo at the beginning of the Transitional period, and the Spanish made their first visit to the pueblo 20 years after. I then created the Created the Colonial period for all burials from Glaze 6 onward. The Church burial sample is also included in this period. Both the Transitional and Colonial burials deviate from the chronology offered in Morgan (2010; 13). In Morgan (2010) the Classic period continues into the 1600's, however, my chronology marks the end of the Classic period 85 years earlier. The reason being, the Ceramic 5 ceramic stage is the perfect period to see the effects on the Pueblo during the beginning of

interactions with the Spanish and Apache. In Morgan (2010) the Mission period (AD 1620-1680) and the Post-Revolt, colonial (AD 1680-1838) are marked as two periods for Spanish occupation. I combined the two periods together into one for my analysis. I felt that combining the two would be beneficial for my analysis.

Table 5

Age (SPSS Version)
1= child (2-12 yrs old)
2= sub-adult (12-15 yrs old)
3= adult
4= infant (0-2 yrs old)
5= 16-19 yrs old
6= 20-24 yrs old
7= 25-29 yrs old
8= 30=39 yrs old
9= 40-49 yrs old
10= 50 + yrs old

Categories for age groups were created as exact ages and age ranges could not be entered into SPSS and observable connections be made. More age ranges were created for the younger age groups because if captive women were present in the burial record they would most likely be of childbearing age. Also, younger males are most likely to be warriors for the Pueblo. I found myself being subjective at times when assigning age groups to categories. Many times an individual would have an age range of 20 years. For this case, the individual would be placed in the median age group. For instance, an individual that had an age range of 20-35 in Morgan

(2010) would be marked in the 25-29 age group. If I felt uncomfortable placing an adult in an age group, the individual would receive a "3" for adult.

Data analysis

Sex count at Pecos Pueblo and Forked Lightning

Table 6

		certainty of sex		Total
		positive	probably	
	unknown	315	0	(28%)315
sex	male	341	35	(33%)375
	female	392	45	(39%)437
Total		1047	80	1127

This section will cover my analysis from my SPSS data research entered from Morgan (2010). The 600 year history at Pecos Pueblo and Forked Lightning offers a detailed glimpse into the patterning of trauma that suggests changes in the level of violence though time. The results of this study can be applied to the broad history of the American Southwest, and to the manifestations of relations with "the other". The variables considered here are sex and age in association with specific traumas. I will begin by describing the demographic patterns for the sites as a whole, then in four large period groupings. The population studied consists of 375 males (35 of which were identified as probably male), and 437 females (45 of which were identified as probably female), and 315 who's sex is indeterminate (table 6). Females are the largest group represented and make-up 39% of the population studied (table 6). Of the individuals of indeterminate sex, 145 individuals are under the age of 15, and 170 individuals are adults. The majority of the indeterminate adults within this sample have little to no cranial or postcranial remains to determine their sex. I will examine evidence of violence in each of these

periods as evident from trauma found on human remains in order to link patterns of violence with what is known archaeologically and historically about social interactions and aggression in the Pecos River Valley, and Pecos Pueblo and Forked Lightning specifically.

Percentages of age groups in the Population at Pecos Pueblo and Forked Lighting (adults that could not be placed in an age category are listed as "adult")

Table 7

			sex			Total
			unknown	male	female	
age of individual	child (2-12)	Count	85	0	5	90
		% within sex	27.1%	0.0%	1.1%	8.0%
	sub adult(12-15)	Count	16	6	9	31
		% within sex	5.1%	1.6%	2.1%	2.8%
	adult	Count	122	27	36	185
		% within sex	38.9%	7.2%	8.2%	16.4%
	Infant (0-2)	Count	43	0	0	43
		% within sex	13.7%	0.0%	0.0%	3.8%
	16-19	Count	14	20	34	68
		% within sex	4.5%	5.3%	7.8%	6.0%
	20-25	Count	7	19	49	75
		% within sex	2.2%	5.1%	11.2%	6.7%
	25-29	Count	3	43	57	103
		% within sex	1.0%	11.5%	13.0%	9.1%
	30-39	Count	9	113	100	222
		% within sex	2.9%	30.1%	22.9%	19.7%
	40-49	Count	8	88	76	172
		% within sex	2.5%	23.5%	17.4%	15.3%
	50+	Count	2	59	71	132
		% within sex	0.6%	15.7%	16.2%	11.7%
	fetus	Count	5	0	0	5
		% within sex	1.6%	0.0%	0.0%	0.4%
Total		Count	315	375	437	1127
		% within sex	100.0%	100.0%	100.0%	100.0%

Although trauma is evident on the Pecos remains, they seem to have been a fairly healthy population in comparison to other sites in the Southwest. Age structure can be used to suggest population health. One fourth of the burial population at Pecos Pueblo and Forked Lightning were under the age of 20 at the time of death, and over 3/4 were over the age of 20 (table 7). Individuals between the ages of 30 and 39 represent the largest age group within the burial sample, as they account for 20% of all the burials at both sites (table 7). There is a spike however, of individuals represented in in the age 12 and under age group (including infants), as 12% of the individuals are under the age of 12. This could relate to increased susceptibility to disease. However, the number of infants in the sample may be significantly under-represented because they were often ignored or overlooked during excavation (Morgan, 2010: 30). Overall, the life expectancy at Pecos is higher than other Native American communities (Larson,1987; 342).

There is a considerable difference in the age and sex ratios of the burials that is difficult to interpret. The majority of burials between 15 -29 years of age are females, whereas the majority of burials of individuals 30 to 49 years of age are male (table 8). For example, 2/3 of the burials for individuals between the ages of 20-25 are females. Females, however, represent the majority of individuals aged at 50 or older, at 54% (table 8). Morgan (2010) believed that these differences in sex representations for different age groups was a result of reproductive stress associated with females (death while giving birth), and differential burial treatment of males and/or higher mortality away from the pueblo due to warfare (Leblanc, 1999; 86; Morgan, 2010;31).

Percentages of sex belonging to each age category

Table 8

			sex			Total
			unknown	male	female	
age of individual	child (2-12)	Count	85	0	5	90
		% within age of individual	94.4%	0.0%	5.6%	100.0%
	sub adult(12-15)	Count	16	6	9	31
		% within age of individual	51.6%	19.4%	29.0%	100.0%
	Adult	Count	122	27	36	185
		% within age of individual	65.9%	14.6%	19.5%	100.0%
	Infant (0-2)	Count	43	0	0	43
		% within age of individual	100.0%	0.0%	0.0%	100.0%
	16-19	Count	14	20	34	68
		% within age of individual	20.6%	29.4%	50.0%	100.0%
	20-25	Count	7	19	49	75
		% within age of individual	9.3%	25.3%	65.3%	100.0%
	25-29	Count	3	43	57	103
		% within age of individual	2.9%	41.7%	55.3%	100.0%
	30-39	Count	9	113	100	222
		% within age of individual	4.1%	50.9%	45.0%	100.0%
	40-49	Count	8	88	76	172
		% within age of individual	4.7%	51.2%	44.2%	100.0%
	50+	Count	2	59	71	132
		% within age of individual	1.5%	44.7%	53.8%	100.0%
	fetus	Count	5	0	0	5
		% within age of individual	100.0%	0.0%	0.0%	100.0%
Total		Count	315	375	437	1127
		% within age of individual	27.9%	33.3%	38.8%	100.0%

The pathologies recorded for the data set directly from Morgan, 2010 can be found in direct correlation with population trends. For example, a growing population with a limited number of resources will show malnourishment on the human remains. On the whole, Pecos Pueblo and Forked Lighting Ruin were relatively healthy compared to other burial samples, such as Black Mesa and Arroyo Hondo found in Nelson, Martin, Swedlund, Fish, and Armegalos (1991). In the Pecos Pueblo and Forked Lighting sample, 40% of the population had nutritional deficiencies (table 9), 38% with arthritis (table 10), and 31% with some form of infection (Table 11).

Nutrition frequencies for entire sample

Table 9

		sex			Total
		unknown	male	female	
	adequate nutrition	248	205	228	(60%)681
	poor nutrition	67	170	209	(40%)446
Total		315	375	437	1127

arthritis Frequencies for entire sample

Table 10

		sex			Total
		unknown	male	female	
	no arthritis	289	177	228	(62%)694
	arthritis	26	198	209	(38%)433
Total		315	375	437	1127

infection frequencies for entire sample

Table 11

		sex			Total
		unknown	male	female	
infection	no infection	292	224	257	(69%)773
	infection	23	151	180	(31%)354
Total		315	375	437	1127

Number of burials represented by period

Table 12

		period					Total
		coalition	classic	transitional	colonial	indeterminate	
site	Pecos Pueblo	38	419	63	218	282	(91%) 1020
	Forked Lightning	107	0	0	0	0	(9%) 107
Total		(13%) 145	(37%) 419	(6%)63	(19.3%) 218	(25%) 282	(100%) 1127

The Coalition Period

The Coalition period (1175-1425 A.D.) is marked by migrations from the Mesa Verde region into the Pecos River Valley, and the surrounding areas. The majority of the remains from this period are from Forked Lightning, a small pueblo community just ½ a mile southwest of Pecos Pueblo. Because all the burials from Forked Lightning are from this period, the two sites will be considered separately. Pecos will be heavily emphasized, as it contains a longer sequence of occupation and contains 91% of the individuals in this study (table 12).

There are 145 burials from this period; 13% of the entire population studied (table 12). Forked Lightning makes up close to ¾ of the Coalition burials, as 107 individuals were recovered from this site. Only 38 of the burials belong to Pecos Pueblo, because it contained a smaller population during this time period (Morgan, 2010; 13). Since the Coalition Period is the only one that lends itself to analysis of two pueblo sites at one time, taking a closer look at the pathology of the human remains will illuminate any disparities between sites in the Pecos River Valley. Of all the individuals from this period, only 35% show symptoms of inadequate

nutrition. Half of the burial sample at Pecos had inadequate nutrition as opposed to 29% at Forked Lightning (table13). Symptoms of arthritis become evident on individuals in their 30's. Almost 40% Pecos individuals had arthritis, while only 12% of Forked Lightning individuals had arthritis, which also indicates a lower quality of health for inhabitants at Pecos Pueblo (table 14). When looking at the number of individuals that have infections, the Pecos Pueblo burials have a higher percentage (37%) of individuals with an infection than those at Forked Lighting (11%; table 15). Taking the numbers into consideration, disparities in health exist between the residents at Pecos Pueblo and Forked Lightning: the residents at Forked Lighting were healthier.

Nutrition frequencies for the Coalition period by site

Table 13

			nutrition		Total
			adequate nutrition	poor nutrition	
site	Pecos Pueblo	Count	19	19	38
		% within site	50.0%	50.0%	100.0%
	Forked Lightning	Count	76	31	107
		% within site	70.8%	29.2%	100.0%
Total		Count	94	50	145
		% within site	65.3%	34.7%	100.0%

Arthritis frequencies for the Coalition period by site

Table 14

			arthritis		Total
			no arthritis	arthritis	
site	Pecos Pueblo	Count	23	15	38
		% within site	60.5%	39.5%	100.0%
	Forked Lightning	Count	94	13	107
		% within site	87.7%	12.3%	100.0%
Total		Count	116	28	145
		% within site	80.6%	19.4%	100.0%

Infection frequencies for the Coalition period by site

Table 15

			infection		Total
			no infection	infection	
site	Pecos Pueblo	Count	24	14	38
		% within site	63.2%	36.8%	100.0%
	Forked Lightning	Count	95	12	107
		% within site	88.7%	11.3%	100.0%
Total		Count	118	26	145
		% within site	81.9%	18.1%	100.0%

There are only 8 incidents of trauma seen on 6 Coalition Period individuals; three from Pecos Pueblo and three from Forked Lightning (table 16). Of the 6 individuals with trauma, 4 could possibly be related to violence. Two of these individuals are males in their 40's, one woman in her mid-20's, and an adult whose sex is unknown. The two individuals identified as males both have healed head trauma. One is from the Pecos burial group (who also has a fractured left fibula), the other from Forked Lighting. The individual of an unknown sex (from the Forked Lightning group) has a fractured tibia and a spear point found in association with the ribs. Because of the presence of the point, this is the only individual of the Coalition group that is undoubtedly is the victim of a violent act. The female with signs of trauma is aged in her mid-twenties and has a healed sternum fracture. Because a sternum fracture can only be the outcome of heavy force impact (Jenkins, 2005; 74), this could be related to a violent act. The other two traumas from this period are possibly from occupational or everyday hazards, as they are broken fingers and toes. It is important to note, that aside from the unsexed individual, every trauma was healed. Four percent of the Coalition Period burial group shows evidence of trauma

opposed to 14% of the overall population. In comparison with the other periods, the Coalition Period seems to be a relatively healthy and non-violent time.

Trauma incidents by body location and site

Table 16

		Body location				Total
		head	upper torso	lower extremities	hands	
site	Pecos Pueblo	1	1	2	0	4
	Forked Lightning	1	1	1	1	4
Total		2	2	3	1	8

The Classic Period

During the Classic period (1325-1600 A.D.), the inhabitants from the surrounding pueblos congregated at Pecos Pueblo, as the population drastically increased and the pueblo grew in size. Forked Lightning Ruin was abandoned and residents moved to Pecos Pueblo. The Glaze 3 ceramic Stage (1425-1490 A.D.) will be analyzed in depth in this section, as substantial change took place at Pecos Pueblo during this time. Also, Glaze 3 contains the largest number of human remains of any ceramic stage, as 1/3 of the burials in the Classic period are associated with this ceramic stage. Altogether, there are 419 burials from the Classic period (table 17).

Classic period burial population by sex

Table 17

		period	Total
		classic	
sex	unknown	(20.2%) 85	85
	male	(35.7%) 150	150
	female	(43.9%) 184	184
Total		419	419

Half of the Classic period burial group (51%) show some form of malnourishment. This might be due in part to the aggregation that occurs during this time, which put a strain on the already short growing season in the Pecos River Valley. There are no disparities in malnourishment among men and women (table 18). Signs of arthritis primarily show up for members of the population between the ages of 30 and 35. However, females make up the overwhelming majority the youngest group that displays arthritis; the 25-39 age group (table 19). This age group of females shows other signs of poor health. For example, the majority of the females have pathologies related to infection and poor nutrition. However, none of these females show any signs of trauma. Thirty eight percent population within this period exhibit some form of infection (table 20). With all pathologies considered, The Classic Period had a higher percentage of pathologies that indicate poor health than any other period.

Classic period Nutritional Frequencies

Table 18

			nutrition		Total
			adequate nutrition	poor nutrition	
sex	unknown	Count	65	20	85
		% within sex	76.5%	23.5%	100.0%
	male	Count	65	85	150
		% within sex	43.3%	56.7%	100.0%
	female	Count	76	108	184
		% within sex	41.3%	58.7%	100.0%
Total		Count	206	213	419
		% within sex	49.2%	50.8%	100.0%

Classic Period Arthritis Frequencies in 25-29 age group and total population

Table 19

age of individual				arthritis		Total
				no arthritis	arthritis	
25-29	sex	unknown	Count	1	0	1
			% within arthritis	3.7%	0.0%	2.5%
		male	Count	10	2	12
			% within arthritis	37.0%	15.4%	30.0%
		female	Count	16	11	27
			% within arthritis	59.3%	84.6%	67.5%
	Total		Count	27	13	40
			% within arthritis	100.0%	100.0%	100.0%
Total	sex	unknown	Count	73	12	85
			% within arthritis	32.6%	6.2%	20.3%
		male	Count	58	92	150
			% within arthritis	25.9%	47.2%	35.8%
		female	Count	93	91	184
			% within arthritis	41.5%	46.7%	43.9%
	Total		Count	224	195	419
			% within arthritis	100.0%	100.0%	100.0%

Classic period infection frequencies

Table 20

			infection		Total
			no infection	infection	
sex	unknown	Count	75	10	85
		% within sex	88.2%	11.8%	100.0%
	male	Count	83	67	150
		% within sex	55.3%	44.7%	100.0%
	female	Count	99	85	184
		% within sex	53.8%	46.2%	100.0%
Total		Count	257	162	419
		% within sex	61.3%	38.7%	100.0%

Classic period trauma frequencies (by individual)

Table 21

			trauma		Total
			no trauma	trauma present	
sex	unknown	Count	79	6	85
		% within sex	92.9%	7.1%	100.0%
	male	Count	115	35	150
		% within sex	76.7%	23.3%	100.0%
	female	Count	159	25	184
		% within sex	86.4%	13.6%	100.0%
Total		Count	353	66	419
		% within sex	84.2%	15.8%	100.0%

There are 66 individuals that show trauma from the Classic period burial sample, 16% of the population at this time (table 21). Of the individuals that show signs of trauma, there are 35 males, 25 females, and 6 individuals of an unknown sex. Considering that males make up a slightly lower portion of the population, 23% of all the males show some sort of trauma (table 21). Males are also most likely to have multiple incidences of trauma per individual, as 35 males with trauma account for 45 cases of trauma (table 22). The most common locations of trauma for the male population are, in order: to the lower extremities (13), forearm (10), and the head (7). Taking a close look at men's trauma to the head, the majority of the trauma is to the left parietal lobe (4 cases), and 2 to the right parietal lobe (table 23). Trauma on males lower extremities have no patterning, as there is almost an equal number of fractured femurs, tibias, fibulas, and toes.

Classic period trauma locations (by incident, not individual)

Table 22

		Trauma location									Total
		head	forearm	upper arm	upper torso	lower torso	Lower extremities	hands	spine	10.00	
sex	unknown	1	1	1	0	1	2	0	0	0	6
	male	7	10	4	3	3	13	2	3	0	45
	female	7	7	3	2	0	7	0	0	1	27
Total		15	18	8	5	4	22	2	3	1	78

Classic Period head trauma locations (By incident)

Table 23

		Head locations								Total
		frontal lobe	Lparietal	Rparietal	Rzygomatic	occipital	nasal	Ind.	R side of face	
sex	unknown	0	0	1	0	0	0	0	0	1
	male	1	4	2	0	0	0	0	0	7
	female	0	1	1	1	1	1	1	1	7
Total		1	5	4	1	1	1	1	1	15

Women in the Classic period show the same patterning of trauma as the men. The three most common trauma locations are the lower extremities (7), forearm (7), and head (7) (table 22). The only patterning of trauma to the lower extremities for the female burial group is three instances of broken toes. These incidents of trauma are most likely related to everyday hazards. It should be noted, that the women in the classic period burial sample have the same number of head trauma incidences as the men, however there is no patterning of women's head trauma (table 23). There are two cases of scalping in the Classic burial sample affecting one female

and one male, both marked as "probably" belonging to the Glaze 1 or 2 Ceramic Stages. Because they were entered into separate proveniences and could be from one of two Ceramic Stages, it's possible they were the victims of a single episode of violence, although it's unlikely.

There are 6 individuals of indeterminate sex that show trauma in the Classic period (table 22). There are two traumas that have no record as to whether they healed, or not. The first is child from the Glaze 2 Ceramic Stage that shows scalping marks on the cranium. Considering the type of trauma, this incident is most likely perimortem and related to warfare or external conflict. The second is an adult with a lower vertebral compression fracture. Of the incidents of trauma found on adult individuals of an unknown sex that show signs of healing, there are two lower extremity traumas, one upper arm trauma, and one forearm trauma.

Glaze 3 sex and age representations

Table 24

		sex			Total
		unknown	male	female	
16-19	Count	2	3	5	10
	% within age of individual	20.0%	30.0%	50.0%	100.0%
20-25	Count	2	0	8	10
	% within age of individual	20.0%	0.0%	80.0%	100.0%
25-29	Count	1	6	11	18
	% within age of individual	5.6%	33.3%	61.1%	100.0%
30-39	Count	3	21	12	36
	% within age of individual	8.3%	58.3%	33.3%	100.0%
40-49	Count	0	9	7	16
	% within age of individual	0.0%	56.2%	43.8%	100.0%
Total	Count	27	47	54	128
	% within age of individual	21.1%	36.7%	42.2%	100.0%

The Glaze 3 Ceramic Stage marks the transition of Pecos Pueblo into the large aggregated community as it was known. Most likely due to aggregation, there are more individuals (128) in the Glaze 3 burial sample than any other ceramic stage. Again, the female population represents the majority of burials from the 16-29 age group, and males represent the majority of the burial sample between the ages of 30 and 40 (table 24). The pathology from this ceramic stage is disquieting. 66% of the male population and 57% of the female population show signs of malnourishment (table 25), more than half of male and female populations have arthritis (table 26), and 35% of the entire population show skeletal markers for infection (table 27). The Glaze 3 burial sample shows more signs of malnourishment than any ceramic stage in the collection.

Glaze 3 nutrition frequencies

Table 25

			nutrition		Total
			adequate nutrition	poor nutrition	
sex	unknown	Count	22	5	27
		% within sex	81.5%	18.5%	100.0%
	male	Count	16	31	47
		% within sex	34.0%	66.0%	100.0%
	female	Count	23	31	54
		% within sex	42.6%	57.4%	100.0%
Total		Count	61	67	128
		% within sex	47.7%	52.3%	100.0%

Glaze 3 arthritis frequencies

Table 26

			arthritis		Total
			no arthritis	arthritis	
sex	unknown	Count	25	2	27
		% within sex	92.6%	7.4%	100.0%
	male	Count	20	27	47
		% within sex	42.6%	57.4%	100.0%
	female	Count	31	23	54
		% within sex	57.4%	42.6%	100.0%
Total		Count	76	52	128
		% within sex	59.4%	40.6%	100.0%

Glaze 3 infection frequencies

Table 27

			infection		Total
			no infection	infection	
sex	unknown	Count	25	2	27
		% within sex	92.6%	7.4%	100.0%
	male	Count	29	18	47
		% within sex	61.7%	38.3%	100.0%
	female	Count	25	29	54
		% within sex	46.3%	53.7%	100.0%
Total		Count	79	49	128
		% within sex	61.7%	38.3%	100.0%

Because of the large burial sample of individuals belonging to the Glaze 3 ceramic stage, 1/3 of the individuals that show signs of trauma in the Classic period are from this stage. Almost 1/4 of the male population in the Glaze 3 sample shows signs of trauma and almost 20% of the female population (table 28). Out of 25 individuals with trauma, 16 have healed trauma. Again, there is a strong patterning of trauma to the lower extremities at this period, as 2/3 of all the incidences of male trauma, and 1/3 of female trauma is related to this location (table 30). There are four individuals in the burial group that have head trauma, two males and two females (table 30). One female has head trauma that can be directly related to violence, as the trauma is recorded as "4 perimortem blows to the left parietal", and is the only individual marked with perimortem trauma in the Classic period (Morgan, 2010; 228-229). This individual (60311), aged between 25 and 34 years of age also has a healed left elbow fracture, which might be indicative of a victim of repeated violence. Although this individual shows signs of infection, she has no other pathologies that might infer her status as a captive. The other female, aged between 18-22, has healed occipital trauma. This female shows signs of malnourishment. The head trauma the two males have suffered can both be related to violence. The first individual, aged between 30 and 34, displays a blow to the parietal that extends over to the left side of his head. The other male, between 35 and 44 years of age, has depression fractures on both the left and right parietals.

Table 28 **Glaze 3 trauma frequencies by individual**

			Trauma		Total
			no trauma present	trauma present	
sex	unknown	Count	26	1	27
		% within sex	96.3%	3.7%	100.0%
	male	Count	33	14	47
		% within sex	70.2%	29.8%	100.0%
	female	Count	44	10	54
		% within sex	81.5%	18.5%	100.0%
Total		Count	103	25	128
		% within sex	80.5%	19.5%	100.0%

Glaze 3 Location of trauma and frequencies (by incident)

Table 30

			traumalocation						Total
			head	forearm	upper arm	upper torso	Lower extremities	hands	
sex	unknown	Count	0	0	0	0	1	0	1
		%	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%	3.6%
	male	Count	3	2	1	0	9	1	16
		%	60.0%	33.3%	50.0%	0.0%	69.2%	100.0%	57.1%
	female	Count	2	4	1	1	3	0	11
		%	40.0%	66.7%	50.0%	100.0%	23.1%	0.0%	39.3%
Total		Count	5	6	2	1	13	1	28
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The Transitional Period

The Transitional Period is a collection of only Glaze 5 burials (AD 1515-1700). The two hundred years this period encompassed is one of immense change. The Apache moved onto the Western Great Plains, just East of Pecos Pueblo, at the beginning of this Period. The Spanish came into first contact with Pecos shortly after, and settled the area by the end of this period. There is a 75 year overlap with the ending of this period and the beginning of the Colonial Period. Because I was working with ceramic dates from Morgan (2010) in my analysis, and not period dates, making a clear cut between the two periods is impossible. Having a bit of an overlap with the Glaze 6 ceramic stage, however, will illuminate trends between the two periods. There are 63 burials in this sample, 25 males, 28 females, and 10 individuals of an unknown sex. Seven out of ten individuals of an unknown sex are children. There are more females from the Transitional Period represented between the ages 16-25 than males, fitting the general trend for the entire population. There are mixed pathologies from this period. Fifty seven percent of all females and 64% of all males show arthritis (table 31), and 3/5 of males and almost half the female population have infections (table 32); which is considerably high. However, close to 40% of the entire population has some nutritional deficiency, which is about average (table 33).

Transitional period arthritis frequencies

Table 31

			arthritis		Total
			no arthritis	arthritis	
sex	unknown	Count	10	0	10
		% within sex	100.0%	0.0%	100.0%
	male	Count	9	16	25
		% within sex	36.0%	64.0%	100.0%
	female	Count	12	16	28
		% within sex	42.9%	57.1%	100.0%
Total		Count	31	32	63
		% within sex	49.2%	50.8%	100.0%

Transitional period infection frequencies

table 32

			infection		Total
			no infection	infection	
sex	unknown	Count	10	0	10
		% within sex	100.0%	0.0%	100.0%
	male	Count	10	15	25
		% within sex	40.0%	60.0%	100.0%
	female	Count	15	13	28
		% within sex	53.6%	46.4%	100.0%
Total		Count	35	28	63
		% within sex	55.6%	44.4%	100.0%

Table 33 **Transitional period nutrition frequencies**

			nutrition		Total
			adequate nutrition	poor nutrition	
	unknown	count	(60%) 6	(40%) 4	10
Sex		Male count	(60%) 15	(40%) 10	25
		Female count	(60.7%) 17	(39.3%) 11	28
		Total count	(60.3%) 38	(39.7%) 25	63

There are 9 individuals from the Transitional Period that show trauma. Three of these individuals are male (12% of the male burial sample) and 6 are female (table 34). This is interesting, because it is the only period that contains more females with trauma than males. There are two males that contain head trauma in the male burial group; one male with 5 healed lesions on the left parietal and another with a healed compression fracture on the frontal lobe. The male with the healed compression fracture is between 25 and 30 years old. Considering his age and the type of trauma, his trauma was most likely caused by a violent act. The third male trauma is a healed fractured foot. Twenty one percent of the female burial group is associated with trauma (table 34), however, there is little patterning to the trauma (refer to table 35). Interestingly, all of the trauma in the Transitional Period is healed, except for one cranial trauma on a female. This particular trauma has been vaguely reported in Morgan (2010; 197), however. One female shows two separate instances of trauma; one healed fracture to the upper arm and another to the left fibula. Although this is peculiar, the trauma cannot be directly related to violence.

Transitional frequencies of trauma by individual

Table 34

			trauma		Total
			no trauma present	trauma present	
sex	unknown	Count	10	0	10
		% within sex	100.0%	0.0%	100.0%
	male	Count	22	3	25
		% within sex	88.0%	12.0%	100.0%
	female	Count	22	6	28
		% within sex	78.6%	21.4%	100.0%
Total		Count	54	9	63
		% within sex	85.7%	14.3%	100.0%

Transitional period trauma locations (by incidence)

Table 35

		traumalocation					Total
		head	forearm	upper arm	upper torso	Lower extremity	
sex	male	2	0	0	0	1	3
	female	1	1	2	2	1	7
Total		3	1	2	2	2	10

The Colonial Period

The Colonial Period (AD 1625-1838), marks a time of tumultuous Pecos relationships with the Apache, Spanish, and Comanche. Most of the burials from this period are from my conglomerate "church" category, from Morgan's church and church nave proveniences (2010). Because of the large size of the church group and the horrific brutality displayed, this burial group will be looked at in depth, then compared to the other ceramic stages (Glaze 6-mordern/late) within the Colonial period. But first, an analysis will be made on the period as a whole. There are 217 individuals in the Colonial period population; 66 females, 85 males, and 66 individuals of an unknown sex. Taking pathologies into consideration, the Colonial period is considerably healthy. There are no disparities in health between men and women. Less than 1/4 of all men and women show signs of poor nutrition (table 36), 30% of both men and women have arthritis (table 37), and 31% of males and 36% of females have infections (table 38). Those of an unknown sex have a low percentage of pathologies related to poor health

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Colonial period nutrition frequencies

Table 36

					Total
			adequate nutrition	poor nutrition	
sex	unknown	Count	58	8	66
		% within sex	87.9%	12.1%	100.0%
	male	Count	67	18	85
		% within sex	78.8%	21.2%	100.0%
	female	Count	50	16	66
		% within sex	75.8%	24.2%	100.0%
Total		Count	175	42	217
		% within sex	80.6%	19.4%	100.0%

Colonial period arthritis frequencies

Table 37

			arthritis		Total
			no arthritis	arthritis	
sex	unknown	Count	63	3	66
		% within sex	95.5%	4.5%	100.0%
	male	Count	59	26	85
		% within sex	69.4%	30.6%	100.0%
	female	Count	46	20	66
		% within sex	69.7%	30.3%	100.0%
Total		Count	168	49	217
		% within sex	77.4%	22.6%	100.0%

Colonial period infection frequencies

Table 38

			infection		Total
			no infection	infection	
sex	unknown	Count	63	3	66
		% within sex	95.5%	4.5%	100.0%
	male	Count	58	27	85
		% within sex	68.2%	31.8%	100.0%
	female	Count	42	24	66
		% within sex	63.6%	36.4%	100.0%
Total		Count	163	54	217
		% within sex	75.1%	24.9%	100.0%

Colonial period trauma frequencies (By incidence)

Table 39

		Trauma location								Total
		head	forearm	upper arm	upper torso	Lower extremity	hands	spine	Ind.	
sex	unknown	4	0	0	1	1	0	0	0	6
	male	22	2	1	2	2	0	2	1	32
	female	11	1	0	1	0	1	0	1	15
Total		37	3	1	4	3	1	2	2	53

The population from this period shows the most extreme amount of brutality in the entire data set. There are 37 individuals in this period that show skeletal evidence of trauma. seven individuals show more than one incidence of trauma; 5 of them are male. One male accounts for 4 incidents of trauma, and another for 3. There are 29 individuals with head trauma in the Colonial burial representation; just less than half the all the recorded head traumas for the entire data set. Trauma to other parts of the body only amount to 1/3 of trauma from the Colonial Period (refer to table 39). Eight of the eleven cases of scalping from the entire data set come

from this period, seven from the church group alone. The Colonial period also contains more than half of all the traumas associated with children and sub-adults (5 out of 8 cases in the entire data set), all of which are head traumas (see head trauma for unknown sex in table 39). In fact, head trauma affected every single age group within the burial population in this period (table 40). Also, all but one perimortem trauma recorded in Morgan (2010) is from this period (table 40.1). All of these factors speak to the intensity of the violence seen in the Colonial Period.

Table 40 **Colonial head trauma frequencies per age group (by incident)**

		Total
		trauma on head
age of individual	child (2-12)	5
	sub adult(12-15)	1
	adult	1
	16-19	6
	20-25	4
	25-29	8
	30-39	5
	40-49	4
	50+	3
Total		37

Perimortem trauma counts for entire sample

Table 40.1

								Total
	coalition	classic	glaze 3	glaze 5	colonial	church	indeterminate	
trauma was fatal or perimortem			1			13	1	15

There are 42 individuals in the burial sample associated with Colonial Ceramic Stages, the majority (34 individuals) are from the Glaze 6 ceramic stage time period (AD1625-1700). The pathologies from these stages point towards bad health as 50% of the population has an infection, 41% show signs of poor nutrition, and 62% show signs of arthritis (tables 41-43). There are only 4 individuals that show evidence of trauma from the Colonial Ceramic Stages, 3 females and 1 male (10% of the burial group). The one male shows trauma to the nasal bone and healed trauma to the upper torso. Of the females that have trauma, one has a broken finger, another has a fractured forearm, and another with scalping marks on the left and right parietals. Clearly, the last mentioned trauma is indicative of violence. However, the burials from this sample have poor health but show little evidence of trauma and violence.

Nutrition frequencies for Colonial ceramic & church groups

Table 41

			Colonial ceramic	church
nutrition	adequate nutrition	Count	25	150
		%	59.5%	85.2%
	poor nutrition	Count	17	26
		%	40.5%	14.8%
Total		Count	42	176
		%	100.0%	100.0%

Arthritis frequencies for Colonial c. and church

table 42

			Colonial ceramic	church
arthritis	no arthritis	Count	16	153
		%	38.1%	86.9%
	arthritis	Count	26	23
		%	61.9%	13.1%
Total		Count	42	176
		%	100.0%	100.0%

Table 43 **Infection frequencies for Colonial ceramic and church groups**

			colonial	church
infection	no infection	Count	21	142
		%	50.0%	80.7%
	infection	Count	21	34
		%	50.0%	19.3%
Total		Count	42	176
		%	100.0%	100.0%

The church population is made up of 176 individuals (50 females, 66 males, and 60 individuals of an unknown sex), which is over one hundred more individuals than Morgan's church grouping of 68 individuals (2010). However, grouping the entire population found in association with the church creates a complete picture of that population, while Morgan's analysis is supplementary (2010). The pathology within the church sample marks the lowest rates of pathologies associated with poor health out of any period. Only 13% of the church sample show signs of arthritis (table 42), less than $1/6^{th}$ have symptoms associated with malnourishment (table 41), and 19% of the church group have infections (table 43). The overall good health is interesting to note in the context of the violence seen in this burial group vs. the low amount of trauma seen in the Colonal ceramic periods with poor health pathologies.

It is extremely important to note that there are 16 individuals of Caucasian (10) or mixed descent (6) in this sample. Looking at the pathologies of these individuals, there's only one case of each trauma, infection, arthritis, and two cases of nutrition deficiencies for those of European descent. Individuals of mixed decent certainly have worse pathologies, as 4 out of 6 had

infections apparent on the bones. Also, 4 of six 6 mixed individuals were victims of horrific violence (two males and two females).

Church burial group trauma frequencies

Table 44

			trauma		Total
			no trauma present	trauma present	
sex	unknown	Count	57	3	60
		% within sex	95.0%	5.0%	100.0%
	male	Count	47	19	66
		% within sex	71.2%	28.8%	100.0%
	female	Count	39	11	50
		% within sex	78.0%	22.0%	100.0%
Total		Count	143	33	176
		% within sex	81.2%	18.8%	100.0%

Church burial group trauma location count (by incident)

Table 45

		traumalocation								Total
		head	forearm	upper arm	upper torso	Lower extremity	hands	spine	Ind.	
sex	unknown	3	0	0	0	1	0	0	0	4
	male	22	2	1	2	3	0	2	0	32
	Female	10	0	0	2	0	0	0	0	12
Total		35	2	1	3	4	1	2	0	48

Church burial head trauma location count (by incident)

Table 46

		traumahead											Total
		frontal lobe	Lparietal	Rparietal	Ltemporal	Rtemporal	occipital	nasal	Ind	L side of face	back of skull	top of skull	
sex	unknown	0	0	0	0	0	1	0	2	0	0	0	3
	male	4	2	1	3	1	0	3	5	2	1	1	23
	female	4	2	1	0	0	0	1	2	0	0	0	10
Total		8	4	2	3	1	1	4	9	2	1	1	36

Church burial age and sex of individuals that show trauma

Table 47

		age of individual									Total
		child (2- 12)	sub adult(12-15)	adult	16-19	20-25	25-29	30-39	40-49	50+	
sex	unknown	2	0	1	0	0	0	0	0	0	3
	male	0	0	1	3	1	4	4	3	3	19
	female	2	1	1	0	2	2	2	0	1	11
Total		4	1	3	3	3	6	6	3	4	33

Because of the larger number of the church group, 19% of individuals within this group have reported trauma, as opposed to the 40% in Morgan's analysis (2010). There are 19 males that show trauma, close to 1/3 of all the males in the church population (table 44). This is the

highest percentage of male trauma out of any ceramic stage or time period. For the male population, there are 32 cases of recorded trauma, 2/3 of which are head traumas (table 45). Of all male head traumas, there are only 5 that are recorded as having healed. There are 5 scalping incidents within this grouping, which is the strongest patterning of head trauma for the male church group (marked as trauma to an indeterminate location on table 46). Using Morgan's analysis to elaborate on the indeterminate head traumas recorded for males, there are two incidents of chopping to the skull, three incidents of bladed trauma, and one case of antemortem frontal fractures (these traumas were marked as being indeterminate in the type of trauma category, but correlate to a specific location on the head) (2010;133-135). This is a patterning of trauma seen nowhere else within the entire burial sample. Not only is this trauma horrifically violent, forceful trauma caused by weapons with sharp edges is not seen in prior periods. There are males with trauma represented in every age group from 16 +. However, the most affected male group is the 16-19 age group, as half of the males within this population (3/6) have associated traumas, two of which are head traumas caused by violence. For a more complete look at the ages of individuals that show trauma, please refer to table 47.

Eleven females, about ¼ of the female population in the church group show 12 incidents of trauma (table 44). All age groups, from childhood to old age are represented in this sample, except for the 16-19 age group (table 47). This is an interesting pattern, considering half of the male population for the same age group showed signs of trauma. All the females in this representation have head trauma, excluding a female aged 50+ with healed shoulder trauma and other 20-25 year old with a healed fractured clavicle (that also has had trauma) (table 45). The male population showed a stronger patterning of trauma implemented by bladed weaponry, as only two females show trauma related to chops and bladed trauma (Morgan, 2010; 133-135).

However, almost half of the recorded head traumas for females in the church burial group were to the frontal lobe (table 46). Going against the male patterning, again, there is only one female in the population that shows scalping marks. In both the male and female burial populations with trauma, trauma associated with other areas of the body are much more likely to have been healed (all females and 2/3 of males), opposed to the low rates of healed cranial trauma (less than 10% for males and ¼ for females).

There are 58 individuals of an unknown sex in the church sample, 40 are adults. There is only one instance of trauma in this adult population; a healed fractured fibula. The population of children shows a much higher frequency of trauma, however. There are only 11 individuals of an unknown sex aged 15 and under; two with severe perimortem head trauma (one of which could possibly be sexed as female). There are also three females that have trauma and are aged 15 and under. Because these three females fit in this particular age group, they will be considered for this discussion. Taking the individual that could possibly be female into consideration, every child that can be gendered in this group is female; an interesting pattern. Altogether, there are 5 children that show signs of trauma in the church group, all of which are head traumas. As there are only 8 incidents of trauma in the entire burial population for individuals under the age of 15, the 5 individuals found in the church group is a staggering number. One girl aged 12.5-13.5 years old has a healed nasal fracture, and is the only individual out of this group that did not suffer from perimortem head trauma. This individual also contains a pathology consistent with malnourishment. One child, 2 years old, has a "healed occipital fracture and perimortem bladed fracture to the Left Parietal" (Morgan, 2010; 133). This child is the youngest of the entire sample and also shows malnourishment. An individual that could possibly be female is 5-6 years old and shows signs of perimortem cranial chops. Another girl of

mixed decent aged around 11-12 also shows signs of perimortem chops. Lastly, a girl, 10-11 years old, shows signs of perimortem fractures and scalping marks on her cranium. Obviously, these children were victims of horrific violence.

Overall remarks on trauma

With all the accounts of trauma and their variations considered, it seems that the percentage of trauma and violence shows little change through time at Pecos Pueblo, with the exception of the low percentages of trauma found in the Coalition burial representation and the high percentage of trauma seen in the church burial group. There is a small spike in trauma during the Glaze 3 ceramic stage in the Classic period as well. Both the Glaze 3 and Church burial samples were considered separately from the periods they are associated within table 48, then placed within the period they are associated with in table 49. The variations between these two tables shows the balancing effects of the high rates of trauma in these particular groups with the low percentages of trauma found in the entire period. It is apparent that there is an increase in trauma and violence from the Coalition to the Classic period of occupation at Pecos. It is worth noting, however, that the brutal violence associated with the church burial group is seen in no other period or burial group at Pecos Pueblo. Therefore, the church burial group is the only population, and possibly time period, that can be directly associated with a drastic increase of violence.

The argument is made by Morgan that there is an increase of head trauma over time (2010; 36). There is an increase of head trauma, however, the change is so small that it would be misleading to make a strong statement about it (Table 50). There is only a substantial increase of head trauma seen in the church group. As the church wasn't built until the early 18th century,

this means that there was no increase in violence at Pecos Pueblo until this time. This is based on the assumption that head trauma is the type of trauma most likely to reflect violence, and that individuals were not buried in the church until after its construction. Table 50 shows the periods and the frequencies of head trauma over time. I did not place the church group into the Colonial period percentages to prove my point.

Frequencies of trauma over time (with Glaze 3 and church burials separated from their period)

Table 48

Period/group			trauma		Total
			no trauma	trauma present	
	Coalition	count	139	6	145
		%	95.8%	4.2%	100.0%
	Classic	count	250	41	291
		%	85.9%	14.1%	100.0%
	Glaze 3	count	103	25	128
		%	80.5%	19.5%	100.0%
	Transitional	count	54	9	63
		%	85.7%	14.3%	100.0%
	Colonial	count	38	4	42
		%	90.5%	9.5%	100.0%
	Church	count	143	33	176
		%	81.2%	18.8%	100.0%
Total		count	968	159	1127
		%	85.9%	14.1%	100.0%

Frequencies of trauma over time (Glaze 3 and church burials included in their period)

Table 49

Period/group			trauma		Total
			no trauma	trauma present	
	Coalition	Count	139	6	145
		%	95.8%	4.2%	100.0%
	Classic	Count	353	66	419
		%	84.3%	15.7%	100.0%
	Glaze 3	Count	103	25	128
		%	80.5%	19.5%	100.0%
	Transitional	Count	54	9	63
		%	85.7%	14.3%	100.0%
	Colonial	Count	181	37	218
		%	83.0%	16.9%	100.0%
	Church	Count	143	33	176
		%	81.2%	18.8%	100.0%
Total		Count	968	159	1127
		%	85.9%	14.1%	100.0%

Frequencies of head trauma over time

Table 50

			Head		Total
			No trauma on head	trauma on head	
	Coalition	Count	143	2	144
		%	98.6%	1.4%	100.0%
	Classic	Count	405	14	419
		%	96.6%	3.4%	100.0%
	Transitional	Count	60	3	63
		%	95.2%	4.8%	100.0%
	Colonial	Count	40	2	42
		%	95.2%	4.8%	100.0%
	Church	Count	149	27	176
		%	84.7%	15.3%	100.0%
Total		Count	1063	63	1127
		%	94.4%	5.6%	100.0%

Conclusions

In this portion of the paper, I will present explanations for the trends seen in the collected data. My research on the history of Pecos Pueblo and the patterning of violence will be used as

evidence for my arguments. Some of the trends cannot be fully explained until more information is available. In the following discussion, I will be highlighting important aspects of my results by time period, then I will provide general conclusions for the entire sample.

The first intriguing trend was the disparity in pathology between Pecos Pueblo and Forked Lighting, as seen in the Coalition period burial sample. Although Forked Lightning was poorly documented, some suggestions can be made to account for the generally healthier condition of the Forked Lightning population. While Forked Lighting was inhabited, it was the largest site in the Pecos River Valley (Morgan,2010: 13). This may be because it was better off in terms of available resources and arable land for growing maize. Additionally, Forked Lighting was located on the west bank of the Glorieta Creek, a desirable place to live (Kessell, 1979). In comparison, Pecos Pueblo was situated on the top of a ridge (Kessell, 1979; 10). Based on the contrasting landscapes, Forked Lightning most likely had more access to resources than Pecos Pueblo, such as more arable land for maize growing (Kidder, 1958). Because Pecos Pueblo was situated on an easily defendable location, inhabitants from Forked Lighting may have migrated there in response to outside conflict (Morgan, 2010: 14; Kessell, 1979: 10-11). During his excavations of Forked Lightning, Kidder noticed that Forked Lightning was built with no regard to defense, which might have been a pull factor in the move to Pecos Pueblo (1958). Although the argument that Forked Lightning was abandoned due to conflict is presented by Morgan (2010), Kidder (1958), and Kessell (1979), it is interesting to note that the burials from this period show the lowest amount for trauma of the entire sample; which does not fully support the hypothesis that Forked Lightning was abandoned due to violence. However, residents from Forked Lightning most likely aggregated in Pecos when the violence was starting to escalate in

the Pecos River Valley. the increase in violence seen in the Classic burial representations at Pecos Pueblo would be exemplary of this.

The Classic period has three trends. First, there were a large number of poor health indicators seen in this period. This could most likely be attributed to the large population that was living in the pueblo at this time. Initial aggregation into Pecos Pueblo and population growth over time would have put a strain on the resources in the area. Variability in the length of growing seasons in the Pecos River Valley and the little attention that was paid to agriculture infrastructure (Welker, 1997), most likely amplified this issue. Second, there is an increase in violence that takes place during this period, which is apparent in the increase head trauma. This violence, most likely with nearby pueblo communities, could be linked to aggression over a limited number of resources; which the poor pathologies of this time would contest to. For instance, competition for resources may have led to conflict over trade with Antelope Creek tribes.

Along with trauma that could be related to violence, there is also an increase in trauma that is more relatable to occupational or everyday hazards in the Classic period. The primary location of this trauma is to the lower extremities. Trauma to the lower extremities is seen in throughout time in the data sample, however, there is a jump in frequency in the Classic Period that is virtually unexplainable. The majority of this trauma comes from the Glaze 3 ceramic stage burial group. Since a great deal of construction on the pueblo happened during this ceramic stage, an increase in trauma to the lower extremities could be related to occupational hazards involved in construction, such as falls (which could also be related to the high frequencies of forearm fractures at this time) or dropping heavy items on the feet. Ancient injuries related to construction hazards warrants further research. There is a wealth of material on modern

construction injuries, however the use of modern tools and construction equipment might cause significantly different sorts of injuries than ancient tools.

Trauma seen in the Transitional period is intriguing, because more than twice as many women show trauma than men. This is the only time period in the data that shows this pattern. It is hard to gauge the cause of the pattern, because there is only one trauma that can be related to violence in this period, which is seen on a male. Other trauma seems to be caused by everyday hazards. As the Transitional period is during the time of Spanish contact, when there were approximately 2,000 residents at the pueblo (Levine, 1999; Kessell, 1979), the general low number of individuals in this burial sample is surprising. It is quite possible that the sample size for the period was too low that the low portion of male trauma in comparison to female trauma could be related to this.

As the church burial group contains most of the burial population in the Colonial period, there are a low number of Colonial period burials that are in association with a ceramic stage (Glaze 6- late/modern). However, separating the data from the church group allows for insight on conflict between Pecos and outside groups. There are several interesting points that pertain to the Colonial burials. First, the majority of the Colonial burial sample found in association with a ceramic stage (as opposed to belonging to the church group) are individuals associated with the Glaze 6 ceramic stage. This means that the majority of these individuals intersect on a time continuum with the Transitional period, as the Transitional period spans from AD1500-1700 and the Glaze 6 ceramic stage from 1625-1700. Second, since the 4th Mission Church at Pecos was built in the first decade of the 1700's, it can be assumed that the church group burials date after this time. Although the 4th Mission Church was built on the same grounds as the 2nd and 3rd Mission Churches, and there could have been individuals buried beneath these older churches,

there is documentation of individuals buried in the 4th mission church (Morgan, 2010; Kessell, 1979). Taking this into consideration, a strong pattern of trauma and violence starts to emerge. There is actually a small decline in trauma and violence seen in the Transitional period and Colonial ceramic stage burial assemblages. This is interesting, because the Spanish and Apache establish contact with Pecos Pueblo at this time. The church grouping, however, shows a substantial increase in trauma, and violence in particular. This is evidenced by the increase of scalping incidents and perimortem trauma that is clearly associated with bladed weaponry. Morgan notes that the trauma found on individuals in the church burial group were inflicted with stone weapons or hatchets, which would be indicative of indigenous conflict (2010; 158). Coincidentally, the Comanche move onto the Plains, just east of the pueblo at this time (AD 1700). I argue that the Comanche are not the sole reason for this increase in violence, but that their presence caused a shift in the social dynamic among themselves, the Apache, Spanish, and inhabitants of Pecos Pueblo that was the tipping point of brutality seen in the historic period. This social shift could be from the intensive raiding, captive taking, disruption of Apache trade with Pecos, Apache loss of land, and ruthless violence on part of the Comanche. It should be noted, however, that aside from belonging to the Colonial period, the church burial group ultimately cannot be related to any particular period of time. This idea is simply based off my assumptions. This is why the church burial group was marked as dating to an indeterminate ceramic stage in Morgan (2010).

Historical accounts of Comanche warfare can be used to solidify the findings attributed to the Comanche in the church burial group. The Comanche were ruthless and talented warriors, whose equestrian skills and war tactics were unmatched. Their attacks were unexpected and random, mirroring that of Guerrilla warfare (Hamalainen, 2008: 65). The element of surprise in

their attacks is demonstrated in the accounts of Pecos inhabitants killed while tending to their fields and chopping fire wood (Kessell, 1979). They used traditional weaponry (such as bow-and-arrows and war clubs), tomahawks made from metal, and muskets (Hamalainen, 2008). The Comanche were also grotesque in the violent acts they committed. In one particular attack "they left behind stripped, scalped, eyeless bodies and placed the beheaded body of a friar on the church altar" (Hamalainen, 2008: 60). In a surface level explanation of what is seen in the Pecos burial sample, the increase in horrific trauma could be directly tied to the Comanche. However, a social commentary can be made about the appearance of the Comanche to the Southwest. Because the Comanche brought an intensity of violence that was never seen before in the Southwest, other groups had to incorporate that intensity in order to survive. For example, attacks on the Comanche from those in a united front against them were just as horrific. One attack was on the scale of a massacre, as every Comanche (an estimated 400 people) was killed (Hamalanen, 2008: 52). Therefore, the Apache could have adopted Comanche techniques in their own raids against Pecos Pueblo as well.

The burial sample from the 4th Mission church is unique. This sample demonstrates the indicators of an episode of violence, as evidence of trauma is represented by all age groups, and the horrific nature of the violence seen on the human remains. For instance, children were found in the church group with perimortem bladed chops to the head. I argue that those seen with trauma in the church burial group are not from a single episode of violence, but from multiple episodes of violence. This argument would fit with the numerous raids that took place at the pueblo. For example, Kessell writes: "The attackers (the Comanche) finally withdrew after killing a dozen inhabitants (of Pecos), including two women, three children, and three Jicarilla Apaches" (372). Clearly, this quote demonstrates the ruthless violence targeted toward anyone

by the Comanche. However, the number of attacks represented by the church group is unknown. For example, Kessell describes one Comanche attack that resulted in the death and burial of 13 individuals in the church (1979). Clues presented in Morgan also infer that many of the church remains were part of a mass grave (2010; 130). It would be interesting to conduct further research on the social effect of having no safety based age or gender during these attacks on Pecos Pueblo.

Morgan (2010) comes to many of the same conclusions about the church sample. She suggests that this group shows the highest proportion of bodies with evidence of violence from any period (2010: 158). She argues that the church sample clearly demonstrates that warfare was a significant factor in the decline of population at Pecos Pueblo (Morgan, 2010: 159). Taking into account that the population at Pecos Pueblo was already decreasing due to epidemics, every life lost in battle took a greater toll on the community. Morgan also offers an explanation for the presence of Europeans in the church burial group. They were most likely Spanish officials or solders that were responsible for monitoring the pueblo (Morgan, 2010: 157). If this is the case, then it could be argued that the church group burials selectively represented those that died in conflict with outside groups. Morgan (2010: 159) also points out that the Comanche and Apache were the reason for the increase in violence in the church burial group; various Comanche attacks are noted in particular.

The data found at the Pecos church allows for a more encompassing view of the historic Southwest. A close analysis of the burials at the church in comparison with the rest of the occupation of Pecos Pueblo allows the realities of raiding on the part of the Apache and Comanche to surface. The historic period encompassed a brutality never before seen at Pecos. The bioarchaeology and the historic accounts fit seamlessly together.

Over all patterns of violence and trauma

Every period at Pecos Pueblo contained trauma that could be related to violence. Violence can also be seen on the remains of every age and sex at the Pueblo. Men, however, were the most targeted group. Because of the constant presence of violence in the bioachaeology that spanned over hundreds of years, Pecos pueblo was most likely in continual warfare throughout most of its occupation. Violence was seen in the Coalition period, but the percentage of violence in the period would not be relatable to the trend of continual warfare. Warfare most likely started occurring around the time of the abandonment of Forked Lighting and aggregation of Pecos Pueblo. The violence created by outside conflict most likely remained at a constant level until the colonial period. It should be noted, however, that the transitional period displayed no increase in trauma despite contact with both the Spanish and Apache, as stated earlier.

The most interesting conclusion in this dataset is the lack of visibility of captives at Pecos Pueblo. They weren't discussed in the data section because they simply weren't visible. Since there are so many historical accounts of captives brought to Pecos Pueblo and sold there, I was convinced that they would show up in the bioachaeology of the site. The fact that they weren't perceivable opens up a discussion on the treatment of captives with heavy social implications. At what point do captives become integral members of society? What are the differences between societies that don't show harsh cruelty to captives or slaves they own versus those that do? In the case of Pecos Pueblo during the historic period, captives didn't show up in the archaeology because they were most likely taken to other locations after they were sold at the pueblo. Historical documents of the baptism of captives into their owners families might also

indicate that their treatment was not severe enough to show up in their remains. This, however, does not apply to captives kept at the site prior to Spanish contact. My hope is that further dialogue on the topic of the treatment of captives in non-state societies, and the social mechanisms that manifest themselves in the treatment of captives will continue in future research.

The research conducted in this thesis of the trauma found at Pecos Pueblo and Forked Lighting allows for further interpretation in the late prehistoric period and historic period in the Northern Rio Grande Valley of the American Southwest. This paper can act as a comparison with future research in the area. The conclusions create a connection between bioachaeology and records from the historic period on the Southwest.

Appendix

Site (variable 1)	Ceramic stage(Variable 2)	age (Variable 3)	sex (Variable 4)	sexsure (Variable 5)
1= Pecos Pueblo	0=B on W	1= child (2-12yo)	1= male	1= positive
2= Forked Lightning	1= glaze 1	2= sub-adult (12-15 yo)	2= female	2=most likely
	2=glaze 2	3= adult	3= unknown	
	3= glaze 3	4= infant (0-2 yo)		
	4= glaze 4	5= 16-19 yo		
	5= glaze 5	6= 20-24 yo		
	6= glaze 6	7= 25-29 yo		
	7= church	8= 30=39 yo		
	8=late/modern	9= 40-49 yo		
	9= indeterminate	10= 50 + yo		

Pathology (Variable 6)	Trauma 1(Variable 7)	trauma 2 (what kind)(variable 8)	Trauma 3 (Location)(Variable 9)
0=nothing	0=no trauma	0= none	0=no trauma
1=arthritis	1= trauma present	1=indeterminate	1=head
2=nutrition def.		2=blow	2=forearm (radius/ulna)
3=infection		3= imbedded point	3=upper arm
4=tumor		4= fracture	4=upper torso (ribs & above)
5=trauma		5= cut	5=lower torso (below ribs)
6=other		6=scalping	6= legs/feet
7=spina bifida		7=dislocation	7=hands/fingers
		8=depression fracture	8=neck
		9=torn ligament/muscle	9=spine
		10=lesion	10=indeterminate
		11=”massive” trauma	
		12=compression fracture	
		13=crack	
		14=greenstick fracture	
		15=indentation	

Trauma 4(location on head)	Trauma 5 (Healing)	Grave goods
0= no trauma	0=no trauma	0=none present
1=frontal lobe	1= indeterminate	1= present
2=L parietal	2=healed	
3=R parietal	3=fatal/perimortem	
4=L temporal	4=infected	
5=R temporal	5=bony growth	
6=L zygpmatic		
7=R zygomatic		
8=occipital		
9=nasal		
10=maxilla		
11=mandible		
12=indeterminate location		
13=R side of face		
14= L side of face		
15= back of skull		
16= top of skull		

Cranial Remains	Postcranial Remains
0=not present	0=not present
1=fragmentary	1=fragmentary
2=partial	2=partial
3=complete/nearly complete	3=complete/nearly complete

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