Ancestral Puebloan social hierarchies at Manuelito Plateau, New Mexico

Sali A Underwood

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ANCESTRAL PUEBLOAN SOCIAL HIERARCHIES
AT MANUELITO PLATEAU, NEW MEXICO

by

Sali A. Underwood
Bachelor of Arts
University of California, Santa Barbara
1986

A thesis submitted in partial fulfillment
of the requirements for the

Master of Arts Degree in Anthropology
Department of Anthropology
College of Liberal Arts

Graduate College
University of Nevada, Las Vegas
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Ancestral Puebloan Social Hierarchies at Manuelito Plateau,

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Masters of Art

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Examination Committee Member

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Graduate College Faculty Representative
ABSTRACT

Ancestral Puebloan Social Hierarchies
At Manuelito Plateau, New Mexico

by

Sali A. Underwood

Dr. Vicki Cassman, Examination Committee Chair
Assistant Professor of Anthropology
University of Nevada, Las Vegas

Using mortuary and osteological evidence this thesis investigates the hypothesis that social hierarchies based on sex and age existed during the Pueblo II and Pueblo III (A.D. 900-1300) periods on the Manuelito Plateau, New Mexico. Mortuary evidence including burial location, positioning, and grave goods was investigated for differential burial treatment within the Manuelito Plateau population sample. Osteological data pertaining to nutritional stress such as stature, dental pathology, and iron deficiency anemia were investigated to determine if differential access to subsistence resources existed. From the six archaeological sites, 99 individuals were recovered consisting of, 22 males, 21 females, and 47 subadults. Though the osteological data did not indicate controlled access to subsistence resources, the mortuary practices indicate that there was possible differential mortuary treatment related to age and sex at two of the six sites, LA31240 and LA121585.
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CHAPTER 1

INTRODUCTION

Statement of the Problem

Questions about southwestern prehistoric social organization have dominated archaeological research since the 1960's (e.g. Hill 1970; Longacre 1970); however, until recently the issue of gender relations has not been addressed. Archaeological debates have continued regarding prehistoric southwestern sociopolitical organization over the past two decades and have included the topics of cultural identity and the hypothesized existence of egalitarian societies (Duff 2002; Lightfoot and Upham 1989; McGuire and Saitta 1996; Mills 2000; Tainter 1996). However, some scholars propose that Ancestral Pueblan society, during the Pueblo II and Pueblo III (A.D. 900 to 1300) time periods, may have been organized in a more stratified manner than previously recognized (Cordell and Plog 1979; Upham 1989; Wilcox 1984). Not until recently have researchers such as Brandt (1994), Neitzel (2000), and Spur (1993) proposed a more complex stratified form of social organization in the prehistoric southwest.

An intriguing but unresolved avenue of research has been the association of gender to status and leadership roles in the explanation of life in the prehistoric Southwest (Neitzel 2000). In an effort to address the issue of gender and status in an archaeological context, this project was designed to test the hypothesis that social hierarchies based on sex and age existed during the Pueblo II and Pueblo III (A.D. 900-
1300) periods on the Manuelito Plateau, New Mexico using mortuary and osteological evidence. An examination of population demographics, health indicators, burial context, and associated grave goods within six research sites were used to test this hypothesis. It was expected that this research would show that older adult females greater than 35 years of age would be represented by greater quantities of grave goods and would have been in better general health than the rest of the population. In turn, these older females would be buried in features such as pit structures or roomblocks as opposed to midden deposits found in many Ancestral Puebloan sites (Hoffman 1993). Though this particular mortuary pattern has never been established in previous archaeological research for this area, there have been indications from archaeological investigations such as Black Mesa (Spur 1993), Mesa Verde (Hoffman 1993), and Chaco Canyon (Akins 1986) that older females may have been treated differently from the rest of the population as seen through burial treatment.

To determine the validity of the hypothesis the following research questions were addressed during this thesis project.

- Are there indications of social hierarchy in the mortuary record within the research sites?
- Are there indications of differential health patterns in the osteological/health record?
- Are there age-related, sex-related, and/or health-related differential mortuary treatments?
- Will mortuary practices help identify ties to other Ancestral Puebloan subcultures?
Archaeological Project

The six Ancestral Puebloan research sites were located in northwestern New Mexico (Figure 1.1). The sites were situated north of New Mexico Highway 264 about midway between Ya-Ta-Hey Post, New Mexico and Window Rock, Arizona near Tse Bonita, in McKinley County on land leased by Pittsburg and Midway Coal Mining Company (P&M) for the McKinley Mine. This research area is within the Southwestern corner of the San Juan Basin and in the Gallup Basin. Called the Manuelito Plateau, the area is on the Colorado Plateau and lies between the Puerco River to the south and the Chuska mountains to the north. On the western boundary lies the beginning of the Defiance Plateau uplift. At an elevation ranging from 6800 feet (2072 meters) to 6820 feet (2080 meters) the sites were situated in piñon-juniper uplands, dominated by piñon, juniper, big sagebrush, western wheatgrass, galeta and Indian ricegrass. The soils were shallow loamy sand or sandy loam with weathered sandstone bedrock outcroppings (West and Neal 1999). The sites were located on Bureau of Indian Affairs-administered Indian allotment land leased by P&M, and were limited to the southern lease lands of the P&M coal mine (Figure 1.2). The project was part of a larger effort to alleviate the potential impacts of coal mining activities on prehistoric sites and burials on Navajo Nation lands, Indian allotment lands, and private lands leased by P&M (West et al. 1998). The project was completed by Steven W. Caurothers and Associates, Inc., (SWCA, Inc.) of Flagstaff, Arizona. The New Mexico Mining and Minerals Department (Office of Energy, Minerals, and Natural Resources) was the lead agency for this project. As part of the original P&M, mine lease agreement; four of the six habitation sites were previously investigated in 1978 by the Office of Contract Archaeology (OCA) based in
Albuquerque, New Mexico. One site was only recorded at the survey level (LA31277) and another site was found later by employees of P&M, and was recorded in 1998 by SWCA (LA121585). Complete excavations of the sites in 1978 were not made due to time and cost limitations as well as research methods popular at the time. Because of this, and the passage of the Native American Grave Patrimony and Repatriation (NAGPRA) law in 1990, the Navajo Nation felt that further investigation to clear the sites of prehistoric human remains prior to mining operations should be completed. Therefore, the emphasis of the SWCA project was to complete the excavation and removal of human remains from the six endangered sites.

Excavations of these sites and the associated human remains were conducted under the authority of SWCA’s Annual Permit to excavate human burials located in any unmarked burial ground in the State of New Mexico (No. ABE-300) and were carried out
in accordance with the approved SWCA testing plan (SWCA 1998). All of the human remains identified during this project were reported to the Navajo Nation Historic Preservation Department (NNHPD). The remains were relocated to the prehistoric burial relocation plot on P&M land and the reinterments were carried out in compliance with the Native American Grave Protection and Repatriation Act (NAGPRA) of 1990, the Navajo Policies and Procedures Concerning the Protection of Cemeteries, Gravesites and Human Remains, (AC-A39-86), and the 1996 Navajo Nation Policy for the Protection of Jishchaa’. These laws and guidelines restricted the methods of archaeological and burial excavation as well as the amount of osteological data that could be gathered during the NAGPRA clearance project.

Eighty-six human remains were identified from the six project sites during the SCWA archaeological investigations (Fox et al. 1997a, 1997b; West et al. 1998, West et al. 1999, West and Neal 1999), and thirteen additional burials were identified and described by OCA (Allen and Nelson 1982). Therefore, 99 individuals from these six sites were identified and used in this research. Of the 86 individuals recovered from the SWCA excavation, there were 49 discrete burials with the rest representing disarticulated burials. Only descriptive archaeological and bioarchaeological information from the SWCA investigation was reported in individual site reports to the Navajo Nation Historic Preservation Office (NNHPD) and the Pittsburg & Midway Coal Mining, Co. All of the sites date to the Ancestral Puebloan periods of Pueblo II and Pueblo III (A.D. 900 to 1300), and were temporally dated using ceramic seriation, radiocarbon, and dendrochronology dates.
Manuelito Plateau Site Descriptions

All six of the habitation sites used in this research study were located within one kilometer (.6 miles) of one another, and the human remains were considered to represent one population. A brief description of each of the sites is presented to establish the archaeological context.

LA31240

Located on private land, this site was first described by the Navajo Nation Cultural Resources Management Program (NNCRMP) (Hartman 1977), later investigated by OCA in 1978 (Allen and Nelson 1982), and finally excavated by SWCA in 1998 (West et al. 1999) (Figure 1.3). The site contained architectural features including a 6-room pueblo; four pit structures (one a probable kiva), two fire pits, and an extensive midden area. The site measured 18 by 30 meters in diameter and included a dense artifact scatter of Klagetoh Black-on-white and Red Mesa Black-on-white sherds. Architectural features indicated that there were at least two occupations of the site for significant amounts of time during the Pueblo II to Pueblo III (A.D. 900-1300) periods. Twenty individuals were recovered during the SWCA excavations at the site; six were from pit structure fill and 14 were from midden context. In addition, eight were primary interments, one was a secondary interment, and eleven were of unknown burial type. LA31247

Located on Indian allotted land this site was originally recorded by the NNCRMP (Hartman 1977) and test excavated by OCA in 1978 (Allen and Nelson 1982) (Figure 1.2). At this time, five rooms in an L-shaped roomblock, two kivas, and a large midden area were identified (Acklen et al.1982). The site measured 40 by 45 meters in diameter and had a wide variety of dense artifacts scattered 30 meters from the roomblock.
Figure 1.2. Map of McKinley Mine and Project Location.
(Hartman 1977). Architectural features located by SWCA include; two pit structures, an extramural surface area, a surface room, six thermal features, and one pit. This site had at least three separate occupations and ceramic dates placed the site between the Pueblo II-III (A.D. 950-1250) periods (Fox et al. 1997). The midden area had been extensively

Figure 1.3. The Research Site Locations.
looted and four sets of human remains were disturbed out of the eight recovered during this phase of investigation. When SWCA completed NAGPRA clearance of the site, 28 individuals were identified; 12 primary burials, 2 secondary burials, and 14 individuals of unknown burial context (Fox et al. 1997a). There were thirty-six individuals recovered from this site, between the two separate investigations, making this the largest known burial sample recovered from a single Ancestral Puebloan site.

**LA31249**

Located on Indian allotted land and first recorded during the NNCRMP survey (Hartman 1977), and then later tested by OCA in 1978, this site measured 30 by 40 meters in diameter and contained collapsed masonry structures and a dense artifact scatter (Figure 3). Architectural features included an eight-room pueblo, a masonry enclosed kiva, two middens and a check dam (West et al. 1998). The site had been repeatedly vandalized and human remains were found on the surface during the OCA and SWCA projects. Based on architecture and ceramics recovered from the site it is estimated that the site was repeatedly occupied between A.D. 925 and 1200 (Acklen et al. 1982: 170-177). Four burials were identified and recovered by OCA, and five additional burials were found during the SWCA investigations. Four of the burials were primary interments, one was a secondary burial, and five were from unknown context.

**LA31277**

This site as also recorded by the survey conducted by the NNCRMP (Hartman 1977), and located on Indian allotted land (Figure 3). Not recommended for Section 106 investigations under OCA’s data recovery plan (Fox et al. 1997a), the site covered an area 15 meters, north to south, by 25 meters, east to west, and consisted of two collapsed
one-room masonry structures (Hartman 1977). Though many artifacts were found on the surface of this site, only Gallup Black-on-white and Chaco Black-on-white pottery types were noted. These ceramic types suggest an occupation date of approximately A.D. 1075-1150 which placed the site within the Pueblo II-III period. A dendrochronology sample collected from the roomblock was analyzed from the 1997 SWCA investigations and produced a noncutting date of A.D. 866 (Fox et al. 1997a). As evident from the architectural data, there may have been up to two separate occupations or at least one remodeling event. Architectural features identified by SWCA include a five-room L-shaped roomblock, two kivas, seven extramural slab-lined fire pits, midden, two pit structures, a courtyard, and several pits. Of the eighteen individuals recovered from the site, eleven were primary burials and seven individuals came from unknown context.

This site was also located on Indian allotted land and was first recorded by the NNCRMP (Hartman 1977) (Figure 1.3). The site was partially excavated by OCA in 1978. It had one large midden, a nine-room pueblo, and a stone lined kiva encircled within the walls of the pueblo that made up the site architecture. This is one of the largest kivas encountered during the project (Acklen et al. 1982: 22). The site boundaries measured 35 by 25 meters and included a portion of the midden that was vandalized prior to the 1978 excavations. From the architectural features and ceramic artifacts from the site, it was determined that the site was in use between A.D. 925 and 1220 and was occupied at least two different times. Red Mesa Black-on-white, Gallup Black-on-white, and Puerco Black-on-white ceramic types characterized the earlier artifact assemblage,
and the later occupation ceramic assemblage was mostly made up of Chaco-McElmo Black-on-white (Fox et al. 1997b). Ten primary burials, one secondary burial, and three individuals from unknown context were found at the site.

LA121585

This site was discovered on private land by P&M employees and recorded by SWCA in 1998 (Figure 3). The site measured roughly 38 by 18 meters and consisted of a large midden, pit structure with subfeatures including a turkey burial, an extramural slab lined fire pit, and two primary human burials. The ceramic artifacts indicated that the site was occupied for an extended period of time during the Pueblo II period, about A.D. 950-1050. The presence of one human burial within the pit structure fill suggests multiple occupations. Since a drainage canal impacted the site to the south and west of the site, the probable associated pueblo was not found during this investigation. The presence of the turkey burial and a high percentage of corn pollen on the floor of the pit structure suggested that there might have been a ceremonial function to the site.

Manuelito Plateau Archaeology

Multiple survey and data recovery projects have taken place within the McKinley Mine area (Allen and Nelson 1982; Eck 1982; Fox et al. 1997a and 1997b; Gilpin et al. 1994; Hartman 1977; Kauffman 1985; and Scheick 1991; West et al. 1998; West et al. 1999; West and Neal 1999) located on the Manuelito Plateau. Since the Gallup Basin has served as a cross roads for centuries, it has been influenced by many cultural entities. These cultures include the Kayenta to the north and west, the Chacoan from the San Juan
Basin and Chaco Canyon to the north and east, Mesa Verde to the north, and the Rio Puerco Valley to the south and west, and the homeland of the prehistoric Cibola Ancestral Puebloans (Zuni) to the south.

During the Pueblo II period (A.D. 900-1100), both permanent and seasonal occupations were present in the research area that indicated an increase in the population with large communities in some areas and greater overall site densities (Scheick 1985). In the neighboring Gallup Basin and Manuelito Canyon areas, sites were made up of clustered roomblocks surrounding pit structures, with a few sites that exhibited Chacoan outlier architecture and site patterning (Fowler et al. 1987; Scheick 1985). Subsistence was based on agriculture as well as hunting and gathering. The presence of nonlocal goods and the appearance of pit structures/kivas at habitation sites indicated an extension of economic and social ties outside the McKinley mine area during this time (Cordell 1982; Gilpin et al. 1994:15), as well as an increase in population size (Cordell 1982).

The number of moderate-sized archaeological sites increased in number during the Pueblo III (A.D. 1100-1300) period (West and Neal 1999). It was during this time that Chaco Canyon and the large Chaco-related communities in the eastern Red Mesa Valley were abandoned (Scheick 1985). Ceramic assemblages from the research area suggested ties with Mesa Verde and the northern San Juan, Puerco River and the Little Colorado River to the south and west, and Acoma to the east. Sites became more seasonal and temporarily occupied and the number of sites decreased in this area (Kauffman 1985, Nelson and Cordell 1982). The abandonment of the Manuelito Plateau occurred around A.D. 1300 (Cordell 1982).
Osteological Data

As a result of this project, osteological data from bioarchaeological contexts at Manuelito Plateau were gathered. These data included the identification and inventory of the skeletal portions present, the condition of the bone material, the age, sex and stature of the individuals recorded, and gross pathologies; including porotic hyperostosis. Dental observations focused on the presence of pathologies including cavities, abscesses, periodontal infection, and the presence of calculus and dental wear. The skeletal and dental data were recorded on osteological analysis forms generated especially for this project and modeled after the Anasazi Heritage Centers NAGPRA Inventory forms (Underwood and Thomas 1996), and the Standards methods (Buikstra and Ubelaker 1994) (Appendix I). The osteological analysis was conducted by myself, in the field, directly after the excavation of the remains, per the Navajo Nations Jishchaa' guidelines. A descriptive summary of the burials was included in the reports generated by SWCA, with an appendix of the osteological analysis data forms.

To be able to address the thesis questions the data that was originally gathered by myself from the SWCA project were examined using the osteological variables of age, sex, stature, porotic hyperostosis and dental caries. These data were used to determine demographic distributions within and throughout the population. An age, sex, and general health profile for each individual was then compared to the archaeological data. These data were examined to determine differential treatment patterns relevant to social organization among the Ancestral Puebloan population of the Manuelito Plateau.
Thesis Organization

A brief archaeological regional and cultural overview of the Ancestral Puebloan subcultures that surrounded the research area and the prehistoric Manuelito Plateau during the Pueblo II and Pueblo III periods is presented in Chapter 2. Theories relevant to the research such as paleodemography, paleopathology, gender, and mortuary studies are reviewed in Chapter 3. These theories specifically relate to the investigation of status among prehistoric populations of the Southwestern region. Chapter 4 presents the basic analytical methodology and the materials used in the project. Chapter 5 presents the results of the osteological and mortuary analysis, and Chapter 6 contains the interpretation, conclusions, and directions for future research. This chapter emphasizes the application of the data to the proposed hypothesis, how the findings related to previous studies, and the significance of the project within the field of bioarchaeology. Appendix I provides an example of the data gathering form used in this study. Appendix II is a table of burials with grave goods.
CHAPTER 2

ARCHAEOLOGICAL REGIONAL AND CULTURAL OVERVIEW

Introduction

In an effort to understand the project area where the study sites were located, an overview of the archaeology of the region is presented. From archaeological investigations within the Ancestral Puebloan region, subcultures have been identified. The inhabitants of these regions were found to be distinct in prehistory and, in some cases, have remained so even to this day.

Through the review of archaeological evidence, the possible cultural influences on the study area may be recognized. Cultural influences are reflected in site structure, architecture, material culture, and the mortuary treatment of these regions. The influence from four subcultures might be visible at the Manuelito Plateau sites. These include the Mesa Verde, Chaco Canyon, Cibola (Puerco River Valley), and Kayenta subcultures (Figure 1.1). Archaeological comparisons between these various prehistoric groups, culturally, temporally, and geographically, serve to provide the necessary information to recognize the possible cultural influences on the study area. In the interest of relevance to the study sites, only Pueblo II through Pueblo III periods were reviewed.

Also presented is a summary of Manuelito Plateau environment and archaeology. Since there was no specific description of the site patterns for the Manuelito Plateau area
in the literature, the Manuelito Canyon District located 12 km to the south, as presented in Weavers (1978) dissertation, is used to characterize the Pueblo period sites for this region.

Environment of Manuelito Plateau (McKinley Mine Area)

Centrally located between the Mesa Verde, Chacoan, Kayenta, and Puerco regions the study area is located on land leased by the McKinley mine. The Mine is located within the Southwestern corner of the San Juan Basin and in the sub-basin of the Gallup sag, which is also known as the Gallup Syncline between the Defiance and Zuni Uplifts. This area is a series of flat-topped hills outlined by 7000-foot elevation. Called the Manuelito Plateau, this area lies between the Puerco River to the south and the Chuska mountains to the north. On the western boundary lies the Defiance Monocline, this is a sharply defined uplift that binds the San Juan basin. The Mine is located near the northern end of the Manuelito Plateau and south of the most southern flank of the Chuska Mountains (Hewett 1982:22).

The landscape in this region is composed of mesas and ridges, buttes, benches, and cuestas. The elevation ranges from 8700’ (2653 m) in the Chuska Mountains to less than 6000’ (1830 m) in the alluvial drainage bottoms (Hewett 1982:28). Washes carry seasonal water and there are no perennial streams in the area. Numerous springs were maintained by ground water discharged at the base of the Chuska Mountains (Hewett 1982:41).

The upper slopes and ridge tops have altitude dependant vegetation such as Piñon and Juniper trees with sagebrush and other shrubs dominating the lower altitudes. There
are many rocky outcroppings and poorly developed thin layers of soils in the forested areas. Clay, silt, and fine sandy soil could be found in the alluvial valleys and channels. The northern portion of the Manuelito plateau, where the McKinley Mine lease is located, was covered by residual and alluvial soils. Menefee coal seams were exposed on the ridges and occurred in low-lying areas under surface soils.

Though variable climates exist on Manuelito Plateau, the average precipitation amount is 9.7 inches over a 50-year period (1920 to 1970) with summer providing the most rainfall (Hewett 1982). The temperature can range from an average of 48° F in the summer to an average high temperature of 90° F in the summer. In the winter, the average low is 18° F with a high temperature of 47° F. These temperatures are also affected by the persistent winds, which average a velocity of 10 mph (Dames and Moore 1974), with the peak in the early to mid-spring when the winds exceed 50 mph.

Archaeology of Manuelito Canyon

Since there were no archaeological overviews of the Manuelito Plateau area, the Manuelito Canyon District located 12 km to the south, as presented in Weavers (1978) dissertation, is used to characterize the Pueblo period sites for this region. In the Mine lease area population size peaked during the Pueblo II period and in the Manuelito Canyon District population estimates suggest that during the Pueblo III period it reached its greatest population peak (Cordell 1982, Weaver 1978). Cordell (1982) also goes on to suggest that the prehistoric population of the Mine lease area left and went to live in the Manuelito Canyon District due to over-utilized resources and unproductive agriculture caused by a drought in the Manuelito Plateau region.
During the Pueblo II period in the Manuelito Canyon, specifically A.D. 1000 to 1100, prehistoric sites were characterized by small pueblo units with pit structures (possible kivas) and midden areas. The pit structures and trash areas were usually located either down slope or to the southeast, south or east of the habitation area. There were rarely more than 10 rooms in a pueblo, but up to 20 rooms have been recorded (Weaver 1978). Pueblo room arrangement was variable, but the most common forms were L-shaped, F-shaped, and U-shaped. Other associated features of the site included storage pits and rooms, bedrock mortars and grinding areas, terraces, rock alignments, and rubble mounds (Weaver 1978:185). Not only were pueblos occupied during this time, but also pit structure villages were present.

Community patterns for the Pueblo III (specifically A.D. 1100 to 1200) period were very similar to the Pueblo II time, but on a larger and more complex scale. Sites with multiple room blocks and multistories appeared for the first time with associated pit structure, storage features, and trash middens. Pit structure villages, rock shelters and bi-walled structures were also still in use at this time.

During the Late Pueblo III (A.D. 1200 to 1300) period, the larger pueblos were still present with the beginning of the central unit and smaller surrounding satellite room block pattern observed (Weaver 1978). This was also when enclosed pit structures and associated features such as plazas within a massive compound wall became prevalent. Kiva-like structures and “Great Kivas” also become common during this period.

From A.D. 1300 to 1400 (Pueblo IV) large pueblos of greater than 10 rooms were well established with multiple room blocks, associated pit structures, and trash areas. Pit
structure villages, rock shelters, or *jacal* structures were not in use during this time (Weaver 1978). By the end of this period, the area was abandoned.

To estimate the demographic pattern for an area of research, archaeologists use burial patterns. The comparison of the number of rooms recorded, or the estimate of the duration of habitation at the site is rarely reflected in the number of actual human burials recovered from a site. This under-representation of burials, is considered a characteristic of Ancestral Puebloan sites in general (e.g. Roberts 1931; Vivian and Mathews 1964; Judge 1979; Cordell 1982). There are many factors that can contribute to this phenomenon including; methods of excavation and investigation, vandalism, environment, soils, burial treatment, and the inability to identify disarticulated human bone in disturbed (prehistoric or modern) context. Of course, a combination of these factors can also be responsible for the lack of burials recovered from Ancestral Puebloan sites.

Discussed in detail in the results chapter will be the mortuary treatment for the six sites from this study. In general, the human burials at Manuelito Plateau were typically placed in earthen pits in the midden deposits with a few individuals placed in structure fill or on floors, including rooms and pit structures. Not all burials had grave goods, but the most commonly found item was the ceramic vessel. Other items of interest included flaked tools (including projectile points), ground stone, bone tools, and ornaments including turquoise, crystals, and minerals (Fox et al. 1997a; Fox et al. 1997b; West et al. 1998; West et al. 1999; West and Neal et al. 1999). The burials were found in a flexed or semiflexed position, and were most commonly placed on their backs with some individuals in their sides.
Archaeology of Surrounding Regions

*Mesa Verde*

Located in the Southwestern corner of Colorado this cultural area included not only the well-known Mesa Verde Plateau, but also archaeological projects conducted in the Dolores River Valley in conjunction with the Dolores Archaeological Project (DAP). Mesa Verde has been studied for many decades and is still the subject of ongoing research through the National Park Service.

Sites from the Mesa Verde area during Pueblo II (A.D. 900 to 1100) were small and widely spaced. They were most commonly located on low ridges on mesa tops and talus slopes above 5000 feet in elevation (Rohn 1989).

Early Pueblo II (A.D. 900-1050) is a designation often used when discussing the Mesa Verde region. During this time, sites had few surface rooms with associated circular pit structures that were possible kiva features. Ventilator shafts, pilasters, hearths, and four-post roof supports were found in some of the kiva features. Typical habitation sites during this period had one or two living units including a kiva feature, surface rooms, a small pit structure used to process corn, and a midden area. In addition, pits, ramadas, and/or enclosed stockades have also been found at habitation sites during this time (Lipe and Varien 1999). Great Kivas were found throughout the region at some sites and may have served as central features for the communities (Lipe et al. 1999).

Burial practices in the Mesa Verde region during the Pueblo II period consisted of flexed or semiflexed individual burials with few or no associated burial goods. This was especially true for the Early Pueblo II period when locally produced ceramics were the most frequent burial offering (Lipe and Varien 1999). During excavations conducted as
part of the Dolores Archaeological Program, Pueblo II period burials were recovered from the fill of architectural features; however, this patterning may have been biased by the project’s excavation methods. Since the focus of the project was on the architecture of the Pueblo I period, midden areas and extramural features were not investigated as thoroughly as the architectural features, especially at Pueblo II sites. This research methodology also produced an age-related demographic bias of more adults than subadults (Stodder 1986:353). In comparison, in other sites outside of Mesa Verde proper, burials were found within midden deposits with few or no associated grave goods (Brew 1946; Hayes and Lancaster 1975; Robinson 1976; Robinson 1982). Stodder (1986) also found that burials were orientated predominantly to the north and east with no sex-related locational patterns observed. Ceramics were the most common grave goods, with bone tools, beads and stone tools also found in association with the burials.

The Late Pueblo II (A.D. 1050-1150) period was characterized by architecturally diverse and geographically widespread habitation sites, especially in the western portion of the region. Though most prehistoric residents lived in dispersed farming hamlets, some aggregated into village sized habitation sites (Cordell 1997). After A.D. 1075, Chaco-related Great Houses were present (Lipe et al. 1999). It was at these Great House sites that there was evidence of substantial status differentiation. This could be seen through the treatment of the dead. One example is from Dominguez Ruin, a small habitation unit located near the Escalante Great House. An adult female was buried with many associated artifacts suggestive of differential burial treatment and status. These grave goods included three elaborate pendants, six nonhuman humerus scrapers, 6,900 turquoise, jet and shell beads, and three turquoise and shell mosaics including an inlaid
shell piece carved into the shape of a frog (Lipe et al. 1999). From this and more archaeological evidence, Lipe et al. (1999:259), concluded that the late Pueblo II period saw a clear representation of social differentiation and hierarchy not seen either earlier or later in the Pueblo tradition.

Late Pueblo II kivas were stone lined and were associated with sandstone masonry surface rooms. Water features such as check dams, reservoirs, and field houses were common during this time. Cordell (1981) and Varien et al. (1996) suggested that there was a drop in population, possibly due to the Chaco influence. Three types of corrugated ceramics were diagnostic to this region and include Mancos Gray, Mancos, and Dolores. New decorated ceramics seen at this time were Cortez and Mancos Black-on-white. Trade wares such as Puerco and Tusayan Black-on-red, Sosi, Dogoszhi, Gallup, and Escavada Black-on-white were also present during the later Pueblo II period (Cordell 1997).

At the beginning of the Pueblo III (A.D. 1100 to 1300) period, population size increased. Small and dispersed sites were the norm, with large aggregate settlements or Chaco Great Houses within the local area. As described by Cordell (1997), sites were located near canyon rims, in rock shelters, on talus slopes and in canyon bottoms. Kiva features were keyhole shaped and usually enclosed by sandstone rooms. Two storied roomblocks and tower features were more common at this time. Other features found in association with these sites were check dams, reservoirs, field houses, and shrines. Utility ceramics such as Mesa Verde corrugated and Mesa Verde Black-on-white were found along with trade wares such as Wingate Black-on-red, Chaco Black-on-white, and Tusayan Polychrome.
In the Pueblo III period, there was an overall lack of trade goods suggesting that
during this period residents had little contact with outside culture groups. Architectural
differences such as D-shaped structures and tower sites may have been an indication of
social differentiation. However, the absence of burials with elaborate offerings and the
scarcity of recovered unique personal items such as jewelry do not support the
supposition of the existence of social hierarchies (Varien et al. 1996).

Like the Pueblo II period, the Pueblo III period has been referred to in terms of
Early and Late time frames. This was due to changes seen through the archaeological
record. Early Pueblo III (A.D. 1150-1225) habitation sites became larger over time and
had multiple room units. Community centers became larger suggesting an increase in
household size and settlement clustering. It remains unclear whether or not the Chaco
Great Houses were continuously occupied into the middle 1100s or if they were
reoccupied in the late 1100s after disuse, or if they remained unused (Lipe et al. 1999).

By Late Pueblo III (A.D. 1200 to 1300), the location of habitation sites at Mesa
Verde proper shifted from mesa tops and low land areas to large rock shelters (Cordell
1997). These sites, though restrained by rock shelter formations, were multistoried and
varied in size and form. Late Pueblo III habitation sites were mainly located in or near
These communities were sometimes built as cliff dwellings or on open canyon rims with
a few sites that contained tower features, which were located near reliable springs.
Preservation of organic materials is one of the archaeological benefits of rock shelter
habitations. Items such as leather moccasins, yucca sandals, willow mats, prayer sticks,
and fire drills have been recovered along with corrugated and Black-on-white Mesa
Verde pottery in the form of dippers, canteens, mugs and ollas. Most of these items were produced locally, with little evidence of imported goods at this time (Cordell 1997).

On the outer borders of the Mesa Verde region there was an increase in population density as seen through the increase in site size (Cordell 1997). Defensive architecture such as towers and perimeter walls were constructed during this period, and sites were located in defendable positions such as canyon heads and rims. This concern with defense suggests that there was a threat of raids or attacks during this time. By the late A.D. 1270s, the population decreased and by A.D. 1280, there was evidence of minimal architectural construction (Lipe et al. 1999).

During the Pueblo III period, burial practices were similar to those of the previous period, with primary interments the most common type of burial. Individuals were placed in the flexed position, and interred in pits located in midden deposits or in rooms and pit structure fill and on floors. Grave goods have been associated with both secondary and primary types of inhumations though secondary burials were rare and usually indicated disturbance by a later population. Although, most burials from this period do include associated funerary items, when grave goods were encountered they usually consisted of locally produced utilitarian ceramic vessels, jewelry made of stone or shell, and on rare occasions, specialty items such as non-local ceramic vessels, projectile points, pigment minerals, crystals, and mano’s (Eddy 1966; Stodder 1986; Rice et al. 1997).

**Chaco Canyon**

Since 1971, the regional influence of the Chaco phenomena has been intensely studied, and this influence has been determined to be unique, instead of typical, to the Southwest (Vivian 1990). The Ancestral Puebloan sequence at Chaco Canyon was the
most archaeologically abundant and notable due to the large architectural ruins and sites, suggestive of a complex social organization and extensive regional influence.

During the early Pueblo II (Bonito) period, A.D. 920-1020, site types were diverse, but the number of sites slightly decreased. However, the number of rooms per site increased and that in turn suggests that the population increased (Cordell 1997). Though most of the sites remained small with straight lines of double-tiered living and storage rooms, there were three sites (Una Vida, Pueblo Bonito, and Peñasco Blanco) that had rooms of more than one story with wall construction of higher quality craftsmanship (Judge 1989). These sites may have served as local centers for redistribution and gathering of agricultural resources (Judge 1989). Red Mesa Black-on-white and Tohatchi Banded were some of the diagnostic ceramics found at this time in the canyon (Cordell 1997).

The major town sites of Chaco were completed during the Classic Bonito period (A.D. 1020 to 1120), which is part of the Pueblo II Pecos classification chronology. These sites included multistoried famous ruins such as Pueblo Alto, Kin Kletso and Pueblo Bonito. It was during this time that soil and water control features were constructed and a system of roads built that linked the canyon with multistoried Chaco-style pueblos located outside of the canyon. Village sites were still small and single storied, and similar ceramic types were found at both large and small sites (Cordell 1997). These ceramic types consisted of corrugated utility ware and Black-on-white wares such as Escavada and Gallup (Cordell 1997).

The population in Chaco Canyon declined during the late Bonito phase (A.D. 1120-1220). During this time, there were few new building episodes and little evidence
of the detailed Chacoan masonry techniques distinctive of the previous period. Imported ceramics from the Chuska area, Tusayan or Hopi area, and the Mesa Verde area were dominant (Cordell 1997).

Between A.D. 1220 and A.D. 1300, a Mesa Verde phase can be distinguished within Chaco Canyon. Cave sites and the tops of buttes were occupied in addition to the more traditional valley locations. Burial patterns and the presence of St. John’s Polychrome and Mesa Verde Black-on-white ceramics indicated an increased economic interaction with these areas (Toll et al. 1980). By A.D. 1300, Chaco Canyon was no longer occupied (Cordell 1997).

Since burial patterns in the Chaco Canyon area differ between large and small sites (Akins 1986), only the small sites were included in this summary. The small sites provided a more useful comparison to this study.

Due to the strict criteria used for analysis, small sites with burials from the Early Pueblo II period (A.D. 900-1050) were not well represented in Akins (1986) synthesis. From three sites, seven burials were described.

“Two of the males had no offerings and the third had only a quarter of a bowl. One child had a single small bowl; the other had two miniature bowls and a miniature pitcher as well as two ground stone items. The two females had the most objects. That from Be 51 (60/29) had four vessels—a Red Mesa bowl and pitcher, a corrugated jar and a neck-banded jar; 29SJ627 Burial 1 was accompanied by two Red Mesa bowls, a pitcher, an olla fragment, and 10 well-made projectile
points. The latter was also the only room burial, which may suggest that more care was given to her interment than to that of others in the sample.” (Akins 1986:87)

Four of the five burials from these small sites were placed in the semiflexed position, one was extended, and all were on their backs. Four of the burials had stones or slabs placed over the body or parts of the body; unfortunately, Akins does not elaborate on which burials had the stones. The orientation of the head was variable and four of the burials were found within the midden deposits of the sites.

Since the burials presented in Akins 1986 report were a sample of those internments that could be chronologically place from past excavations, there was an inherent bias towards inhumations with grave goods. The skeletal remains that had little or no documentation and no grave goods could not be placed in context and were therefore not used in the analysis. This produced a significant bias, but the patterns of those burials with grave goods was still of interest when comparing like burials from other regions and sites.

Late Pueblo II (A.D. 1030-1150) small sites in Chaco Canyon include a much larger sample size (n=66), and represent a greater variety of patterns (Akins 1986). Burials were found in rooms, middens, and extramural areas. Most burials were flexed or semiflexed, though a few were placed in the extended position. Flexed individuals were positioned within the grave either on the back, or on the right or left side. Head orientation was diverse with all directions represented, but east and west were more prominent. Ceramic vessels were the most common associated grave good, and miniature vessels were more often found with infants and children than with adults. Other items
that were found with burials included; turquoise, corn cobs, woven mats, feather cloths, bone tools, flaked and ground stone, red pigment, malachite, basketry and a sandal (Akins 1986:94). The greater variety of associated objects found with the burials from the Late Pueblo II period when compared to the Early Pueblo II period probably indicated either personal possessions or personal achievement (Akins 1986:98).

Early Pueblo III (A.D. 1100-1175) burial patterns suggested that positioning was varied, with infants and children buried in the extended position more often than adults. Adults were more often found in the flexed or semiflexed position and on the back, or on either side. Ceramic vessels were the most common grave good. Other items found with burials included ground stone, bone, tools, basketry, and few flaked stone materials (Akins 1986:102).

By the end of the Late Pueblo III (A.D. 1175 and later) period, few burials were found at Chaco Canyon. Burials were semiflexed, placed on the back, side, or face, and located in room floors or subfloor. A pattern of infants buried to the west and adults to the north can be seen in the small sample size (n=11) (Akins 1986). Ceramic vessels and sherds represented the most common associated grave good. Other items included stone slabs, seeds, turkey carcass, matting, a turquoise chip found with an infant, and a quartz crystal found with an adult male (Akins 1986:105-107).

Overall, midden burials slowly decreased over time, and extended burials became rare in the small sites of Chaco Canyon. Placement of the body varied through time and the orientation of the head to the east increased in frequency until Late Pueblo III (Akins
Chaco Canyon continues to be the focus of many on-going studies. The influence that the Chacoan system had on regions outside of the area is still of great interest to the modern researcher.

*Cibola (Western Puerco and Zuni)*

In the Puerco region, the Pueblo II period is split into three chronological phases: the Red Mesa, Wingate, and Holbrook (Figure 2.2). These phase differences were based upon ceramic differences and architectural changes.

The Red Mesa Phase dates from A.D. 900 to 1000 and had a ceramic assemblage that consisted of Red Mesa Black-on-white and lesser amounts of Puerco Black-on-white. Indented corrugated gray wares, Mogollon Brown wares, such as Woodruff Brown and Woodruff Smudge Brown were also part of the utility assemblage (Fowler 1994). During this phase, there was an expansion of sites into new areas and an increase in the number of sites within the region (Irwin 1997). The first appearance of Great Kiva features and Great House architecture was also seen at this time (Gilpin 1993). Though the pit structure was common at many of the sites, aboveground habitations constructed of stone and adobe masonry were also present. Pit structures were circular and often had benches located high on the walls just above the ground surface. Rectangular pit structures with four-post roof supports were also typical of the Red Mesa phase (Irwin 1997).

During the Wingate phase (A.D. 975-1075), the ceramic assemblage consisted of Puerco Black-on-white and Black-on-red, Gallup Black-on-white, and Wingate Black-on-white (Irwin 1997). The population continued to expand, with Great Kiva features and Great House sites more common and occurring at regular intervals throughout the Puerco River valley (Gilpin 1993).
Pueblo structures were oriented toward an open plaza. Trash middens were south or southeast of the plaza and kiva and roomblocks were constructed in U- or L-shaped formations (Irwin 1997). Pit structures were circular, rectangular, D-shaped, and keyhole-shaped with a variety of posthole and roof patterning. There was also the introduction of masonry elements such as lower placed benches, varied types of fire pits, and deflectors. The presence of Sipapu features was also noted during this period (Irwin 1997:26).

The Holbrook phase (A.D. 1075-1100) is archaeologically defined by the appearance of Holbrook Black-on-white ceramics and the beginning of the Winslow branch of the Ancestral Puebloans (Colton 1939; Gumerman and Skinner 1968). Other ceramic types present include Little Colorado and Tusayan White wares, with fewer intrusive White Mountain Red wares and Cibola White wares (Irwin 1997).

Sites were usually small and had three or four pit structures and surface storage rooms (Irwin 1997). The lack of hearths in the surface rooms suggested that these were used mainly as storage rooms. There have been no reported kiva features found in association with the sites in this temporal phase.

The Pueblo III (A.D. 1100-1300) period is divided into two phases: Houck and Kintiel. From A.D. 1075 or A.D. 1100 to A.D. 1250, the Houck phase includes newly diagnostic ceramics types such as, St Johns, Querino, and Houck polychromes (Carlson 1970). There is a continuation of Gallup Black-on-white, Puerco Black-on-white and Wingate and Puerco Black-on-red pottery types. Intrusive pottery types include Little Colorado, Kayenta, Mesa Verde, and Mogollon regions (Irwin 1997).

Single story pueblos and multiple forms of pit structures were present in this phase. Multiple kivas were often keyhole-shaped with southern recesses, pilasters, and
surrounding benches. Smaller pit structures were common and rectangular in shape with corner vents, and the occasional masonry lined fire pits (Irwin 1997). During this phase, Great Kivas and Great Houses continued to be occupied as community centers along the Puerco River and in the Cibola region (Fowler et al. 1987; Gilpin 1993; Kintigh 1994).

The Kintiel phase (A.D. 1250-1325) exhibited the introduction of Klageto Black-on-white and Klageto Polychrome pottery types (Irwin 1997). Yellow and orange wares, present in the region after A.D. 1250, included Klageto Black-on-orange and Kintiel Black-on-yellow. After A.D. 1300 polychrome types including Gila, Pinedale, Awatovi, Heshotauthla and Kwakina were present (Irwin 1997:27).

Architectural features such as dance plazas and kivas with roomblocks were part of the site structure. Local populations dispersed, and nucleated Great House communities became more like centralized aggregated pueblos mirroring the pattern found on the Colorado Plateau. The Great Houses along the Puerco River were abandoned around A.D. 1250.

For the Pueblo II/III period, burials for the Puerco River/Cibola region were usually oriented to the east, in the flexed position, and on their backs. At one site there was an example of a shift over time in burial location from cemetery pit burials in the midden, to the placement of burials within feature fill such as bell shaped pits and structures (Underwood 1997). Ceramic vessels were the most common item associated with the burials. Other items included stone and shell ornaments, matting, cordage, bone tools, ground stone, and lithic tools (Hartman 1986; Herrmann 1993; Lippmeier 1994; Miller 1994; Underwood 1997).
Kayenta

The San Juan and Colorado rivers to the north and west, the Little Colorado River to the south, and the Lukachukai Mountains to the east geographically bound the Kayenta branch of the Ancestral Puebloans. Though occupied as early as the late Archaic period (2000-1000 B.C.) it was by the inception of the Basketmaker II period (1000 B.C.-A.D. 550) that culturally identifiable differences from the Eastern Ancestral Puebloan groups appeared (Dean 1996). These differences can be seen in the ceramics, architecture, site structure, and social organization. There was also a significant time lag that separated the development of the Kayenta from the Eastern Ancestral Puebloan groups. Not until A.D. 1250 did large sites and hierarchical settlements develop in the region, which was 300 years after they developed in the Chacoan and Mesa Verde regions.

Kayenta habitations consisted of small pueblos built of simple masonry and jacal. The granaries were closed and a unique living room feature called the “entry-box” was present for the first time in the architecture (Dean 1996). There were also a wide variety of kiva features and residential pit structures present in this region during the early Pueblo occupation.

The Pueblo II (A.D. 975-1150) period was represented by a change in habitation architecture. Site structure shifted from pit structure villages to “unit pueblos” which consisted of a block of masonry and jacal surface rooms. These living and storage rooms faced a plaza with a kiva, or subterranean structure, and a trash mound in association. These pueblo units occurred as dispersed homesteads throughout the area as opposed to the Pueblo I aggregation of communities (Dean 1996). During this period, the population and region of the Kayenta expanded to north of the San Juan River and south of the Little Colorado.
Colorado River. Ceramic types affiliated with this time included the Tusayan Corrugated, Moenkopi corrugated, and the Kayenta Black-on-white (Cordell 1997). Trade materials declined and the area appears to have been isolated in the Pueblo II period.

During the Pueblo III (A.D. 1150-1300) period, there were significant changes in site settlement dynamics. From A.D. 1150 to 1250 the settlement pattern changed to large, aggregated interdependent communities seen in the Tsegi phase (Dean 1996). The peripheral expansion evident in the previous period was no longer evident, and in fact, a withdrawing to the heartland near Black Mesa, Arizona, seems to have taken place. Populations aggregated to areas where farming was better and water was more plentiful. In the Tsegi phase (A.D. 1250-1300) habitation sites consisted of room clusters with living rooms, storerooms, granaries, and kiva features. The kiva features were masonry-lined and keyhole-shaped (Cordell 1997). Each of the large communities had residential sites clustered around a single central pueblo, but there was no evidence of imported items in disproportionate numbers or in association with human burials that would suggest differential access to goods.

Though there is archaeological evidence suggesting that the Kayenta withdrew from neighboring Ancestral Puebloan groups resulting in a decreased influence within the Ancestral Puebloan region, there was also evidence of an increased influence by Mesa Verde in the Kayenta culture. This influence is seen in the architecture and ceramic types found at the sites within this region. The Kayenta area was vacated between A.D. 1290 and 1300, but the Kayenta cultural patterns continued to the south in the middle Little Colorado River drainage area.
In the Kayenta region burials were most commonly located in the midden areas, but they have also been recovered from kivas, pit structures, and bell-shaped pits (Spurr 1993; Jacobi 1986; Berry 1983). The burials were placed in flexed, semiflexed, and extended positions, with the head oriented mostly in the north or south direction. The most common grave good was the ceramic vessel. These vessels represented utilitarian bowls, jars, and utensils, and were not produced especially for internment. Other items found in association with burials were; stone beads, ground stone, flaked stone, minerals, bone tools, and shell (Spurr 1993; Jacobi 1986; Berry 1983).

Summary

Through review of the available archaeology of the four (Mesa Verde, Chaco, Cibola, and Kayenta) Ancestral Puebloan cultural groups in close proximity to the Manuelito Plateau study area, distinct cultural patterns become noticeable. Though the site organization of these areas was similar, differences in architectural patterns, construction methods, feature patterns, mortuary treatment, and artifact assemblages distinguish the cultural groups. Variations in these cultural characteristics suggest that through time there were recognizable cultural influences between the different Ancestral Puebloan subcultures.

An example of these influences can be seen in the presence of the distinct Chacoan building methods in the Mesa Verde region, along the Puerco River, and in Manuelito Canyon, but not in the Kayenta area or on Manuelito Plateau. This Chacoan
influence was also reflected in the burial treatment. The presence of exotic grave goods suggests differential mortuary treatment and may indicate that social differentiation existed in the Mesa Verde region during the Pueblo II period.

It was through archaeological comparisons that the various prehistoric subgroups became evident in past studies of ancestral Puebloan sites. Through the use of cultural, temporal, and geographic attributes, possible cultural influences on Manuelito Plateau may become recognizable.
CHAPTER 3

PALEODEMOGRAPHICS, GENDER IN THE SOUTHWEST,
AND MORTUARY ANALYSIS

Paleodemographics

The increased importance of population as a factor for explaining human biological and cultural development has lead to an interest in the field of paleodemography. Using a descriptive model based on aged and sexed skeletal populations, a sample is put into a life table (Moore et al. 1975). The life table is used to infer local populations’ life processes and aids in the greater understanding of the relationship between populational and cultural processes that anthropologists study.

Past Research

This method of analysis was first applied by Hooton (1920, 1930), but not until Angel’s (1969) study did the field of paleodemographics gain regular use for reconstructing past life patterns. Despite problems in the methods, (Bocquet-Appel and Masset 1982, 1985) the significance of this work has resulted in its repeated application. With each round of criticism, the endeavor has been improved and though it is still problematic, it helps us begin to model paleodemography for the understanding of past populations.
The Good News

The use of life tables and general demographic data in the interpretation of past populations has allowed for comparisons of populations within and between regions and to reconstruct differences and changes in past populations. This method has helped archaeologists interpret sizes, locations, and differential functions of sites and temporal and spatial changes in population concentration. Skeletal remains provide data concerning life expectancy, probability of death within a specific age range, crude mortality rates, and population size and density (Ubelaker 1989). The study of demography has contributed to the greater understanding of the people who actually occupied the archaeological sites. Additional demographic information aids in the interpretation of sites that are otherwise interpreted solely upon cultural materials. The skeletal data along with demography can provide supporting or refuting evidence that archaeologists can use in interpreting a site.

Now the Bad News

Based on prehistoric samples from burial contexts the following general principles and assumptions regarding the use of composite life tables can be recognized (Hoffman 1993):

- The population is assumed to be stable (birth and death rates are fixed over time).
- The population is growing, declining, or staying the same size, but at a constant rate.
- Model life tables from burial populations are based on reasonably large skeletal samples (100 - 300+ individuals) from a large cemetery or pooled from a number of similar sites in a region.
• Model life tables from cemetery samples are based on samples from reasonably long periods of time (several hundreds years).

• Cemetery samples are assumed to represent the average birth and death experience of the population under study, whether from a single site with a large sample or from a pooled multisite sample.

• Over time, various demographic disturbances (wars, epidemics, migrations, etc.) are averaged out so that a cemetery sample is representative of the average birth and death experience of the sample, pooled or not pooled.

There are many problems associated with the reconstruction of past populations. The first challenge is based on the accuracy or ability to accurately age and sex skeletal remains. The results obtained by osteologists are not definite and are estimates that produce ranges of ages and therefore are not tightly controlled or standardized. This in turn leads to data ambiguity and the application to demographic life tables and interpretation should not be the only line of evidence used to draw conclusions. In addition, other influences such as the impact of ecological variation or cultural practices are unknown and this too leads to uncertainty about the representativeness of archaeological data sets (Moore et al. 1975).

Bioarchaeologists are still grappling with the degree to which excavated human remains represent the population from which they were drawn. Archaeological remains represent the portion of the dead population recovered and analyzed. These populations are significantly reduced from the original dead population by the actual number buried at the site, the proportion preserved, and the proportion of individuals recovered (Waldron 1994).
Ubelaker (1981) and Boddington (1987) list further concerns and considerations when dealing with past population studies:

- Post-depositional disturbance - partial destruction of cemetery prior to discovery and excavation.
- Post-depositional decay - Infants in particular may not survive in some soil conditions.
- Incomplete excavation - the limits of the cemetery are often unknown.
- Spatial variability - the excavated sample may be under representative of the cemetery as a whole.
- Differential burial - certain classes of individuals might not be buried in the cemetery, for example, infants are under represented in many cemetery contexts.
- Excavation and post-excavation loss - particularly relevant when dealing with previously excavated and curated samples.

Due to the many assumptions and questions about the representativeness of the excavated and/or curated populations, paleodemographic analysis should be used only to provide a broad outline of the possible dynamics occurring within the population under study.

Example

There are several examples of paleodemographic analyses found in the literature many of which have been applied to the greater Southwest to address questions of the density of past populations and the impact of migration (Longacre 1975). As a useful example of the role of demography for aiding the archaeologist, an example relevant to
this thesis is presented. The study involved a paleodemographic analysis of a small population that was compared to the results of a larger group.

The Duckfoot site located Southwest of Cortez, Colorado has a sample size of 16 burials. Although a small sample, a composite life table was generated and then compared to previously published life tables from the Mesa Verde region, which had 150 individuals from the early time period sample. This data was presented in the Dolores Archaeological Project (DAP) report by Stodder (1986). In the process of this comparison, several errors were found in the original data published by Stodder (1986), and Hoffman (1993) corrected these life tables for future researchers. Because of the small sample size from the Duckfoot site, Hoffman (1993) changed the usual 5 year increment of the life table to 10 year increments up to 50 + years. The results indicated that for all age intervals and time periods, the Duckfoot population life expectancies were higher than the Mesa Verde region life expectancies. There were also a higher number (20%, n=3) of survivors beyond 50 years of age at Duckfoot compared to Mesa Verde (1.33%, n=2). The conclusion made was that the Duckfoot site represents the random deaths of the site inhabitants and the study offered a glimpse into the daily lives of the inhabitants (Hoffman 1993; 296).

The application of the life table in this instance was bold and unusual, but illustrated the potential usefulness of the life table model. A comparative analysis is provided in an usually descriptive avenue (contract reporting), and errors were corrected that went unnoticed for almost 20 years. Through the use of the life table model the inhabitants of the Duckfoot site were comparable to outside groups because a systematic
method was applied. In addition, it was apparent that the inhabitants represented a 'typical' small data set commonly found within the Four Corners Region.

Summary

The application of paleodemographic analysis to populations provides a broad framework for bioarchaeological interpretations concerning past populations. There is also the potential to compare data not normally possible due to small numbers and inconsistent osteological analyses, especially for Southwestern archaeology. Paleodemography helps to address questions that bioarchaeologists and archaeologists have about the inhabitants of the sites they investigate. Though problems exist with the method, if these shortcomings are taken into consideration and if the information is used along with other evidence, paleodemography can help to facilitate interpretations of past populations.

Gender and the Southwest

One way to view social differentiation is through the identification of biological sex and gender. Since all cultures differentiate based on sex and gender (Hays-Gilpin 2001:61), it is remarkable that more investigations have not made this particular focus a priority within archaeological research. It is as if it has been taken for granted that sex and gender are present in past societies, and therefore no further explanation is necessary. Archaeologists would rather focus upon migration, economics, politics, military and leadership roles, even though there is crossover with the examination of gender and sex
relationships with all of these research foci. Looking for differentiated treatment based on
gender and sex will lead to a more detailed and well-rounded interpretation of past
cultures, and should not be taken for granted (Claassen 1992).

Definition

Gender is the cultural value inscribed on sex (Hays-Gilpin 2001:62). Sex is
biologically based and gender is a cultural construct that is variable and not always
dependant upon the biology of a person. Many times archaeologists and bioarchaeologists
interchange the use of these terms when discussing the demography of a population.
Walker and Cook (1998) cleared up this misconception with a well written explanation of
why it is important to differentiate between the words ‘gender’ vs. ‘sex’ within
bioarchaeological research. The distinction between gender and sex is especially
important in bioarchaeological research since sex is determined through skeletal studies
and gender roles are obtained through artifact analysis (Walker and Cook 1998: 256).

Past Research

It is obvious that present-day values and expectations of women, men, and
children were projected onto the past by ethnographic researchers. This makes it difficult
to ask what observable sex differences meant in the past. What it means to be a ‘man’ or
a ‘woman’ cannot be assumed especially for unknown past cultures (Strathern 1988), as
social organization includes behavioral relationships at many levels such as between
individuals, households, communities, and societies (Green and Sassaman 1983:15).
Therefore, gender constructs are linked to concepts of self, personhood, and autonomy
(Moore 1988:41). In turn, gender studies facilitate the identification of people and their
role within society (Bolen 1991:401). It is in this manner that gender studies open up a view of the past that has not always been completely acknowledged or recognized.

When archaeological models of gender were derived from our own culture and from the ethnographic and ethnohistoric accounts of Native Americans in the Southwest, we expected to find Pueblo women bound to their houses grinding corn and caring for children. The men were hunting, working in the agricultural fields, conducting ceremonies in the kivas, and trading long distance. This division of labor screams Western influences and ideals and is a biased view of gender differentiations before western contact (Arnold 2002; Gero 1985; Sørensen 2000; Spector 1991). Western male ethnographers documented and recorded male roles in detail and took for granted that female roles were the same as in the dominant culture (Nelson 1997). This biased our view of the past for many decades and the archaeological record is in need of re-examination so that new and, possibly, more accurate, assessments of gender and sex roles can be understood for past populations.

Example

The understanding of cultural construction of gender is facilitated by ethnographic records with an emphasis on ethnoarchaeological research. For example, the Navajo Indians recognize two sexes (male and female) and four genders (male, female, male $nadleeh$, and female $nadleeh$) (Hays-Gilpin 2001: 62). $Nadleeh$ do the work associated with the opposite sex, and they form same-sex but heterogender relationships (Hays-Gilpin 2001:62). There is no skeletal evidence of these categories of gender, but there may be archaeological gender related indicators such as mortuary treatment and associated grave goods of these individuals. Many North American Indian tribes have
individuals that wish to perform the duties and roles of the opposite sex. These individuals are commonly referred to as ‘berdaches’ and are similar to the nadleeh of the Navajo and the ihamana of the Zuni (Roscoe 1991).

European cultures tend to value male oriented behaviors and roles more highly than female activities, but Pueblo people emphasize gender balancing and equality (Roscoe 1991). Culturally prescribed values can be inferred from archaeological evidence that reflect distinct types of different sex categories, much like social stratification can be suggested by material culture and bioarchaeology (Crown and Fish 1996; Hays-Gilpin 2001; Nelson 1997). Gender can be inferred from the archaeological record through mortuary treatment, associated grave goods, art, and ornamentation. To accomplish this there needs to be knowledge about gender constructs within the culture under study. Though ethnographic analogy is not the best source of this data, due to Western bias and influences in the records and by the observers, it is sometimes the only source and can be used with caution acknowledging the associated inherent problems of assuming cultural continuity of cultural practices.

Summary

Feminist archaeologists promote gender research to address the question of not only who does what activity, or performs which role in society, but to ask the question “for whom is it done?” (Nelson 1997:174). It implies a value to the decision maker in society as an individual and therefore representative of a group within that society. For example, older women in Pueblo society were thought to play a part in religion and ceremony as a result of acquired power or status within the group (Hays-Gilpin 2001;
It was believed that women were born with power; the power to give birth. Once these women reached an age where they were likely viewed as wise and healthy (living past 50 years of age), they were able to acquire social power similar to men. This in turn would enable them to participate in ceremonies usually associated with men (Hays-Gilpin 2001; Howell 1995). There is the inference that because menopausal women cannot reproduce they no longer pose a threat to the power and prestige held by men.

Mortuary Analysis

Cross-cultural mortuary studies presuppose that a person's role in life is reflected in the manner in which they are buried. Through grave location, skeletal biology, and the types of artifacts buried with them social complexity and societal changes can be distinguished (Binford 1971; Carr 1995; Sax 1976; Tainter 1978). The interpretations of mortuary practices are best studied in local, regional, chronological, and archaeological contexts (Wise 2003).

Mortuary studies often focus on the identification of the level of complexity of early societies. Early societies were composed of relatively egalitarian bands and tribes, ranked chiefdoms, or class-stratified early states. This approach implied that complexity, and adaptive fitness, were directly associated with social inequality and exploitation (Parker Pearson 1999).

Past Research

The exploration of roles and identity that might be present in the mortuary record facilitated the recognition of the individual as a social personality. As Saxe observed
(1970:4), each individual was involved in relationships with other members of the society and did so by following rules and roles prescribed by the larger social system. Binford (1971) and O'Shea (1984) introduced the concept of mortuary variability in an effort to rethink the usual mortuary practices as product of social norms of behavior.

Using the basic idea set forth originally by Saxe (1970: 119) that the burial of the dead in specific places has a symbolic significance, the concept can be applied to the Manuelito Plateau sample. Differential burial treatment of groups and individuals can be viewed as laying claim to land or resources. This is accomplished through the establishment of designated burial locations, such as in the midden of a habitation site, within room features and pit structure fill, and on pit structure floors. The basis of these groupings may have been due to health, ethnicity, and/or status within the population.

**Health, Diet and Status**

Health, as defined by Mosby's medical and nursing dictionary (1986: 511), is described as "a condition of physical, mental, and social well being and the absence of disease or other abnormal conditions." It is a constantly changing ongoing process responding to environmental challenges. Population changes in health patterns are evident in the skeletal and dental remains, which in turn allow for the interpretation of general health in prehistory.

The concept of adaptation, derived from cultural ecology, has been associated with Binford's statement (1962) that "...material culture is man's extra somatic means of adaptation." One aspect, applied to funerary contexts, is that of identifying a society’s adaptational efficiency through the fitness of its population as evidenced by the level of health as indicated from stress indicators in bone and teeth (Buikstra 1981). Conversely,
it may be argued that stress-related traumas and lesions denote an increased ability to survive illness and stress and are thus evidence for population fitness and effective adaptive strategies; the absence of stress indicators might be a feature of those persons who died without ever recovering from the initial onslaught to the body (Wood et al. 1992; Roberts and Manchester 1995:164).

Nutrition is necessary for normal growth, development and routine tissue maintenance (Garn 1966); therefore diet has a great deal of influence on health. Limited access to nutritional necessities such as calories, protein, vitamins, and minerals results in the body becoming stressed and more susceptible to disease, and this in turn may lead to a disruption of the normal functions and homeostasis of a living organism (Selye 1956: 11-12).

Access to the nutrition necessary to reduce the amount of stress experienced by an individual can be regulated not only by the environmental availability of food, but also by social organization (Powell 1988). Those individuals or groups within a population with access to consistent supplies of food are likely to achieve better health than the rest of the population. They will be expected to live longer, have less evidence of disease in the skeletal and dental remains, and will attain their maximum stature (Powell 1988: 79). Correlating these physical attributes with mortuary practices could help to identify the existence of social stresses during prehistoric times at Manuelito Plateau.

*Ethnicity and Status*

In the analysis of mortuary variability and social organization, archaeologists have explored the different roles and ethnicities that might be represented in funeral symbolism. This resulted in questioning the labels ethnographers have used to describe
tribal behavior. Saxe stated that each individual was 'a coherent social personality who not only engaged in relationships with other social personalities but did so according to rules and structural slots dictated by the larger social system' (Saxe 1970:4). Ethnic groups are self-defining based in cultural differences (Shennan 1989a, 1989b), and depending on how they are defined is subject to the social and cultural context under examination (Keefe 1989: 1). The flexibility of ethnicity is due to many factors including psychological, biological, territorial, economic, and symbolic influences (Jones 1997). Evidence of cultural identity is limited in archaeological research due to incomplete recovery of past cultural remains, but is by no means beyond the possibilities of archaeological interpretation (Jones 1997). The way in which material culture are meaningful may be random across cultures, but it is not unsystematic within a particular sociohistoric context (Jones 1997: 125). Ethnic symbolism can be seen through social domains such as gender or status differentiation (Erikson 1991). Therefore, it is important to obtain an extensive understanding of past cultural contexts from many sources of data to view ethnicity in archaeology.

To identify status within a cultural group Saxe suggests that, in the case of disposal of the dead, decisions by the living about the social identity of the deceased would be symbolized and determined by the relationships, including the rights and duties, between the deceased and the living (Saxe 1970:9). This view suggests that what is archaeologically recovered from human graves represents how the living viewed the dead, not necessarily how the dead viewed themselves. The position the deceased held within society would therefore outweigh the individual view of identity and represent the greater social organization of the cultural group.
Bryan Turner defines status as based on a specific style of life, maintained and expressed through shared living and eating arrangements, privileged access to power, wealth and scarce resources, and the maintenance of intra-group marriage alliances and other customary conventions (Turner 1988). Status can be based upon political, kinship, and gender entitlements. The role of lifestyle such as dress, speech, outlook, bodily dispositions, and economic class such as in relationship to the ownership or control of means of production can be seen as key to understanding status in a society (Bourdieu 1984; Turner 1988). Status thus involves struggle over scarce resources but is not directly equivalent to class since status groups are communal collectives requiring reproduction of a typical lifestyle whereas economic classes do not necessarily participate in self-identifying lifestyles (Parker Pearson 1999).

At the Manuelito Plateau sites ethnicity could be represented in the ubiquitous pottery that is associated with the Ancestral Puebloan culture. Alternatively, it could be seen in the common placement of burials within midden context. On the other hand, pottery that is unique due to design, style, exoticness due to trade relations, or sheer quantity could represent status, as would burial outside of midden areas. When ethnic markers are present in uncommon burial context, this could represent status differentiation. Therefore, burials found within habitation features, with many material items such as pottery, especially with uncommon types, should represent some form of social differentiation.

Measure of Complexity

Tainter’s approach to measuring social complexity included the interpretation of mortuary ritual as a type of communication system in which certain symbols convey
information about the deceased (1975; 1977; 1980; 1981). The measurement of redundancy, which equals the organization through the duplication of highly associated attributes in a particular group, is one approach to determining the level of complexity within a society (Tainter 1975; 1977; 1980; 1981). Since high redundancy is expected in heterogeneous, complex information systems, Tainter inferred that the social correlate of a mortuary system with high redundancy would be a hierarchical and complex society and conversely, low redundancy was indicative of simple, egalitarian societies (Parker Pearson 1999: 75).

Example

Through the work of O’Shea (1984), conclusions could be drawn about certain ethnographic kinship descriptions, including social structure and funerary rites of the Arikara, Pawnee and Omaha tribes of the Great Plains of America (Parker Pearson 1999: 76). O’Shea was particularly interested in developing an explicitly archaeological methodology that took into account the filtering processes which intervene between the amount and type of information observable in a living society and that which is left for archaeological recovery (O’Shea 1984). According to O’Shea, the type of material culture associated with the deceased could determine distinction in status. Perishable materials such as clothing and totemic grave goods represented horizontal status (e.g. membership of clan, moiety, sodality, etc.), and non-perishable artifacts (e.g. ceramics and stone tools) represented vertical status distinctions (e.g. ranking with differential individual access to wealth and status) (1981; 1984).

O’Shea’s methodology was composed of four stages (1981; 1984); first searching for statistical patterning or associations between graves and the associated artifacts,
second statistical sorting of graves according to age, sex, frequency and spatial
distribution, third the classification of each sub-set according to status differences
(vertical, horizontal and a third category, special status differentiation), and fourth
interpreting each group or sub-set and inferring its social significance. When these
methods were applied, they aided in establishing whether or not ascribed hereditary
social status existed as opposed to that which was achieved during life. It has been
suggested that the appearance of occasional child graves containing wealth
corresponding to wealthier adult graves demonstrates the presence of hereditary status
and therefore vertical differentiation.

Summary

Mortuary practices are treated as static reflections of concepts of society and
social structure, when they should be viewed in the capacity in which are molded. These
include the institutions through which social relationships are brought into being,
transformed and terminated through exchange and alliances (Parker Pearson 1982). The
dead do not bury themselves: “...[I]f graves are in any way an index of social status it is
the social status of the funeral organizers as much as the social status of the deceased that
is involved” (Härke 1997, Leach 1979). Funerary rites are cultural practices. This is
evident when grave goods are not just viewed as elements of an identity kit by
relationship to the deceased, or as portraits of the identity of the deceased. The concepts
of honor and sacredness may be far more important than wealth and ownership in
organizing societies values (Parker Pearson 1999).
Grave goods should be interpreted as items related to gift exchanges with the
dead. This may take the form of personal equipment never used but made specifically for
the deceased. Grave goods may also have been interred because there was no appropriate
living successor to inherit such items (Chapman 1983). To understand funerary practices,
archaeologists have to consider that such events are representations of the perceived
reality of social relations and are also open to conflict, negotiation and misrepresentation
(Parker Pearson 1999). The relationship between power and status in funerary rites and
the fact that funerary material culture does not always reveal to the archaeologist a direct
reflection of social status is important to remember in mortuary analyses (Childe 1951).

This is particularly true when examining the prehistoric mortuary practices of
Manuelito Plateau. Though there may appear to be differences in the treatment of the
dead, it is important to consider that the observed characteristics may reflect a variety of
social circumstances. The inclusion of health variables in interpreting prehistoric cultures
is necessary. It is through the use of a variety of data that the analyst can find the most
comprehensive bioarchaeological interpretation possible.
CHAPTER 4

METHODS AND MATERIALS

Methods

The methods used in this study are bioarchaeological and therefore include both archaeological documentation of the mortuary features and human osteological analysis. As stated previously, the archaeological methods were constrained by the 1996 Navajo Nation Policy for the Protection of Jishcha'a': Gravesites, Human Remains, and Funerary Items. The human remains analysis was based upon the Standards established in 1994 by Buikstra and Ubelaker, and the Anasazi Heritage Center NAGPRA inventory forms (Underwood and Thomas 1996).

Archaeology

Five of the six study sites used in this analysis were originally located and recorded in 1978 by the Office of Contract Archaeology (OCA), which is associated with the University of New Mexico in Albuquerque. The sixth site was found later by mine employees and recoded in 1998 by SWCA.

The main focus of the original McKinley Mine project completed by OCA was to mitigate approximately 14,300 acres of land located near Black Hat, New Mexico (Allen and Eck 1982). The area involved direct and indirect site impacts due to proposed coal mining by the Pittsburg and Midway Coal Mining Company. A sample of archaeological
sites were investigated along New Mexico Highway 264 about midway between Ya-Ta-Hey Post, New Mexico and Window Rock, Arizona. Lands within the project area were both privately and publicly owned. Public owned lands were administered by a variety of agencies, including the Bureau of Land Management (BLM) and the Bureau of Indian Affairs (BIA).

Sixty-two Ancestral Puebloan sites were located in the project area, but only 33 were excavated. Twelve sites were selected randomly and an additional 21 sites were examined to provide specific data related to the research design (Allen and Eck 1982:17).

Recording and Excavation

When SWCA was contracted to conduct the NAGPRA clearance in 1997 I was a crewmember and the physical anthropologist. The sites were mapped with a transit, and surface features were recorded (including midden boundaries), site boundaries, and topographical contours of the site. The sites were then surveyed for any human bone exposed on the surface, and for any diagnostic artifacts that would assist in establishing a chronological date for the site. When human remains were found on the surface they were mapped and a one by one meter unit was established around the exposed human bone. This unit was then hand excavated in arbitrary 10 cm levels to establish the extent of the human remains.

The excavation unit provided a framework from which to look for articulated human remains. If no articulation of bone elements were found, the unit designation provided associated artifacts for the isolated bone. Any artifacts encountered during the excavation of the unit were analyzed as associated funerary objects per the Navajo Nation Jishchaa (1996) policy. When articulated bones were encountered, the one by one meter

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unit was abandoned and the human remains were excavated as a feature. The surrounding fill was screened using 1/8-inch mesh to recover associated artifacts and human bone.

Once the surface bone was investigated, the midden areas of the sites were systematically trenched using a smooth edged backhoe bucket. Monitoring of the mechanical excavation was conducted by the physical anthropologist (myself) or, if the physical anthropologist was unavailable, the archaeological crew chief. Identification of human remains and architectural features was the priority. When human remains were identified, mechanical excavation was discontinued in the immediate area, the bone flagged for hand excavation, and the associated back dirt screened to recover any associated bone or artifacts. After completion of the midden trenching, the midden area was systematically stripped of cultural matrix. To accomplish this, the backhoe bucket was used to remove thin layers of soil on the horizontal surface in blocks designated by the reach of the backhoe arm. This technique allowed for the location of any human remains missed by the trenching process. Again, when human remains were encountered the mechanical excavation was discontinued, the area flagged and hand excavated, and the associated back dirt screened for artifacts and human bone.

After the burials were removed from the midden, the area was completely mechanically stripped down to sterile soil to ensure that all cultural material had been investigated. The architectural features of the site were also excavated using the backhoe. First, they were trenched, then excavated with the backhoe, and then systematically stripped down to sterile soils. The features were documented as to size and
depth and fill descriptions. No detailed excavation or analysis was allowed for these features, since these sites had already passed Section 106 clearances during the OCA project (West et al. 1998).

Archaeologists conducted the detailed hand excavation of the human burials under the supervision of the physical anthropologist. Excavation tools including trowel, metric tape, line level, wooden tools, spoon, and brush were used to uncover the remains during analysis and removal.

**Reburial**

As per the Navajo Nation Policy, all of the human remains were reburied on McKinley Mine lease land on the same day that they were removed from their original graves. The reburial pits were located at predesignated limited access areas of already mined and rehabilitated land. Burials from one site were placed in a large 8-foot deep hole and the skeletal remains were positioned as they were found. This included orientation, articulation, and flexure of the skeletal elements. Associated grave goods were also placed in their original relationship with the burial, as was a bag of soil from the grave feature. More soil was placed over the remains and artifacts to protect them while the rest of the site was investigated. When excavation of the site was complete and all of the human remains recovered and reburied, the large burial pit was filled in using a backhoe and metal plaques engraved with the site number and burial number, were placed on the surface over the graves.

**Documentation**

Documentation included feature descriptions and provenience information, detailed mapping, soil descriptions, and artifact descriptions. The burials were described
as to their location within the site (context), burial type, body positioning, head and body orientation, and the artifacts were mapped as to their location in association with the burial. The archaeological excavation forms were provided by SWCA, Inc. and represent the basic information required for burial recovery. This information was originally used to produce a limited distribution archaeological report to the land agencies, McKinley Mine, and the Navajo Nation. The original cultural resource management report was only descriptive in nature and contained no analysis of the data recovered. The original forms were turned over to the Navajo Nation Archaeological Division (NNAD) for permanent housing, but for this thesis, I had access to the original excavation forms and individual site reports.

Thesis Analysis

For this research, the archaeological data were analyzed to determine the mortuary practices for the Manuelito Plateau sample. Tables of burial type, body positioning, body orientation, context and associated artifacts for each site were generated to determine the patterning within and between the sites. These categories were then compared to regional Ancient Puebloan areas including the Kayenta at Black Mesa, Mesa Verde, Puerco River Valley, and Chaco Canyon. This regional examination was limited to sites within the Pueblo II-III (AD 900-1300) period.

All statistical analysis was carried out using Excel 1997 for Windows, SPSS, and Minitab Student 12, including descriptive statistics such as ratio and percentage data. These statistics assisted in the interpretation of basic patterns that were then further tested.
with chi-square (Goodness of Fit) formulae or Fishers Exact Test for significance using a 5% level of significance. T-tests were employed when applicable to the data. Further visualization of the data included line drawings and histograms.

**Human Osteological Data**

The skeletal and dental data were recorded on osteological analysis forms generated especially for this project and modeled after the Anasazi Heritage Centers NAGPRA Inventory forms (Underwood and Thomas 1996), and the *Standards* methods (Buikstra and Ubelaker 1994). These forms were made to facilitate analysis time in adverse weather and environmental conditions encountered during field analysis, and to encourage consistent data collection.

The original field osteological analysis which consisted of visually inspecting the remains to produce an inventory of the skeletal elements and dental portions present, to establish sex, age, and stature, to observe gross pathologies, and to make restricted metric, nonmetric and dental observations were used in this thesis project. The equipment used on site to obtain the osteological data included sliding and spreading calipers for metric observations, an osteometric board, and a cloth metric tape.

For this thesis, the osteological data were analyzed to determine the site demographics and general health patterns for the Manuelito Plateau sample. Tables of age, sex, stature, porotic hyperostosis, dental caries, and mortuary treatment by site were generated to determine any patterning within and between the sites. These categories
were also compared to regional Ancient Puebloan areas such as the Kayenta at Black Mesa, Mesa Verde, Puerco River Valley, and Chaco canyon. The regional examination was limited to sites within the Pueblo II-III (AD 900-1300) period.

As with the archaeological data, Microsoft Excel 1997 for Windows, SPSS, and Minitab Student 12 computer programs were used to generate ratio and percentage data for each category examined. These statistics produced basic patterns that were then further tested with chi-square (Goodness of Fit) and Fisher Exact Test formulae for significance using a 5% level of significance of the observed patterns. T-tests were employed when applicable to the data. Histograms and charts assisted in the visualization of any patterns present.

**Paleodemography**

To be able to identify unusual patterns within the skeletal sample, the morbidity and mortality of the population needed to be established. This would assist in determining whether or not the Manuelito Plateau community was representative of an Ancestral Puebloan population.

The demographic identity of a population from archaeological contexts is based on skeletal data including numbers of individuals, sex, and age estimates. This demographic analysis was used to predict the structure of the living population (Hoppa 2002). The most common way to express this information is by using the descriptive life table model (Moore et al. 1975). The use of life tables and general demographic data in the interpretation of past populations has lead to the ability to compare populations within and between regions and to reconstruct differences and changes in past populations. Archaeologically, this method has been applied to the interpretation of site size, locations
and functions, as well as the change in population concentrations temporally and spatially. The data derived from skeletal remains contributes to the greater understanding of life expectancy, probability of death within a specific age range, crude mortality rates and population size and density (Ubelaker 1989).

Using the assigned age ranges; fetal (< birth), infant (birth to 2.9 years), child (3 to 11.9 years), adolescent (12 to 19.9 years), young adult (20 to 34.9 years), middle adult (35 to 49.9 years), and older adult (50.1 + years), life tables were generated and include mortuary, survivorship, and life expectancy curves. The results of this analysis were compared to Mesa Verde (Stodder 1984), the Black Mesa Project (Martin et al. 1991) representing the Kayenta populations, and the El Paso Natural Gas (EPNG) project representing the population from the southern San Juan Basin near Tohatchi, New Mexico (Flores and Kearns 1996), which was considered related to Chaco Canyon. There were no known life tables generated from the Puerco River Valley region. To generate this data required searching for undistributed grey literature and was beyond the scope of this project. Therefore, the relatedness of the Manuelito Plateau sample to the Puerco region cannot be determined at this time.

*MNI.* The first step in paleodemographic analysis is to determine the minimum number of individuals (MNI) for skeletal elements found in mixed or displaced proveniences. These elements were examined for age, sex, and pathological expressions, which in turn aided in the identification of individuals. The estimate of the minimum number of individuals was based on the presence of repeating bone elements, portions of bone elements, as well as age and sex differentiation (White and Folkens 1991). When multiple repeating elements or elements with differing age or sex estimates or, in certain
situations, when like pathological expression were encountered, these elements were grouped. When possible the original provenience was established, and if the bone was compatible, it was placed with the appropriate individual. When no specific provenience or burial association could be established, a new burial number was assigned, indicating another individual from the site.

**Sex.** The estimation of the sex of the adult individuals was based on a combination of cranial and pelvic morphological observations as well as postcranial measurements defined in Bass (1987; Buikstra and Ubelaker (1994) and Ubelaker (1989). If sexually dimorphic traits were not present or unobservable, an assignment of indeterminate was made. Since the determination of the sex of an individual was based upon characteristics that developed during puberty, the estimation of sex for immature individuals was not attempted (Bass 1987).

Of the 26 traits examined, the pelvis was given greater leverage in the estimate of sex than the cranium. Postcranial measurements and gross observations were used to further support or question the estimate made from the pelvis. If the pelvis was not present, the estimate of sex was deemed less confident.

A standardized form based on Buikstra and Ubelaker’s (1994) *Standards* method was generated for this analysis. It was used to score the sex based traits of the skeleton for each adult individual. Five pelvic and five cranial traits from the *Standards* were listed along with 16 additional postcranial, cranial, and pelvic traits. These additional traits were scored using the same numerical designation method applied to the *Standards* estimate method. Most of the traits had a scoring system from one to three; one was female, two was indeterminate, and three was male. However, some of the traits were
scored from zero to five; zero was indeterminate, one was female, two was probable female, three was ambiguous sex, four was probable male and five was male. Indeterminate means that this trait could not be observed, ambiguous sex means that a trait was observed, but that no clear expression of male or female could be observed. This standardized scoring technique provided better data for future comparative research.

**Age.** Multiple methods were used to estimate the age as accurately as possible. Adult age was based upon cranial suture closure (Ubleaker 1989), dental attrition (White and Folkens 1991), sternal rib morphology (Iscan et al. 1984), vertebral osteoarthritic development (Ubelaker 1989), auricular surface morphology (Lovejoy et al. 1985), pubic symphysis morphology and component sum as presented in Steele and Bramblet (1988). Epiphyseal development, measurements of immature diaphyses (Bass 1987; Kosa 1989), and dental development (Ubelaker 1989) were used for subadult age estimates.

As with the estimate of sex, a standard form was generated for this analysis and filled out for each individual stating the observation, the estimated age range for each trait, and the reference for each trait. Only general dental observations were included with more detailed information presented on the dental forms generated for the individual analysis.

Age categories were assigned based on the Standards method (Buikstra and Ubelaker 1994). For clarity and comparative purposes, a finer delimitation between the ages was assigned for this study. This aided in the comparison with past research as well as in paleodemographic analyses.

- Fetal (< birth)
- Infant (birth to 2.9 years)
Child (3 to 11.9 years)
Adolescent (12 to 19.9 years)
Young Adult (20 to 34.9 years)
Middle Adult (35 to 49.9 years)
Older Adult (50.1 + years)

*Stature.* The estimate of adult stature may be considered an indicator of collective stress throughout childhood, and has been used in evaluating the overall health of modern living human populations (Falkner and Tanner 1986). Though stature was genetically determined, it has been established that nutrition directly affects the progression of stature development, and thus was considered a good indicator of general health patterns within populations. This in turn has been used to suggest differential treatment within a population such as access to certain nutritional foods (Powell 1988).

Stature estimates for both males and females were based on the formula derived from Genoves (1967) for Mesoamericans and corrected by Bass (1987). This formula has been frequently used in the analysis of Ancestral Puebloan populations (Hoffman 1993; Stodder 1986).

When possible the adult femur length measurement was used to estimate the stature of an individual. If the femur was not present or incomplete, the tibia or another complete long bone was used to determine the stature estimate.

Pathological Data

Gross skeletal pathologies were observed and described in a narrative manner. In the case of porotic hyperostosis, this condition was graded according to expression.
Porotic Hyperostosis

Porotic Hyperostosis a descriptive term for cranial vault and orbital bone lesions is thought to be the result of marrow hyperplasia due to anemia (El-Najjar et al. 1976), though other causes of the bony response are also possible, including parasitic infection and genetic disorders (Ortner and Putschar 1985; Stuart-Macadam 1992). These lesions appear as the diploe of the bone widens and begins to thin resulting in small apertures appearing on the surface of the bone. Marrow hyperplasia is commonly associated with human populations with iron deficiency anemia. Certain groups of people are more likely to develop iron deficiencies, such as infants, young children, women of childbearing age, and individuals suffering from chronic bleeding associated with intestinal parasites or cancer. This deficiency can become severe enough that the bones of the cranium and, in rare instances, the postcranial skeleton become affected.

The methods of determining the presence of porotic hyperostosis vary from radiograph, chemical, microscopic, and macroscopic observations. Macroscopic observation of porotic hyperostosis, though highly variable, involves simple presence/absence data, degrees of remodeling (Mensforth et al. 1978; Walker 1985; Walker 1986), and nominal applications to degrees of expression (Buikstra and Ubelaker 1994; Hart 1998; Ryan 1977), location of lesions, severity of lesions, and the portion of bone involved in the pathology process (Buikstra and Ubelaker 1994; Hart 1998).

To facilitate future analyses and allow for future comparisons the data in this study was split into three categories. The variables of healed, healed and active, and...
active were used to aid in the analysis. Differential diagnoses were made using references such as Merbs (1983, 1989); Ortner and Putschar (1985); and Resnick and Niwayama (1981).

The terms used in this analysis consist of porotic hyperostosis for bony porosity of the external or outer cranial vault bones, cribra orbitalia for the orbital lesions and, cribra cranii for interior cranial vault porosity. The presence of this pathology was examined in categories of age, sex, and mortuary treatment to determine if those with the disease expression were treated differently in death and therefore in life in terms of overall health and possible differential access to nutritional resources. Frequencies of the different expressions as well as presence and absence were generated to address this question.

Dental Pathologies

An examination of the dental pathologies including caries and abscesses was undertaken. These pathologies were considered to be indicators of diet and health, and provide comparative data from within the population and within the region. Frequencies of the dental pathologies were calculated as a percentage of the total number of teeth examined with regards to age, sex, site, and mortuary treatment.

Dental Caries. Considered an infectious and transmissible disease initiated by microbial activity on the tooth surface, dental caries resulted in the progressive destruction of the tooth structure (Pindborg 1970:256). Destruction of the dental tissue developed from lytic activity because of bacteria. Lytic activity has been defined in the pathological literature as the loss of dental or bone tissue (Ortner and Putschar 1985). Bacterial organisms involved in the destruction of dental tissue include lactobacilli and
streptococci, although the basis by which organisms produce caries is still unclear (Darling 1970:273). Dental cavities most likely develop because of bacterial activity, and are facilitated by the tooth structure morphology such as pits and grooves.

Cavities were scored using the method established by Turner et al. (1991). Details concerning the size and location on the tooth were scored and recorded.

Abscess. Since dental caries could have resulted in the destruction of the entire crown and in some instances the tooth root, in turn subsequent dental related alveolar bone abscessing could develop. Exposure of the pulp chamber from dental caries or severe attrition could result in an increased risk of infection with associated alveolar periapical bone abscessing (Ortner and Putschar 1985). This in turn may result in the destruction of the supporting dental tissue manifesting into an abscess. Periapical abscesses are recognizable when the spreading infection destroys the external bony surface of the alveolar bone usually associated with a tooth (Lukacs 1992). When this type of infection developed it could have been severe enough to result in blood poisoning and even death (Hillson 1996).

Abscesses were scored based on the size of the lesion as well as if it was healed, healing or actively remodeling at the time of death. The location and associated tooth was also part of the analysis of this pathology.

The dental analysis was conducted using Turner et al.'s (1991) methodology. This method included a scoring technique for recording dental attrition, pathologies, and morphological characteristics and provided comparability with other projects within the Southwest and beyond.
Due to constraints set forth in the Navajo Nation policy hypoplastic lines were not measured, nor were any general metric observation of the dental morphology completed. When applicable, written narratives were made of unusual or abnormal tooth formations or alterations.

Materials

The skeletal remains of 99 individuals from six prehistoric Ancestral Puebloan sites were examined for this study (Table 1.4). The sites date from the Pueblo II to Pueblo III periods roughly A.D. 900 to 1150. The basis for the determination of the site chronology was ceramic assemblages, one radiocarbon date, and one dendrochronology date. These excavations resulted in the nearly complete recovery of all human remains from the sites as part of the NAGPRA clearance project. As per the NAGPRA recovery project guidelines, all of the human remains and the associated artifacts were reburied directly after the in-field osteological analysis. The sites were destroyed as part of the coal mining operations shortly after the project ended in 1997 and 1998

Sample Size

From the six sites, 99 individuals were recovered, including 48 primary burials, 5 secondary burials, and 46 burials from unknown, mostly disturbed, contexts (Table 1). Of the identified human remains, 21 were female, 22 were male, 47 were immature individuals that could not be sexed and nine were adults of indeterminate biological sex (Table 4.2).

This sample was large when compared to those recovered from other prehistoric Puebloan sites in the Southwest (Cordell 1982, Judge 1979, Roberts 1939, Vivian and Mathews 1964). One example, the Dolores Archaeological Program recovered 66 burials
from 52 excavated sites (Stodder 1986). Excavation methods, research goals, differential preservation, soil, and burial treatment may explain the greater number of individuals recovered from the NAGPRA clearance project.

*Preservation*

The human remains varied in condition from site to site. Depending on burial depth and feature association, the remains ranged from fragmentary and weathered surface bone to excellently preserved deeply buried remains. This pattern was also observed at the Black Mesa excavations (Jacobi 1986).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Period</th>
<th>Date</th>
<th>Basis of Date</th>
<th>Total No. of Individuals</th>
<th>Discrete Burials</th>
<th>Isolated Bone</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA31240</td>
<td>Pueblo II - Pueblo III</td>
<td>A.D. 900 - 1300</td>
<td>Ceramics</td>
<td>20</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>LA31247</td>
<td>Pueblo II - Pueblo III</td>
<td>A.D. 950 - 1250</td>
<td>Ceramics</td>
<td>37</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>LA31249</td>
<td>Pueblo II - Pueblo III</td>
<td>A.D. 925 - 1200</td>
<td>Ceramics</td>
<td>8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>LA31277</td>
<td>Pueblo II - Pueblo III</td>
<td>A.D. 866-1150</td>
<td>Ceramics and Dendro-chronology</td>
<td>18</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>LA31284</td>
<td>Pueblo II - Pueblo III</td>
<td>A.D. 925 - 1220</td>
<td>Ceramics</td>
<td>14</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>LA121585</td>
<td>Late Pueblo II</td>
<td>A.D. 1000 - 1150</td>
<td>Ceramics and Radiocarbon date</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Weathering was most common on bone found on the surface and associated with deflated midden context. Exposure and cattle grazing and trampling contributed to the fragmented conditions. The portions of bone exposed to the surface were friable,
bleached white in color, with cracked cortical bone. The buried bone was in much more stable and complete condition.

Table 4.2. Burial Sample.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>No. of Burials</th>
<th>Males</th>
<th>Females</th>
<th>Immature</th>
<th>Indet. Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA31240</td>
<td>20</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>LA31247</td>
<td>37</td>
<td>9</td>
<td>5</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>LA31249</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>LA31277</td>
<td>18</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>LA31284</td>
<td>14</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>LA121585</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>99</td>
<td>22</td>
<td>21</td>
<td>47</td>
<td>9</td>
</tr>
</tbody>
</table>

Indet. = Indeterminate sex.

The deeply interred burials, usually associated with house features, had excellent bone integrity with most of the fragmentation associated with the ends of long bones. The bone elements that were in contact with the floor of features, where water accumulation occurred, were also friable and fragmentary. Preservation was so much better in these deeply buried features that one individual from LA 121585 even had the remains of cedar branches preserved under the skeletal remains. Interestingly, the bone from this individual was eroded and fragile where it was in contact with the well preserved, yet fragile, cedar branches.
Associated Grave Goods

Not all of the burials had directly associated grave goods; in fact, most did not have any burial goods. Due to the Native American burial guidelines that were followed for this project; any artifact found within a two by two-meter square unit was considered an associated artifact. Excavation units were only used when human bone was identified on the ground surface. In some instances, there were a few human remains located within the excavation unit, but many ceramic sherds and flaked stone artifacts were recovered because of the location of bone within midden context. As discussed above, in accordance with the Navajo Nation policy all artifacts and animal bone were collected, analyzed in the field, and reburied with the human bone. To the Navajo nation these items were considered associated grave goods.

For the purposes of this thesis, however, only those objects found directly in association with an articulated burial were treated as associated grave goods. Because many of the human remains were buried within cultural fill, it is likely that many of the artifacts found in the excavation units that surrounded the burials did not represent goods intentionally interred with the individual. Accordingly, those artifacts were not included in this analysis.

Directly associated grave goods consisted of ceramic vessels, lithic tools, and modified animal bone. In a few instances, crystal and turquoise were recovered
Table 4.3. Chronology of the Southwest.

<table>
<thead>
<tr>
<th>Date</th>
<th>Mesa Verde</th>
<th>Chaco Canyon</th>
<th>Cibola/Puerco River Valley</th>
<th>Kayenta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>Not Occupied</td>
<td>Not Occupied</td>
<td>Zuni (AD 1325-Present)</td>
<td>Hopi (AD 1300 to Present)</td>
</tr>
<tr>
<td>1325</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1250</td>
<td>Pueblo III (AD 1100-1300)</td>
<td>Mesa Verde (AD 1220-1300)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1175</td>
<td></td>
<td>Late Bonito (AD 1120-1220)</td>
<td>Houck Phase (AD 1075-1250)</td>
<td></td>
</tr>
<tr>
<td>1150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1075</td>
<td></td>
<td></td>
<td>Classic Bonito (Pueblo II) (AD 1020-1120)</td>
<td></td>
</tr>
<tr>
<td>1050</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1025</td>
<td></td>
<td></td>
<td>Wingate Phase (AD 975-1075)</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>Pueblo II (AD 900-1100)</td>
<td></td>
<td>Holbrook Phase (AD 1075-1100)</td>
<td></td>
</tr>
<tr>
<td>975</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>950</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>875</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>850</td>
<td>Pueblo I (AD 750-900)</td>
<td>Pueblo I (AD 750 - 920)</td>
<td>Pueblo I (AD 750-900)</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>750</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>Baskemaker III (AD 575-750)</td>
<td>Baskemaker III (AD 400 - 750)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>650</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>575</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a Adapted from Cordell 1997

*b Adapted from Irwin 1997
suggesting important individuals within the community. Large pieces of ceramics and sandstone slabs that either lined or covered the body were also found.

**Chronology**

All six sites were contemporary and fell within the Pecos classification of early Pueblo II to late Pueblo III (AD 900 to 1250) periods (Table 4.1). Table 4.3 presents the regional chronology. To assist in placing Manuelito Plateau within a temporal framework, the surrounding regions of Mesa Verde, Chaco Canyon, Cibola/Puerco River Valley, and Kayenta were used as comparatives in this project.

All of the sites were dated according to ceramic seriation. Special permission was granted in two instances to use other means of dating. Site LA31277 was not previously tested or excavated. Since one of the priorities of the project was to determine the chronology of the sites investigated, a dendrochronology sample was taken from this site, and sent for analysis. The sample came from a masonry structure with an unplastered floor. The dendrochronology sample was sent to the University of Arizona in Tucson, and yielded a noncutting date of A.D. 866; thus, the tree was cut some time after A.D. 866. The older date for this sample may be an example of scavenged wood, reused at this site from an earlier site (Fox et al. 1997a).

Site LA121585 was dated using ceramic analysis and radiocarbon dating. The sample originated from an extramural hearth and was sent to Beta Analytic, Inc. for analysis. The calibrated results were (2-sigma, 95% probability) AD 785-1005 (±50 years), which placed the site during the late Pueblo I to the early Pueblo II period (West and Neal 1999; 9.4). Since this date was surprisingly early considering the ceramic date of Late Pueblo II (AD 1071), it was assumed that this radiocarbon date represented the
last use of that particular feature. This fits well with the fact that the stone slabs that surrounded the hearth were collapsed across the top, and this prevented the accumulation of random charcoal (West and Neal 1999: 9.4).
CHAPTER 5

RESULTS

Demographics

From the six archaeological sites investigated, 99 individuals were identified for this research project. Appendix II summarizes the Manuelito Plateau sample by individual. There were 52 adults and 47 subadults identified; of the adults, 22 were male (42.3%), 21 female (40.4%), and there were nine adults that could not be estimated for biological sex due to missing diagnostic markers (17.3%). The distribution of males and females between the six sites show that there were more males than females from three of the sites and more females than males from the other three sites (Figure 5.1).

The adults were divided into four age categories, adolescent (12 to 19.9 years; n=4), young adult (20 to 34.5 years; n=25), middle adult (35 to 49.9 years; n=15), and older adult (50 + years; n=8) (Table 5.1). The subadults were divided into three age groups, fetal (pre-birth; n=3), infant (birth to 2.9 years; n=29), and child (3 to 11.9 years; n=15) (Figure 5.2 and Figure 5.3). The average of the age range for each individual was calculated and used for comparative purposes. The mean age at death for the whole sample was 19.4 years $\bar{Y} = \frac{\sum Y}{n} \ (\bar{Y} = 1924.2/99 = 19.4)$. This low number was
Figure 5.1. Male and Female Counts by Site Number.

### Table 5.1. Percentage of the Manuelito Plateau Sample by Site.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Fetal</th>
<th>Infant</th>
<th>Child</th>
<th>Adolescent</th>
<th>Young Adult</th>
<th>Middle Adult</th>
<th>Older Adult</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA31240</td>
<td>0%</td>
<td>20%</td>
<td>25%</td>
<td>0%</td>
<td>30%</td>
<td>20%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(n=4)</td>
<td>(n=5)</td>
<td>(n=6)</td>
<td>( n=6)</td>
<td>(n=4)</td>
<td>(n=1)</td>
<td>(n=20)</td>
<td></td>
</tr>
<tr>
<td>LA31247</td>
<td>5.4%</td>
<td>40.5%</td>
<td>5.4%</td>
<td>10.8%</td>
<td>21.6%</td>
<td>8.1%</td>
<td>8.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(n=2)</td>
<td>(n=15)</td>
<td>(n=2)</td>
<td>(n=4)</td>
<td>(n=8)</td>
<td>(n=3)</td>
<td>(n=3)</td>
<td>(n=37)</td>
</tr>
<tr>
<td>LA31249</td>
<td>0%</td>
<td>12.5%</td>
<td>12.5%</td>
<td>0%</td>
<td>25%</td>
<td>50%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=4)</td>
<td>(n=8)</td>
<td>(n=8)</td>
</tr>
<tr>
<td>LA31277</td>
<td>0%</td>
<td>22.2%</td>
<td>16.7%</td>
<td>0%</td>
<td>38.9%</td>
<td>11.1%</td>
<td>11.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(n=4)</td>
<td>(n=3)</td>
<td>(n=3)</td>
<td>(n=7)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=18)</td>
</tr>
<tr>
<td>LA31284</td>
<td>7.1%</td>
<td>35.7%</td>
<td>21.4%</td>
<td>0%</td>
<td>14.3%</td>
<td>14.3%</td>
<td>7.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(n=1)</td>
<td>(n=5)</td>
<td>(n=3)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=1)</td>
<td>(n=14)</td>
</tr>
<tr>
<td>LA121585</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=1)</td>
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<td>(n=2)</td>
</tr>
<tr>
<td>Totals</td>
<td>3%</td>
<td>29.3%</td>
<td>15.2%</td>
<td>4%</td>
<td>25.2%</td>
<td>15.2%</td>
<td>8.1%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(n=3)</td>
<td>(n=29)</td>
<td>(n=15)</td>
<td>(n=4)</td>
<td>(n=25)</td>
<td>(n=15)</td>
<td>(n=8)</td>
<td>(n=99)</td>
</tr>
</tbody>
</table>
Figure 5.2. Manuelito Plateau Age Distribution.

Figure 5.3. Manuelito Plateau Age Counts by Site.
influenced greatly by the large number of infants represented in the recovered sample. The mean age at death for males was 38.5 years ($Y = \frac{847}{22} = 38.5$) and for females 33.8 years ($Y = \frac{708.7}{21} = 33.8$).

Demographic Regional Comparisons

Figure 5.4 illustrates the age distribution of the Manuelito sample percentages. When the research sample was compared to the combined regional samples of Tohatchi Flats, Black Mesa NAGPRA recovery, Black Mesa original investigation, Chaco small sites, and the Mesa Verde sample (Figure 5.5), similar patterning was evident. There was an increase in death rates during infancy and among young adults and a decrease in the percentages of death during adolescence. These patterns were similar to those found among the Ancestral Puebloan populations within this region. The death rate patterns for the Manuelito Plateau sample were equivalent to the surrounding population samples during this cultural period.

When age range categories were compared for each region (Table 5.2 and Figure 5.5) a similar pattern to the regional comparison was evident. Manuelito Plateau and the Black Mesa sample recovered during the same NAGPRA project share the most similar patterning with large numbers of infants, followed by young adults, and middle adults. Though comparisons between sites were hindered somewhat by differing methods used for aging and different definitions for age categories, they still demonstrate relatively similar patterning. Chaco and Mesa Verde were more comparable to each other, and differed from patterns at Black Mesa, Tohatchi Flats, and Manuelito Plateau. These differences were further explored using chi-square analysis.
Figure 5.4. Manuelito Plateau vs. Regional Age Distributions.

Figure 5.5. Age Distribution between Regional Groups.
To compare Manuelito Plateau with the surrounding population samples fetal and infant, and middle and older adults’ age categories were combined to compensate for low cell values. When comparisons between the Manuelito Plateau sites and the surrounding regional populations were made using chi-square analysis, significant differences were found between Manuelito Plateau and Mesa Verde \((X^2 = 28.0347, \text{ df} = 4, p \leq 0.001)\), and Manuelito Plateau and Chaco Canyon \((X^2 = 11.5260, \text{ df} = 4, p \leq 0.025)\). Further lumping of the age categories into three groups of infant and child, adolescent and young adult,

Table 5.2. Comparative Pueblo Age Classifications.

<table>
<thead>
<tr>
<th>Samples</th>
<th>Fetal</th>
<th>Infant</th>
<th>Children</th>
<th>Adolescence</th>
<th>Young Adult</th>
<th>Middle Adult</th>
<th>Older Adult</th>
<th>Total</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manuelito Plateau</td>
<td>3%</td>
<td>29.3%</td>
<td>15.2%</td>
<td>4%</td>
<td>25.3%</td>
<td>15.2%</td>
<td>8.1%</td>
<td>99</td>
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<tr>
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<tr>
<td>Tohatchi Flats</td>
<td>2.1%</td>
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<td>17%</td>
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<td>Black Mesa</td>
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<td>34.4%</td>
<td>9.4%</td>
<td>6.3%</td>
<td>21.9%</td>
<td>18.8%</td>
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<td>Black Mesa²</td>
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<td>12.7%</td>
<td>15.9%</td>
<td>13.4%</td>
<td>19.8%</td>
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<td>21%</td>
<td>26.7%</td>
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<td>Mesa Verde</td>
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<td>14%</td>
<td>18.3%</td>
<td>19.2%</td>
<td>31%</td>
<td>16.2%</td>
<td>9%</td>
<td>328</td>
<td>42.7%</td>
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<td>(n=60)</td>
<td>(n=63)</td>
<td>(n=63)</td>
<td>(n=103)</td>
<td>(n=53)</td>
<td>(n=3)</td>
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<tr>
<td>Totals</td>
<td>0.8%</td>
<td>20.2%</td>
<td>17.4%</td>
<td>15.4%</td>
<td>25.7%</td>
<td>16.1%</td>
<td>6.3%</td>
<td>768</td>
<td>100%</td>
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<td>(n=6)</td>
<td>(n=15)</td>
<td>(n=134)</td>
<td>(n=104)</td>
<td>(n=197)</td>
<td>(n=124)</td>
<td>(n=48)</td>
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<td></td>
</tr>
</tbody>
</table>

1 Pueblo only sites (Flores 1996:169)
2 Age categories were not modified for this table (Spur 1993:176)
3 Pueblo only sites (Martin et al. 1991:34-37)
4 Age categories were modified for this table (Akins 1986:20)
5 Early and late sites combined (Stodder 1984:28 and 29)
and mid and old adult again produced a difference between Manuelito Plateau and Mesa Verde ($X^2 = 14.606, df = 2, p \leq 0.001$). When just the categories of subadults vs. adults were compared between Manuelito Plateau and the surrounding samples, Mesa Verde was the only region found to be significantly different from the Manuelito Plateau sample ($X^2 = 7.5990, df = 1, p \leq 0.01$). The age distribution patterns suggest that Manuelito Plateau was more similar to the groups associated with Black Mesa and Tohatchi Flats than Chaco or Mesa Verde.

*Life Tables*

To further explore the mortality data from the Manuelito Plateau life tables were generated (Table 5.3). The life tables were generated using Ubelaker’s (1989:139-140) explanation. An age interval (x) of five years was used to adjust for most of the error in estimating age at death (Ubelaker 1989:139). $D_x$ represents the number of deaths from the sample that fall into the age categories. The percentage of deaths ($d_x$) is the $D_x$ number expressed as a percentage of the total number of individuals in the sample (Ubelaker 1989:139). The survivorship curve is the percentage of the original population that is still alive at the beginning of the interval (Ubelaker 1989:139). This is calculated by subtracting the percentage of death ($d_x$) during the preceding interval from the percentage of survivors ($l_x$) in the same interval (Ubelaker 1989:139). This column always begins with the number 100. The probability of death ($q_x$) is calculated by dividing the percentage of deaths ($d_x$) during the interval by the number of survivors entering that interval ($l_x$) (Ubelaker 1989:139).
The Lx result represents the total number of years lived by all individuals during each interval. This is calculated by the formula \( L_x = \frac{5(l_x + l_{o})}{2} \) where \( l_x \) is the number of survivors entering the interval \( x \) and \( l_{o} \) is the number of survivors entering the following interval (Ubelaker 1989:139-140). Column \( T_x \) indicates the total number of years remaining in the lifetimes of all of the individuals entering each age interval (Ubelaker 1989:140). To calculate \( T_x \), add the values in the \( L_x \) column for that interval and all succeeding intervals (Ubelaker 1989:140). The last column of the life table (\( e^o x \)), represents the average number of years an individual can expect to live, this is also known as the age categories life expectancy (Ubelaker 1989:140). The formula \( e^o = T_x/l_x \) is used to determine the life expectancy (Ubelaker 1989:140). Figure 5.6 illustrates the percentage of deaths (\( d_x \)), figure 5.7 represents the survivorship curve, or \( l_x \) column of the life table, and figure 5.8 plots the life expectancy of the Manuelito Plateau sample.

The life table shows that if an individual from the Manuelito Plateau survived birth they would likely live to the age of 25.38 years. If an individual survived to 4.9 years, they would likely live 21.35 more years. The life expectancy declines to the point where if an individual lived to 54.9 years then they would only expect to live 2.5 years more. Figure 5.6 illustrates that the Manuelito Plateau sample had a large percent of deaths between the ages of 1 and 4.9 years with another high incidence of death during the years of 30 to 34.9.

The survivorship curve for the Manuelito Plateau sample shows the percentage of the approximate population of 100 persons still living at the end of each five-year age interval (Figure 5.7). The curve exhibits a sharp decline after the age group of 1 to 4.9 years.
Table 5.3. Manuelito Plateau Life Table 5 year Age Intervals.

<table>
<thead>
<tr>
<th>Age Interval (x)</th>
<th>No. of Deaths (Dx)</th>
<th>% of Deaths (dx)</th>
<th>Survivors Entering (lx)</th>
<th>Probability of Death (qx)</th>
<th>Total Years Lived Between X and X+5 (Lx)'</th>
<th>Total Years Lived After Lifetime (Tx)</th>
<th>Life Expectancy (e^x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;.9 years</td>
<td>4</td>
<td>4.04</td>
<td>100.00</td>
<td>.0404</td>
<td>489.90</td>
<td>2538.200</td>
<td>25.38</td>
</tr>
<tr>
<td>1-4.9 yrs</td>
<td>35</td>
<td>35.35</td>
<td>95.96</td>
<td>.3684</td>
<td>391.43</td>
<td>2048.300</td>
<td>21.35</td>
</tr>
<tr>
<td>5-9.9 yrs</td>
<td>7</td>
<td>7.07</td>
<td>60.61</td>
<td>.1166</td>
<td>285.38</td>
<td>1656.875</td>
<td>27.34</td>
</tr>
<tr>
<td>10-14.9 yrs</td>
<td>1</td>
<td>1.01</td>
<td>53.54</td>
<td>.0189</td>
<td>265.18</td>
<td>1371.500</td>
<td>25.62</td>
</tr>
<tr>
<td>15-19.9 yrs</td>
<td>2</td>
<td>2.02</td>
<td>52.53</td>
<td>.0385</td>
<td>257.60</td>
<td>1106.325</td>
<td>21.06</td>
</tr>
<tr>
<td>20-24.9 yrs</td>
<td>7</td>
<td>7.07</td>
<td>50.51</td>
<td>.1400</td>
<td>234.88</td>
<td>848.725</td>
<td>16.80</td>
</tr>
<tr>
<td>25-29.9 yrs</td>
<td>9</td>
<td>9.09</td>
<td>43.44</td>
<td>.2092</td>
<td>194.48</td>
<td>613.850</td>
<td>14.13</td>
</tr>
<tr>
<td>30-34.9 yrs</td>
<td>12</td>
<td>12.12</td>
<td>34.35</td>
<td>.3528</td>
<td>141.45</td>
<td>419.375</td>
<td>12.21</td>
</tr>
<tr>
<td>35-39.9 yrs</td>
<td>1</td>
<td>1.01</td>
<td>22.23</td>
<td>.0454</td>
<td>108.63</td>
<td>277.925</td>
<td>12.50</td>
</tr>
<tr>
<td>40-44.9 yrs</td>
<td>6</td>
<td>6.06</td>
<td>21.22</td>
<td>.2856</td>
<td>90.95</td>
<td>169.300</td>
<td>7.98</td>
</tr>
<tr>
<td>45-49.9 yrs</td>
<td>7</td>
<td>7.07</td>
<td>15.16</td>
<td>.4664</td>
<td>58.13</td>
<td>78.350</td>
<td>5.17</td>
</tr>
<tr>
<td>50-54.9 yrs</td>
<td>8</td>
<td>8.08</td>
<td>8.09</td>
<td>.9988</td>
<td>20.23</td>
<td>20.225</td>
<td>2.50</td>
</tr>
<tr>
<td>55-59.9 yrs</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>.0000</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
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<td>99.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Dx = number who died before reaching the next age group; dx = percentage of the Dx data; lx = percentage of survivors who reached the next age group, qx = the probability of death; Lx = the total number of years lived by all individuals during each interval; Tx = the total number of years remaining in the lifetimes of all of the individuals entering each age interval; e^x = the average number of years an individual can expect to live (Ubelaker 1989:139-140).

interval (Figure 5.7). The curve exhibits a sharp decline after the age group of 1 to 4.9 years and then a gradual decline after the 5 to 9.9 year ages. Life expectancy of the Manuelito Plateau sample, as shown in figure 5.8, demonstrates the same sharp decline from birth to 4.9 years seen in the survivorship curve, with an increase in life expectancy.
Figure 5.6. Manuelito Plateau Percentage of Deaths (dx).

Figure 5.7. Manuelito Plateau Survivorship Curve Based on (lx).
after 4.9 years of age. After 9.9 years, there is a steady decrease in life expectancy with a slight increase after the 30 to 34.9-age interval. This indicates that there was an increased chance of death between the ages of 1 and 4.9 years of age, but a slight increase in life expectancy between the age of 34.9 and 39.9 years.

To be able to compare life table values from within the Ancestral Puebloan region, general groupings of the ages into fetal, infant, child, adolescent, young adult, middle adult, and older adult were made to give an overall idea of the percentages of death (dx), survivorship (lx), and life expectancy (e^x). Due to incomplete published data from within the region, only three other sub-regions could be used for comparison. These include Mesa Verde (late sites), Black Mesa (all of the sample), and EPNG – Tohatchi Flats (all pueblo sites). Figure 5.9 illustrates that the Manuelito Plateau and EPNG – Tohatchi Flats pueblo samples exhibited a greater percent of infant deaths, with Black Mesa, and Mesa Verde samples exhibiting the greatest percentage of deaths during
childhood. All the samples declined in the percentage of deaths during adolescence, but the most deaths occurred in the next age interval during the young adult age for Manuelito Plateau, Black Mesa, and Mesa Verde. The EPNG – Tohatchi Flats pueblo sample peaked during the next age range of middle adult, which was distinct from the pattern for the Black Mesa sample. These dissimilarities could be explained by differing analytical methods, specifically related to ageing techniques used, and because original investigators grouped age ranges differently, comparisons were difficult.

The survivorship curve \((l_x)\) indicates what percentage of a theoretical original population of 100 persons would remain alive at the end of each five-year period (Ubelaker 1989:137). For the comparative regions, the survivorship curve \((l_x)\) was consistent suggesting that these sites were similar (Figure 5.10). The greatest difference can be seen in the infant interval. The EPNG sample had the lowest percentage of deaths during the infant age category, and the Mesa Verde sample had the greatest number of deaths. Manuelito Plateau sample had the fewest deaths during the adolescent category. Beyond these extremes, the Manuelito Plateau and comparative regions follow similar patterns. Again, the Black Mesa sample had a greater percentage of older individuals compared to the other surviving populations.

The Black Mesa sample exhibited a life expectancy pattern that was above all of the other regional samples, but similar in configuration to Manuelito Plateau (Figure 5.11). This difference can be explained by the use of different aging categories and techniques used during the analysis of the Black Mesa sample. The similar patterning of peaks and declines suggests that these two samples shared attributes that were reflected in
Figure 5.9. Regional Comparison of Percentage of Deaths (dx).

Figure 5.10. Regional Comparison of Survivorship (lx).

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the life expectancy of the populations. In addition, the EPNG-Tohatchi Flats and Mesa Verde samples have very similar patterns. These pairings may indicate closer relationships between these samples, or similar social or environmental factors.

Nutritional Indicators

Stature

Stature was only estimated on those individuals with complete enough skeletal elements to provide accurate measurements. Stature was estimated for eighteen adult males and eighteen adult females. This sample included at least one individual from each of the six research sites (Table 5.4). The mean male stature estimate was 162.74 cm and
the mean female estimate was 152.64 cm. The overall mean stature for the 36 individuals was 157.69 cm.

The Manuelito Plateau male and female stature estimates were compared to an historic Mexican population sample used by Genoves (1967). Two-tailed unpaired T-tests comparing Manuelito Plateau male (n=18) and female (n=18) stature means to the male (n=22), and female (n=15) statures used by Genoves’ were found to not be significant (female $t=1.0225$, df=31, $p=0.3145$; male $t=0.5574$, df=38, $p=0.5574$). This supports the assumption that the Manuelito Plateau sample falls within the typical stature estimate for the Southwestern region.

When regional samples were compared to Genoves’ male study group (n=22) with the two-tailed unpaired T-test, males from the Dolores Archaeological Project ($t=0.4051$, df=46, $p=0.6873$) (n=26), Chaco small sites ($t=1.758$, df=35, $p=0.0875$) (n=15), and the Tohatchi Flats (EPNG) ($t=1.972$, df=33, $p=0.0570$) (n=13) sites, they were found to not be statistically significantly different. The Black Mesa samples could not be used in this comparison, as the raw data was not published. When the females from these same regional groups were compared to the Genoves’ study, a different pattern from the males was evident.

The females from the Dolores Archaeological Project (n=24) were found to be very statistically significantly different from the Genoves’ females (n=15) ($t=3.098$, df=37, $p=0.0037$) when compared using a two-tailed unpaired T-test. The Chaco small sites females (n=22) were statistically significantly different ($t=4.2667$, df=35, $p=0.0001$), and the females from Tohatchi Flats (EPNG) (n=13) were significantly taller ($t=2.4601$, df=26, $p=0.0209$) than the Genoves female group. These stature differences
Table 5.4. Manuelito Plateau Stature Estimates.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Male Mean Stature (cm)</th>
<th>Male n=</th>
<th>Female Mean Stature (cm)</th>
<th>Female n=</th>
<th>Overall Mean Stature (cm)</th>
<th>M/F Ratio</th>
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<tbody>
<tr>
<td>LA31240</td>
<td>167.00</td>
<td>3</td>
<td>157.50</td>
<td>5</td>
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<td>1.060</td>
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<td>LA31247</td>
<td>163.41</td>
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<td>153.60</td>
<td>5</td>
<td>159.63</td>
<td>1.064</td>
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<td>LA31249</td>
<td>148.00</td>
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<td>4</td>
<td>142.33</td>
<td>3</td>
<td>151.93</td>
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<td>LA31284</td>
<td>168.25</td>
<td>2</td>
<td>152.17</td>
<td>3</td>
<td>158.60</td>
<td>1.106</td>
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<tr>
<td>LA121585</td>
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<td>155.00</td>
<td>1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Overall</td>
<td>162.74</td>
<td>18</td>
<td>152.64</td>
<td>18</td>
<td>157.69</td>
<td>1.070</td>
</tr>
<tr>
<td>Genoves*</td>
<td>161.49</td>
<td>22</td>
<td>149.80</td>
<td>15</td>
<td>155.65</td>
<td>1.078</td>
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</tbody>
</table>

* = Genoves 1967:72

Table 5.5. Ancestral Puebloan Stature Estimates.

<table>
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<tr>
<th>Population Group</th>
<th>Male Mean Stature (cm)</th>
<th>Male n=</th>
<th>Female Mean Stature (cm)</th>
<th>Female n=</th>
<th>Overall Mean Stature (cm)</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manuelito Sites</td>
<td>162.74</td>
<td>18</td>
<td>152.64</td>
<td>18</td>
<td>157.69</td>
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<td>Tohatchi Flats (EPNG) Pueblo Sites*</td>
<td>164.22</td>
<td>13</td>
<td>156.00</td>
<td>13</td>
<td>162.73</td>
<td>Martin et al. 1991:97</td>
</tr>
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<td>Black Mesa (late) Kayenta</td>
<td>163.10</td>
<td>Unk</td>
<td>152.50</td>
<td>Unk</td>
<td>157.80</td>
<td>Spurr 1993:174</td>
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<tr>
<td>Black Mesa NAGPRA Sites</td>
<td>163.40</td>
<td>Unk</td>
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<td>Unk</td>
<td>157.60</td>
<td>Akins 1986:135-137</td>
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<tr>
<td>Chacoan Small Sites</td>
<td>164.70</td>
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<td>157.40</td>
<td>22</td>
<td>161.10</td>
<td>Stodder 1986:372</td>
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<tr>
<td>Mesa Verde/DAP</td>
<td>162.10</td>
<td>26</td>
<td>155.60</td>
<td>24</td>
<td>158.85</td>
<td></td>
</tr>
<tr>
<td>Overall Mean</td>
<td>163.48</td>
<td>72</td>
<td>154.32</td>
<td>77</td>
<td>159.31</td>
<td></td>
</tr>
<tr>
<td>Mexican</td>
<td>161.49</td>
<td>22</td>
<td>149.80</td>
<td>15</td>
<td>155.65</td>
<td>Genoves 1967:72</td>
</tr>
</tbody>
</table>

* Only sites LA80377, LA80440, LA80934, LA2508C
Unk  - Unknown
could be the result of differential access to nutrition during childhood into adolescence for females from these particular regions or the result of small samples sizes. In addition, different methods used in generating stature estimates could also have resulted in the differences between samples.

Comparisons of mean stature estimates with other Ancestral Puebloan sites outside of the Manuelito Plateau area show a seemingly consistent pattern of height measurements (Table 5.5). When males from Manuelito Plateau (n=18) were compared with the Dolores Archaeological Project (n=26), Tohatchi Flats (EPNG) (n=13), and the Chaco small sites (n=15) using the two-tailed unpaired T-test, no statistically significant differences were found (DAP t=0.4108, df=42, p=0.6833; Tohatchi Flats (EPNG) t=1.293, df=29, p=0.2063; Chaco t=1.011, df=31, p=0.3199). Tohatchi Flats (EPNG) and Dolores Archaeological Project females were then compared using the two-tailed unpaired T-test to Manuelito Plateau females (n=18) and showed no statistically significant difference (Tohatchi Flats (EPNG)(n=13) t=1.289, df=29, p=0.2078; DAP (n=24) t=1.551, df=40, p=0.1289). However, a statistically significant difference was found between the Manuelito females (n=18) and the Chaco females (n=22) (t=2.601, df=38, p=0.0132). This result further supported the observation that the females from Chaco Canyon were taller that the rest of the regional sample (Figure 5.12).

Of the 12 females buried with grave goods for which a stature estimate could be calculated, the mean stature was 152.75 cm (Table 5.6). The mean stature estimate of the females buried without grave goods (n=6) was 152.42 cm. Those males buried with grave goods (n=10) had an overall mean stature estimate of 164.98 cm and the males buried without grave goods (n=8) had a mean stature estimate of 159.94 cm (Table 5.7).
When the stature estimates of males buried with and without grave goods were compared using a two-tailed unpaired T-test ($t=1.635$, $df=16$, $p=0.1216$) they were not found to be statistically significant. However, the observed frequency differences suggest that small sample size may have contributed to this difference or that males buried without grave goods were possibly more nutritionally stressed than the males buried with grave goods, which resulted in a shorter average height (Figure 5.13). When females were compared using a two-tailed unpaired T-test, no significant difference could be observed ($t=0.081$, $df=16$, $p=0.9366$). The frequency differences in the average stature estimates among the Manuelito Plateau females buried with and without grave goods were small, as was the sample size, and therefore no conclusion concerning differences between females buried with or without grave goods could be made (Figure 5.14).
Figure 5.12. Stature Comparisons within the Ancestral Puebloan Region.
Figure 5.13. Manuelito Plateau Male Stature Means.

Figure 5.14. Manuelito Plateau Female Stature Means.
Table 5.7. Mean Male Stature Estimates from Manuelito Plateau with and without Grave Goods.

<table>
<thead>
<tr>
<th>Site Numbers</th>
<th>Males w/ GG Mean Stature (cm)</th>
<th>Male (n=)</th>
<th>Males w/o GG Mean Stature (cm)</th>
<th>Male (n=)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA31240</td>
<td>168.75</td>
<td>2</td>
<td>163.50</td>
<td>1</td>
</tr>
<tr>
<td>LA31247</td>
<td>166.56</td>
<td>4</td>
<td>164.0</td>
<td>2</td>
</tr>
<tr>
<td>LA31249</td>
<td>148.00</td>
<td>1</td>
<td>156.50</td>
<td>2</td>
</tr>
<tr>
<td>LA31277</td>
<td>161.50</td>
<td>1</td>
<td>158.33</td>
<td>3</td>
</tr>
<tr>
<td>LA31284</td>
<td>168.25</td>
<td>2</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>LA121585</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>Overall Mean</td>
<td>164.98</td>
<td>10</td>
<td>159.94</td>
<td>8</td>
</tr>
</tbody>
</table>

Porotic Hyperostosis, Cribra Cranii and Cribra Orbitalia

Since porotic hyperostosis, cribra cranii, and cribra orbitalia have been considered by most researchers as separate disease entities that develop in response to nutritional stress, the results of the frequency analyses were separated to reflect these differences. Table 5.8 summarizes the raw counts and frequency results grouped by age. Though there were many categories with no incidents of the disease process, the overall trend was common for prehistoric Southwest populations. In a comparison of adults and subadults with porotic hyperostosis, an age related pattern of more subadults (n=14) than adults (n=1) exhibited active or active and healed disease expression (Figure 5.15).

Cribra cranii was only found in subadults as active or active and healed, and only one adult had a healed expression of this bony reaction (Figure 5.16). The incidence of active and healed or active expression of cribra orbitalia was more prevalent in subadults (n=17), with no adults exhibiting active or healed and active bone reaction related to this
Table 5.8. Summary of Porotic Hyperostosis, Cribra Cranii and Cribra Orbitalia from Manuelito Plateau.

<table>
<thead>
<tr>
<th>Age &amp; Sex</th>
<th>Porotic Hyperostosis</th>
<th>Cribra Cranii</th>
<th>Cribra Orbitalia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active</td>
<td>Active and Healed</td>
<td>Healed</td>
</tr>
<tr>
<td>Adults</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td>0%</td>
<td>4.6% (n=1)</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Adults</td>
<td></td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Total Adults</td>
<td></td>
<td>0%</td>
<td>1.9% (n=1)</td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td>13.3% (n=2)</td>
<td>20% (n=3)</td>
</tr>
<tr>
<td>Infants</td>
<td></td>
<td>27.5% (n=8)</td>
<td>3.5% (n=1)</td>
</tr>
<tr>
<td>Fetal</td>
<td></td>
<td>33.3% (n=1)</td>
<td>0%</td>
</tr>
<tr>
<td>Totals Subadults</td>
<td></td>
<td>23.4% (n=11)</td>
<td>8.5% (n=4)</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>11.1% (n=11)</td>
<td>5.1% (n=5)</td>
</tr>
</tbody>
</table>
Figure 5.15. Proportion of Porotic Hyperostosis in the Manuelito Plateau Sample.

Figure 5.16. Proportion of Cribra Cranii in the Manuelito Plateau Sample.
disease expression (Figure 5.17). Only five adults had healed instances of cribra orbitalia with thirteen subadults with active disease expression, two with active and healed expression, and two with healed bony reaction.

A chi-square test was conducted to determine if the expression of porotic hyperostosis (including cribra cranii and cribra orbitalia) was more prevalent in subadults than adults. Subadults and adults were grouped by disease expression with 27 subadults with disease expression and six without disease, and 20 adults with expression and four without. Any indication of the disease process was counted as the presence of the disease expression, from active to healed. The absence of the disease expression was indicated by no observable boney response. The results showed that there was not a statistically significant difference at the .05 level ($\chi^2 = 0.022$, df = 1, $p \leq 0.1$) between the ages and the manifestation of disease expressions usually associated with iron deficiency anemia.
The chi-square test was also performed for the presence and absence of porotic hyperostosis in adults and subadults. Sixteen subadults and 18 adults had the disease expression. Fifteen subadults and six adults did not exhibit this particular disease expression. The results indicated that of the 31 subadults and 24 adults, the distribution was not statistically significant at the .05 level ($X^2 = 3.135$, df = 1, $p \leq 0.10$). This supported the overall conclusion that the manifestation of the disease was not significantly different when compared between gross age groups of adults and subadults.

Yet, when adults ($n=21$) and subadults ($n=21$) observed for evidence of cribra orbitalia were submitted to a chi-square analysis, the distribution was found to be significant at the .05 level ($X^2 = 13.745$, df = 1, $p \leq 0.001$). Cribra orbitalia was found in 17 subadults and five adults. The result of this statistical test suggested that there was an age differentiation in the development of cribra orbitalia among the Manuelito Plateau sample between adults and subadults. Chi-square analysis could not be conducted for the disease expression of cribra cranii due to small values. Only one adult had cribra cranii out of 13 observable individuals and only five subadults had evidence of this disease expression out of 24 subadults. A Fishers Exact test was performed between the presence and absence of the disease in adults and subadults. The results of the two-sided test ($p$-value of 0.394), suggested that 39.4% of the differences between the age groups and may have been due to chance.

When males and females were examined for the presence of these disease expressions no indication of active bone reactions were observed and only one male exhibited active and healed bone reactions (Tables 5.9 and 5.10). A majority of the bone reactions observed was healed or not present for both males and females.
Figures 5.18 and 5.19 present the comparison of males overall (n=22) with males with grave goods (n=11) and males without grave goods (n=11) that showed boney reactions from porotic hyperostosis and cribra orbitalia. No cribra cranii was observed among the males from the Manuelito Plateau sites therefore no statistical analysis could be conducted.

Boney reactions related to porotic hyperostosis were more prevalent among males buried with grave goods with both active and healed (9.1%, n=1), or healed (45.5%, n=5) expressions present (Figure 5.18). Males buried without grave goods exhibited healed incidences of porotic hyperostosis (36.7%, n=4). All of the male individuals had expressions of porotic hyperostosis, however observations of 63.6% (n=7) could not be made due to incomplete skeletal remains (Figure 5.18).

Among males from Manuelito Plateau, there were no incidences of observable active or active and healed bone responses related to cribra orbitalia. Males with grave goods had a low occurrence of healed bone (18.2%, n=2), and a high incidence of no bone reaction related to this disease process (63.6%, n=7) (Figure 5.19). Males without grave goods had a low occurrence of healed expression (9.1%, n=1) and a low occurrence of no expression (18.2%, n=2), but like the males without grave goods observed for porotic hyperostosis a large number (72.7%, n=8) could not be observed for the presence of this disease (Figure 5.19). This was due to poor preservation and missing bone elements that prevented the observation of this disease expression.

Figures 5.20, 5.21, and 5.22 present the comparisons of Manuelito Plateau females (n=21), with females with grave goods (n=11), and females without grave goods (n=10), which showed boney reactions of porotic hyperostosis, cribra cranii, and cribra
Table 5.9. Proportion of Porotic Hyperostosis, Cribra Cranii and Cribra Orbitalia of the Burials with Grave Goods from the Manuelito Plateau Sites.

<table>
<thead>
<tr>
<th></th>
<th>Porotic Hyperostosis</th>
<th>Cribra Cranii</th>
<th>Cribra Orbitalia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
<td>Active</td>
<td>A/H</td>
</tr>
<tr>
<td>Male</td>
<td>0%</td>
<td>9.1%</td>
<td>45.5%</td>
</tr>
<tr>
<td></td>
<td>(n=11)</td>
<td>(n=1)</td>
<td>(n=5)</td>
</tr>
<tr>
<td>Female</td>
<td>0%</td>
<td>0%</td>
<td>45.5%</td>
</tr>
<tr>
<td></td>
<td>(n=11)</td>
<td>(n=5)</td>
<td>(n=3)</td>
</tr>
<tr>
<td>Indet.</td>
<td>27.3%</td>
<td>9.1%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>(n=9)</td>
<td>(n=3)</td>
<td>(n=1)</td>
</tr>
<tr>
<td>Totals</td>
<td>9.7%</td>
<td>6.5%</td>
<td>32.3%</td>
</tr>
<tr>
<td></td>
<td>(n=31)</td>
<td>(n=3)</td>
<td>(n=10)</td>
</tr>
</tbody>
</table>

Table 5.10. Proportion of Porotic Hyperostosis, Cribra Cranii and Cribra Orbitalia of the Burials without Grave Goods from Manuelito Plateau Sites.

<table>
<thead>
<tr>
<th></th>
<th>Porotic Hyperostosis</th>
<th>Cribra Cranii</th>
<th>Cribra Orbitalia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
<td>Active</td>
<td>A/H</td>
</tr>
<tr>
<td>Male</td>
<td>0%</td>
<td>0%</td>
<td>36.7%</td>
</tr>
<tr>
<td></td>
<td>(n=11)</td>
<td>(n=1)</td>
<td>(n=4)</td>
</tr>
<tr>
<td>Female</td>
<td>0%</td>
<td>0%</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>(n=10)</td>
<td>(n=3)</td>
<td>(n=1)</td>
</tr>
<tr>
<td>Indet.</td>
<td>17%</td>
<td>6.4%</td>
<td>2.1%</td>
</tr>
<tr>
<td></td>
<td>(n=47)</td>
<td>(n=8)</td>
<td>(n=3)</td>
</tr>
<tr>
<td>Totals</td>
<td>11.8%</td>
<td>4.4%</td>
<td>11.8%</td>
</tr>
<tr>
<td></td>
<td>(n=68)</td>
<td>(n=3)</td>
<td>(n=8)</td>
</tr>
</tbody>
</table>
Figure 5.18. Proportion of Porotic Hyperostosis among Manuelito Plateau Males.

Figure 5.19. Proportion of Cribra Orbitalia among Manuelito Plateau Males.
orbitalia. There were no females with active or healed and active expressions of porotic hyperostosis from Manuelito Plateau; they had only healed expressions (Figure 5.20). Females with grave goods had a higher incident of healed bone expression (45.5%, n=5), than either no expression (27.3%, n=3), or unobservable expression (27.3%, n=3). Only 20% (n=2) of females without grave goods had healed expressions, and like the males without grave goods, 70% (n=7) were unobservable for this particular boney reaction due to missing elements or poor preservation. As with the males from Manuelito Plateau, when statistical analysis was attempted on combined data of females with disease expression vs. the presence or absence of grave goods there were no females with disease expression without some form of porotic hyperostosis, thus a zero value was present.

The Fishers Exact test was conducted on the presence and absence of porotic hyperostosis in all of those individuals with evidence of porotic hyperostosis (including cribra cranii and cribra orbitalia) buried with grave goods (n=26) and those without grave goods (n=31) regardless of age or sex. The p-value of 0.7411 of the two-tailed test indicates that there was a 74.1% probability that the relationship between these factors was due to chance. This suggests that the presence of porotic hyperostosis was not related to whether or not an individual was buried with or without grave goods. The size of the sample should be considered when interpreting this result.

The incidence of cribra cranii within the Manuelito Plateau sample was much lower than either porotic hyperostosis or cribra orbitalia. This was likely because observations for this disease expression were difficult in a field setting. If the cranium was full of soil, and there was no time to excavate, observation of the interior could not
be completed. There was only one incident of healed cribra cranii observed among females (10%), and one female had no disease expression (10%), (Figure 5.21). These were within the group buried without any grave goods. Eighty percent (n=8) of the females without grave goods could not be assessed for cribra cranii. Again, this was due to missing bone elements and the in-field analysis situation that made it difficult to observe the interior of the cranial vault. Females with grave goods had more instances of no disease expression (45.5%, n=5), and 54.6% (n=6) of the females were unobservable. Since there was one incident of healed expression among the females without grave goods this may indicate that this group was under more stress than the females buried with grave goods, but a sample of one is too small to draw any conclusions.

The frequency of the expression of cribra orbitalia among females without grave goods was the same as those females without grave goods that were examined for cribra cranii (Figure 5.22). There were more females with grave goods that had no disease

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expression than the rest of the female groups (54.6%, n=6), but not as many as the males with grave goods (63.6%, n=7). However, the females had only one instance (9.1%) of healed cribra orbitalia, and the males had 18.2% (n=2). A Fisher Exact test was run on males and females without cribra orbitalia and with grave goods (n=13), males and females without cribra orbitalia with grave goods (n=3), males and females without cribra orbitalia and without grave goods (n=3), and those males and females with cribra orbitalia and grave goods (n=2). The p-value=0.553 indicates that there was 55.3% probability that the difference between individuals with the disease expression and whether or not they were buried with grave goods was due to chance.

Because of inconsistent observations and reporting of porotic hyperostosis, cribra orbitalia, and cribra cranii in Southwestern populations, only comparisons on a general level were possible to complete. Martin et al. 1991:160, Stodder 1984: 114-119, and Walker 1985:143 summarized data related to porotic hyperostosis and cribra orbitalia. Figures 5.23 and 5.24 present frequency patterns from sites surrounding Manuelito Plateau.

Sites can be grouped by similar frequency results. Manuelito Plateau and Black Mesa have similar patterns of adults and subadults for both porotic hyperostosis and cribra orbitalia. Both age groupings have similar development of porotic hyperostosis, with Black Mesa exhibiting a greater percentage of individuals affected (subadults 85.4%, n=47; adults 89.3%, n=59) than Manuelito Plateau (subadults 34% n=16, adults 34.6% n=18). More Black Mesa subadults (84.2%, n=32) than adults (32%, n= 17) exhibit boney reactions related to cribra orbitalia, likewise more Manuelito Plateau subadults (36%, n=17) than adults (9.6% n=5) were affected.
Figure 5.21. Proportion of Cribra Cranii among Manuelito Plateau Females.

Figure 5.22. Proportion of Cribra Orbitalia among Manuelito Plateau Females.
Figure 5.23. Proportion of Porotic Hyperostosis Related to Age within the Ancestral Puebloan Region.

Figure 5.24. Proportion of Cribra Orbitalia Related to Age within the Ancestral Puebloan Region.
When the porotic hyperostosis pattern in relation to adults and subadults between Manuelito Plateau and Black Mesa samples were submitted to a chi-square test, the results were not statistically significant at the .05 level ($X^2=0.0769$, df = 1, $p<1$). The cribra orbitalia comparison was not found to be significant at the .05 level ($X^2=1.0167$, df = 1, $p<1$). The differences were not significant and the patterns of frequency data suggest that both sample groups may have experienced similar nutritional stress.

**Dental Caries and Abscesses**

Table 5.11 presents the dental carries and dental abscess data for the Manuelito Plateau sample. Out of the 22 male burials eight (27.5%) were observed to have a total of 24 caries, eight had no caries (36.4%), and six (27.3%) could not be observed for carious lesions due to either missing or broken teeth. Abscesses were observed in ten (45.5%) of the male burials, with a total of 26 abscesses. Five individuals (22.7%) did not have abscesses and seven (31.8%) could not be observed for the presence of abscesses. Not all of the dentition could be observed due to postmortem or antimortem tooth loss. The total number of teeth observed was 329, which represented 46.7 percent if full sets of observable teeth were present ($n=704$).

Of the 21 female burials, four individuals (19%) had 12 caries, nine (42.9%) did not have caries and eight (38.1%) could not be observed for lesions. Five females (23.8%) had 11 abscesses, six (28.6%) had no abscesses and eight (38.1%) could not be observed. The total number of teeth observed was 216, which represents 32.1% of the total possible dentition. The subadults from Manuelito Plateau exhibited no dental pathologies including carious lesions and abscesses.

The overall dental health pattern of all of the individuals from the six Manuelito Plateau sites indicates that there were slightly more abscesses (5.5%, $n=42$) than caries.
Adult males had more dental caries (7.3%, n=24), and abscesses (7.9%, n=26), and the greatest number of observable teeth (46.7%, n=329) than females, indeterminate adults, and subadults. The high number of observable dental pathologies among males from Manuelito Plateau may be the result of the greater number of recovered teeth. With this in mind, the frequency pattern still suggested that there was a decline in dental health related to advanced age within the individuals buried at the six sites from Manuelito Plateau. This pattern was to be expected as dental health usually deteriorates with increased age (Martin et al. 1991; Stoddard 1984).

Table 5.12 presents the data of the Manuelito Plateau sample that were buried with grave goods. Out of the 11 male burials, five (45.5%) were observed to have 12 caries, five (45.5%) had no caries, and one (9.1%) could not be observed for carious lesions. Abscesses were observed in seven (63.6%) of the male burials with grave goods for a grand total of 16 abscesses. Two (18.2%) did not have abscesses, and two (18.2%) could not be observed for lesions. The total number of teeth present was 214, which represents 60.8 percent if full sets of observable teeth were present.

Of the 11 females buried with grave goods two individuals (18.2%) had three caries, six (54.5%) did not have caries, and three (27.3%) were unobservable for carious lesions. Five females (45.5%) had 11 abscesses, three (27.3%) did not have abscesses and three (27.3%) could not be observed. The total number of teeth observed was 134, which represented 38.1 percent of the dentition. Again, no subadults (n=9) had caries or abscesses.

The overall dental pattern for individuals buried with grave goods indicated that females had more dental caries (6.7%, n=9), and abscesses (8.2%, n=11), but males had...
Table 5.11. Summary of Dental Caries, Dental Abscesses, and the Total Number of Teeth Observed for the Manuelito Plateau Sites.

<table>
<thead>
<tr>
<th>Age &amp; Sex</th>
<th>Dental Caries</th>
<th>Dental Abscesses</th>
<th>Observed Teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With Caries</td>
<td>Without Caries</td>
<td>Unobs.</td>
</tr>
<tr>
<td>Adult Males (n=22)</td>
<td>8</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Adult Females (n=21)</td>
<td>4</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Adults Indet. (n=9)</td>
<td>0</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Total Adults (n=52)</td>
<td>12</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Children (n=15)</td>
<td>0</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Infants (n=29)</td>
<td>0</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Fetal (n=3)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Subadults (n=47)</td>
<td>0</td>
<td>15</td>
<td>32</td>
</tr>
<tr>
<td>Totals (n=99)</td>
<td>12</td>
<td>33</td>
<td>54</td>
</tr>
</tbody>
</table>

* erupted dentition only
Table 5.12. Dental Caries, Dental Abscesses, and Total Number of Teeth Observed of the Burials with Grave Goods from the Manuelito Plateau.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Dental Caries</th>
<th>Dental Abscesses</th>
<th>Observed Teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Unobs.</td>
</tr>
<tr>
<td>Males (n=11)</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Females (n=11)</td>
<td>2</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Indet. (n=9)</td>
<td>0</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Totals (n=31)</td>
<td>7</td>
<td>16</td>
<td>8</td>
</tr>
</tbody>
</table>

Unobs. - Unobservable
Indet. - Indeterminate Sex

Table 5.13. Dental Caries, Dental Abscesses, and Total Number of Teeth Observed of the Burials without Grave Goods from the Manuelito Plateau.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Dental Caries</th>
<th>Dental Abscesses</th>
<th>Observed Teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Unobs.</td>
</tr>
<tr>
<td>Males (n=11)</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Females (n=10)</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Indet. (n=47)</td>
<td>0</td>
<td>11</td>
<td>36</td>
</tr>
<tr>
<td>Totals (n=68)</td>
<td>5</td>
<td>17</td>
<td>46</td>
</tr>
</tbody>
</table>

Unobs. - Unobservable
Indet. - Indeterminate Sex
more observable teeth (60.8%, n=214). The frequency results suggested a sex
differentiation and an age related pattern within the individuals buried with grave goods.
Females have poorer dental health than males and with increasing age, the dental health
of this segment of the population decreased, with adults exhibiting more dental
pathologies than individuals less than 20 years of age.

Table 5.13 presents the data of the Manuelito Plateau sample that were not buried
with grave goods. Out of the 11 male burials three (27.3%) were observed to have a total
of 12 caries, three (27.3%) had no caries, and five (45.5%) could not be observed for
carious lesions.

Abscesses were observed in three (27.3%) of the male burials with a total of ten
abscesses present (8.7%). Three individuals (27.3%) had no abscesses and five (45.5%)
were not observable. The total number of teeth present was 115, which represents 59.9
percent if full sets of observable teeth were present.

Of the 10 female burials with grave goods, two (20%) individuals had three
caries, three (30%) did not have caries and five (50%) were unobservable for lesions.
Two females (20%) had five abscesses, three (30%) did not have abscess and five (50%)
were unobservable. There were a total of 82 teeth, representing 51.3 percent of a total
possible dentition. Again, no subadults exhibited any dental pathology.

The overall general dental health pattern exhibited by the individuals buried
without grave goods indicates that males had more dental caries (10.4%, n=12), abscesses
(8.7%, n=10), and observable teeth (59.9%, n=115) than females or subadults. The higher
expression of dental pathologies among males was likely due to the greater number of
teeth recovered from males as opposed to females. Along with the low overall sample size, the frequency data may or may not reflect a possible relationship between an older age resulting in poorer dental health.

Fishers exact analysis was conducted on the males and females buried with and without grave goods and with and without dental pathologies. When the females with dental pathologies and with grave goods (n=6), and without grave goods (n=3), were compared statistically to females without pathologies and with grave goods (n=2) and without grave goods (n=2), the results indicated that there was a 51% probability that there was no relationship between female dental health and the presence of grave goods (p-value of 0.5105). When males were tested using the same criteria (males with pathology and grave goods n= 7, males with pathology and without grave goods n= 4, males without pathology and with grave goods n= 3, and males without pathologies and without grave goods n= 2) the Fisher Exact test resulted in a p-value of 0.6539, which indicated that there was a 65.4% probability that a relationship between male dental health and the presence of grave goods among the males from Manuelito Plateau existed.

Comparison of dental data with other Southwestern regions proved to be a challenge due to limited reporting and differing data presentations. Raw data was particularly difficult to access and in most instances impossible to find. Only generalizations were attained for comparison to the results of the Manuelito Plateau sample.

For the Tohatchi Flats pueblo sites, nine had carious lesions (Flores and Kearns 1996: 189). Seven males (77.8%), one indeterminate adult (11.1%) and one child (11.1%)
had at least one cavity observed from three different sites. Sixteen caries from 150 observable teeth were recorded (10.7%). No cavities were observed in female dentition.

From the Black Mesa region, females exhibited a slightly higher frequency of carious lesions and tooth loss, and males had a higher degree of attrition, alveolar resorption, and dental abscessing (Martin et al. 1991: 189). The differences observed in the Black Mesa sample were attributed to diet, with males eating a rougher diet that was less heavily based on sticky gruels that caused cavities (Martin et al. 1991: 190).

The report for the Duckfoot site, located near Mesa Verde, provided cross tabulation data involving caries and abscesses. More adults (61.5%, n=8) than subadults (38.5%, n=13) had carious lesions, and males (62.5%, n=8) exhibited a greater frequency of caries than females (37.5%, n=3). In fact, the distribution of age status was significant ($X^2=10.18$, df =3, $p \leq 0.017$) (Hoffman 1993: 285). The number of abscesses were also greater in adults (61.5%, n=8) than subadults (38.5%, n= 5), and more males (62.5%, n=8) than females (37.5%, n=3) developed abscesses. This distribution of abscesses by age was also statistically significant ($X^2=9.48$, df=2, $p \leq 0.017$) (Hoffman 1993:285-286). Though this data analysis was intriguing the small cell sizes must be taken into consideration when making comparisons.

The comparison between the frequency of dental pathology from the Duckfoot site and Manuelito sites (Figures 5.25 and 5.26) portrayed a similar pattern of expression, with similar age and sex distributions from the two different regions. This pattern was also evident within the EPNG-Tohatchi Flats Pueblo sites, but the Black Mesa sites had more females than males with dental cavities, and more males than females with
abscessing. These differences may be related to access to different food resources, which can also explain the similarities found within the Ancestral Puebloan region.

Figure 5.25. Manuelito Plateau vs. Mesa Verde (Duckfoot Site) Dental Carie Distribution.

Figure 5.26. Manuelito Plateau vs. Mesa Verde (Duckfoot Site) Dental Abscess Distribution.
Mortuary Practices

Variables examined in terms of mortuary practice at the Manuelito Plateau sites included the presence or absence of grave goods, burial positioning, and burial location within the site. These in turn will be related back to health indicators to determine patterns that relate to the hypothesis.

Grave Goods

Burials associated with grave goods were found at all of the six sites from Manuelito Plateau (Table 5.14). There were 47 (47.5%) primary burials, five (5%) secondary burials, and 47 (47.5%) burials from unknown contexts. Of the 52 discrete burials from the Manuelito Plateau sample 29 (55.8%) were buried with associated grave goods. Of the discrete burials, 23 individuals (44.2%) were buried without grave goods. Nine of the burials with grave goods were female (31%), 11 were male (38%), and nine were subadults (31%). A cross-tabulation of these age groupings and the number of grave goods associated with each group was generated for Table 5.15. A chi-square analysis comparing those adults and subadults with no grave goods and those with one or more grave goods was significant ($X^2=5.5951$, df = 1, $p<0.025$), but when the group of subadults was not included and only males and females were compared the distribution was not found to be statistically significant at the .05 level ($X^2=0.2203$, df=1, $p<1$).

There were eight (27.6%) older adults, eight (27.6%) middle adults, and four (13.8%) younger adults buried with grave goods, with six infants (20.7%) and three children (10.3%) also buried with grave goods. The burial sample comprised 13.8% (n=4) older females, 10.3% (n=3) middle adult females, and 6.9% (n=2) younger adult
females. Males buried with grave goods include 13.8% (n=4) older males, 17.2% (n=5) middle adult males, and 6.9% (n=2) young adult males.

Overall, older adult individuals tended to have grave goods, but older females seemed to have grave goods more consistently (Appendix I). Older males (n=4) and females (n=4) could not be compared using chi-square analysis due to the small sample sizes. Even when middle and older age groupings were combined, males (n=9) and females (n=7) were not found to be significantly different at the .05 level ($X^2=1.8636$, df = 1, p<0.20).

All but two of the sites from Manuelito Plateau had more burials without grave goods than with grave goods. Sites with more burials without grave goods could be seen as the typical distribution within the Manuelito Plateau sample (Figure 5.27). The sites that did not exhibit this pattern had an even split of burials with and without grave goods.

Grave goods were broken down into four categories; jewelry, lithics, ceramics, and organics (bark, bone, and cedar poles). Table 5.16 summarizes the occurrence of these grave goods within the burial sample from Manuelito Plateau. Not unexpectedly 48 ceramic grave goods were found with 22 individuals from the sites (45.8%). There were only 90 grave good items found at the six sites, with ceramics making up the majority of items, 53.3% (n=48/90 total grave goods) (Figure 5.28). Twenty-four lithics were found with eight burials (26.7%), ten pieces of organic material were found with eight burials (11.1%), and eight pieces of jewelry were found with six burials (8.9%); this included 38 stone beads from a necklace (counted as 1 necklace) and a pair of turquoise earrings. This pattern was likely due to the preservation of ceramic and lithic items over organic materials.
Burial Positioning

Burial positioning includes the orientation of the head, body position and leg position upon interment. Table 5.17 summarizes the findings based on age and sex categories. To allow for a more consistent discussion of the results the categories of north, south, east, and west were collapsed to include orientation such as north-by-northeast.

The most common orientation of head among adults was to the north (23%, n=12). Figure 5.29 illustrates that males were more often placed with their heads oriented to the north (36.4%, n=8), than females (19.1%, n=4). Adults were more often oriented to the north (23%, n=12) than subadults (8.5%, n=4) (Figure 5.30). Subadults were most commonly oriented to the south (10.6%, n=5), and only one child (6.7%) was oriented to the west. There seemed to be more variation in terms of head orientation when different the different age categories were examined.

Fifty percent of adult males were placed on the right side (n=11), and 23.8% of females were placed on the right side (23.8%, n=5) or on the back (23.8%, n=5) (Figure 5.31). Children were placed on the left side most often (13.3%, n=2), but due to such small numbers of observations this was not a certain conclusion (Figure 5.32). Subadult body positioning was mostly indeterminate due to incomplete recovery.

Leg positioning was most often in the tightly flexed position. Males were found in this arrangement 50% (n=11) of the time, but females were more prone to be found in a semiflexed (14.4%, n=3) position (Figure 5.33). Subadults were usually found in either,
Table 5.14. The Occurrence of Grave Good Items by Site.

<table>
<thead>
<tr>
<th>Item</th>
<th>LA31240 n=20</th>
<th>LA31247 n=37</th>
<th>LA31249 n=8</th>
<th>LA31277 n=18</th>
<th>LA31284 n=14</th>
<th>LA121585 n=2</th>
<th>Totals n=99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bead</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>5.1%</td>
</tr>
<tr>
<td>Pendant</td>
<td>1</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>Earrings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Necklaces</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total no. of burials with jewelry</strong></td>
<td>2</td>
<td>10%</td>
<td>1</td>
<td>2.7%</td>
<td>1</td>
<td>12.5%</td>
<td>0%</td>
</tr>
<tr>
<td>Mineral</td>
<td>1</td>
<td>5%</td>
<td>2</td>
<td>5.4%</td>
<td></td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>Pigment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>5.6%</td>
<td>1%</td>
</tr>
<tr>
<td>Mako</td>
<td>3</td>
<td>15%</td>
<td>1</td>
<td>2.7%</td>
<td></td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>Axe</td>
<td>3</td>
<td>15%</td>
<td>1</td>
<td>2.7%</td>
<td></td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>Worked stone</td>
<td>2</td>
<td>10%</td>
<td>1</td>
<td>2.7%</td>
<td></td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>Sandstone</td>
<td>1</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Projectile point</td>
<td>1</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>Lithic tool/Biface</td>
<td>5</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.1%</td>
</tr>
<tr>
<td>Crystal</td>
<td>1</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total no. of burials with lithics</strong></td>
<td>4</td>
<td>20%</td>
<td>2</td>
<td>5.4%</td>
<td>0</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Sherd</td>
<td>5</td>
<td>25%</td>
<td>1</td>
<td>2.7%</td>
<td>1</td>
<td>12.5%</td>
<td>7%</td>
</tr>
<tr>
<td>Worked sherd</td>
<td>1</td>
<td>2.7%</td>
<td></td>
<td></td>
<td>1</td>
<td>7.1%</td>
<td>2%</td>
</tr>
<tr>
<td>Jar</td>
<td>4</td>
<td>20%</td>
<td>3</td>
<td>8.1%</td>
<td>1</td>
<td>12.5%</td>
<td>12%</td>
</tr>
<tr>
<td>Bowl</td>
<td>3</td>
<td>15%</td>
<td>6</td>
<td>16.2%</td>
<td>2</td>
<td>11.1%</td>
<td>19%</td>
</tr>
<tr>
<td>Pitcher</td>
<td></td>
<td></td>
<td>1</td>
<td>7.1%</td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>Mug/cup</td>
<td></td>
<td></td>
<td>1</td>
<td>7.1%</td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>Dipper/scoop</td>
<td></td>
<td></td>
<td>1</td>
<td>7.1%</td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>Duck Effigy</td>
<td></td>
<td></td>
<td>2</td>
<td>14.3%</td>
<td></td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td><strong>Total no. of burials with ceramics</strong></td>
<td>4</td>
<td>20%</td>
<td>6</td>
<td>16.2%</td>
<td>2</td>
<td>25%</td>
<td>4%</td>
</tr>
<tr>
<td>Awl</td>
<td>2</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>Scraper</td>
<td>2</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>Worked Faunal bone</td>
<td>1</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>Cedar bows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>7.1%</td>
<td>3%</td>
</tr>
<tr>
<td>Bark</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total no. of burials with organics</strong></td>
<td>3</td>
<td>15%</td>
<td>1</td>
<td>2.7%</td>
<td>0</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Burials with grave goods</td>
<td>8</td>
<td>40%</td>
<td>9</td>
<td>24.3%</td>
<td>3</td>
<td>37.5%</td>
<td>7%</td>
</tr>
<tr>
<td>Burials without grave goods</td>
<td>12</td>
<td>60%</td>
<td>28</td>
<td>75.7%</td>
<td>5</td>
<td>62.5%</td>
<td>7%</td>
</tr>
</tbody>
</table>

1 = this site was pot hunted multiple times with a focus upon burial disturbance.
2 = 38 stone beads found around the neck.
3 = 2 turquoise pieces with holes drilled in them found on either side of the cranium.
Table 5.15. Cross-tabulation of the Number of Grave Goods with Age.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1-2</th>
<th>3-4</th>
<th>5+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Percent</td>
<td>26.1</td>
<td>25</td>
<td>44.4</td>
<td>66.7</td>
<td>30.9</td>
</tr>
<tr>
<td>Females</td>
<td>4</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Percent</td>
<td>17.4</td>
<td>45</td>
<td>22.2</td>
<td>33.3</td>
<td>29.1</td>
</tr>
<tr>
<td>Subadults</td>
<td>13</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>Percent</td>
<td>56.5</td>
<td>30</td>
<td>33.3</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>20</td>
<td>9</td>
<td>3</td>
<td>55</td>
</tr>
<tr>
<td>Percent</td>
<td>41.8</td>
<td>36.4</td>
<td>16.4</td>
<td>5.5</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 5.27. Proportion of Burials with and without Grave Goods.

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Figure 5.28. Proportion of Grave Goods Types at Manuelito Plateau.

Table 5.16. Summary of Grave Good Frequencies.

<table>
<thead>
<tr>
<th>Burial Good Type</th>
<th>Count</th>
<th>Percentage of Sample ( n=99 )</th>
<th>Number of Burials with Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jewelry</td>
<td>8</td>
<td>8.1%</td>
<td>6</td>
</tr>
<tr>
<td>Lithics</td>
<td>24</td>
<td>24.2%</td>
<td>8</td>
</tr>
<tr>
<td>Ceramics</td>
<td>48</td>
<td>48.5%</td>
<td>22</td>
</tr>
<tr>
<td>Organics</td>
<td>10</td>
<td>10.1%</td>
<td>8</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>90</strong></td>
<td><strong>90.8%</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>
Figure 5.29. Proportion of Male and Female Manuelito Plateau Burials Head Orientation.

Figure 5.30. Proportion of Adults and Subadult Manuelito Plateau Burial Head Orientation.
Table 5.17. Summary of the Burial Positions from the Manuelito Plateau Sites.

<table>
<thead>
<tr>
<th>Age &amp; Sex</th>
<th>North</th>
<th>South</th>
<th>East</th>
<th>West</th>
<th>Indet.</th>
<th>R Side</th>
<th>L Side</th>
<th>Back</th>
<th>Indet.</th>
<th>Flexed</th>
<th>Semi Flexed</th>
<th>Tightly Flexed</th>
<th>Indet.</th>
</tr>
</thead>
</table>
| Adult Males | 36.4%  
(n=22) | 9.1%  
(n=8) | 4.5%  
(n=1) | 13.6%  
(n=3) | 36.4%  
(n=8) | 50%  
(n=11) | 13.6%  
(n=3) | 18.2%  
(n=4) | 18.2%  
(n=4) | 13.6%  
(n=3) | 13.6%  
(n=3) | 50%  
(n=11) | 22.7%  
(n=5) |
| Adult Females | 19.1%  
(n=4) | 9.5%  
(n=2) | 9.5%  
(n=2) | 0%  
(n=13) | 61.9%  
(n=5) | 23.8%  
(n=5) | 14.3%  
(n=3) | 23.8%  
(n=5) | 38.1%  
(n=8) | 9.5%  
(n=2) | 14.3%  
(n=3) | 9.5%  
(n=2) | 66.7%  
(n=14) |
| Adults | 0%  
(n=9) | 0%  
(n=9) | 0%  
(n=9) | 0%  
(n=9) | 100%  
(n=9) | 0%  
(n=9) | 0%  
(n=9) | 0%  
(n=9) | 100%  
(n=9) | 0%  
(n=9) | 0%  
(n=9) | 0%  
(n=9) | 100%  
(n=9) |
| Total Adults | 23%  
(n=52) | 7.7%  
(n=12) | 5.8%  
(n=4) | 5.8%  
(n=3) | 57.7%  
(n=30) | 30.8%  
(n=16) | 11.5%  
(n=6) | 17.3%  
(n=9) | 40.4%  
(n=21) | 9.6%  
(n=5) | 11.5%  
(n=6) | 25%  
(n=13) | 53.9%  
(n=28) |
| Children | 13.3%  
(n=15) | 13.3%  
(n=2) | 0%  
(n=2) | 6.7%  
(n=10) | 66.7%  
(n=1) | 6.7%  
(n=1) | 13.3%  
(n=2) | 13.3%  
(n=2) | 73.3%  
(n=11) | 13.3%  
(n=2) | 13.3%  
(n=2) | 0%  
(n=6) | 73.3%  
(n=11) |
| Infants | 6.9%  
(n=29) | 6.9%  
(n=2) | 6.9%  
(n=2) | 0%  
(n=23) | 79%  
(n=1) | 3.4%  
(n=1) | 0%  
(n=1) | 0%  
(n=1) | 93.2%  
(n=27) | 0%  
(n=6) | 3.4%  
(n=1) | 0%  
(n=6) | 96.6%  
(n=28) |
| Fetal | 0%  
(n=3) | 33.3%  
(n=2) | 0%  
(n=2) | 0%  
(n=2) | 0%  
(n=2) | 66.7%  
(n=3) | 0%  
(n=3) | 0%  
(n=3) | 0%  
(n=3) | 33.3%  
(n=1) | 0%  
(n=3) | 66.7%  
(n=2) |
| Total Subadults | 8.5%  
(n=47) | 10.6%  
(n=5) | 4.3%  
(n=2) | 2.1%  
(n=1) | 74.5%  
(n=35) | 4.3%  
(n=2) | 4.3%  
(n=2) | 4.3%  
(n=2) | 87.1%  
(n=41) | 6.5%  
(n=3) | 4.3%  
(n=2) | 2.1%  
(n=1) | 87.1%  
(n=41) |
| Totals | 16.2%  
(n=99) | 9.1%  
(n=16) | 5%  
(n=9) | 4%  
(n=5) | 65.7%  
(n=65) | 18.2%  
(n=18) | 8.1%  
(n=8) | 11.1%  
(n=11) | 62.6%  
(n=62) | 8.1%  
(n=8) | 8.1%  
(n=8) | 14.1%  
(n=14) | 69.7%  
(n=69) |

Indet. = Indeterminate
Figure 5.31. Proportion of Male and Female Manuelito Plateau Burial Body Position.

Figure 5.32. Proportion of Adult and Subadult Manuelito Plateau Burial Body Position.
Figure 5.33. Proportion of Male and Female Manuelito Plateau Burial Leg Positioning.

Figure 5.34. Proportion of Adult and Subadult Manuelito Plateau Burial Leg Positioning.
flexed (6.5%, n=3), or semiflexed (4.3%, n=2) positions with no clear pattern evident (Figure 5.34). Though the most common body positioning was indeterminate in all categories, adults and subadults were clearly oriented differently. Adults were oriented to the north, placed on the right side, with the legs in the semiflexed or flexed position. Subadults were oriented to the south, in no clear body position, but in a flexed leg position.

For those individuals buried without grave goods, 8.8% (n=6) were buried with their head oriented to the north (Table 5.18). This included males, females and subadults. The right side was the most frequent body position with 8.8% (n=6), and tightly flexed leg positioning (5.9%, n=4) was the most common position among those buried without grave goods. Subadults had a variety of positions and no clear pattern could be established. Males buried without grave goods, followed the general pattern exhibited with the head oriented to the north, the body on the right side, and the legs tightly flexed. Females buried without grave goods also followed this general pattern with their heads oriented to the north, body on the right side, but with the legs semiflexed.

Burials with grave goods exhibited similar patterns with a few differences (Table 5.19). Males were buried with the head-facing north (45.5%, n=5), the body on the right side (63.6%, n=7), and the legs tightly flexed (72.7%, n=8). Females buried with grave goods continued to be buried with the head oriented to the north (27.3%, n=3), but they were placed on the back more frequently (36.4%, n=4) than on the right side (27.3%, n=3). Those females buried with grave goods had no distinctive leg position. Potentially this could be due to incomplete inhumations, or methods of excavation. Subadults buried
Table 5.18. Summary of the Adult Burial Positions without Grave Goods from the Manuelito Plateau Sites.

<table>
<thead>
<tr>
<th>Sex</th>
<th>North</th>
<th>South</th>
<th>East</th>
<th>West</th>
<th>Indet.</th>
<th>Right Side</th>
<th>Left Side</th>
<th>Back</th>
<th>Indet.</th>
<th>Flexed</th>
<th>Semi Flexed</th>
<th>Tightly Flexed</th>
<th>Indet.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>27.3%</td>
<td>9.1%</td>
<td>0%</td>
<td>9.1%</td>
<td>0%</td>
<td>9.1%</td>
<td>36.4%</td>
<td>9.1%</td>
<td>18.2%</td>
<td>36.4%</td>
<td>9.1%</td>
<td>18.2%</td>
<td>45.5%</td>
</tr>
<tr>
<td>(n=11)</td>
<td>(n=3)</td>
<td>(n=1)</td>
<td></td>
<td>(n=1)</td>
<td>(n=6)</td>
<td>(n=1)</td>
<td>(n=2)</td>
<td>(n=4)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=2)</td>
<td></td>
<td>(n=5)</td>
</tr>
<tr>
<td>Females</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>90%</td>
<td>20%</td>
<td>10%</td>
<td>10%</td>
<td>60%</td>
<td>0%</td>
<td>10%</td>
<td>0%</td>
<td>90%</td>
</tr>
<tr>
<td>(n=10)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td></td>
<td>(n=1)</td>
<td>(n=2)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=2)</td>
<td>(n=6)</td>
<td>(n=1)</td>
<td>(n=2)</td>
<td></td>
<td>(n=9)</td>
</tr>
<tr>
<td>Subadults</td>
<td>4.3%</td>
<td>4.3%</td>
<td>0%</td>
<td>2.1%</td>
<td>89.4%</td>
<td>0%</td>
<td>2.1%</td>
<td>2.1%</td>
<td>95.7%</td>
<td>2.1%</td>
<td>2.1%</td>
<td>2.1%</td>
<td>93.6%</td>
</tr>
<tr>
<td>(n=47)</td>
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<td>(n=2)</td>
<td></td>
<td>(n=1)</td>
<td>(n=42)</td>
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<td>(n=45)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td></td>
<td>(n=44)</td>
</tr>
<tr>
<td>Totals</td>
<td>8.8%</td>
<td>4.4%</td>
<td>0%</td>
<td>2.9%</td>
<td>83.8%</td>
<td>8.8%</td>
<td>4.4%</td>
<td>5.9%</td>
<td>80.9%</td>
<td>2.9%</td>
<td>5.9%</td>
<td>5.9%</td>
<td>85.3%</td>
</tr>
<tr>
<td>(n=68)</td>
<td>(n=6)</td>
<td>(n=3)</td>
<td></td>
<td>(n=2)</td>
<td>(n=57)</td>
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<td>(n=4)</td>
<td></td>
<td>(n=58)</td>
</tr>
</tbody>
</table>

Indet. = Indeterminate

Table 5.19. Summary of the Adult Burial Positions with Grave Goods from the Manuelito Plateau Sites.

<table>
<thead>
<tr>
<th>Sex</th>
<th>North</th>
<th>South</th>
<th>East</th>
<th>West</th>
<th>Indet.</th>
<th>Right Side</th>
<th>Left Side</th>
<th>Back</th>
<th>Indet.</th>
<th>Flexed</th>
<th>Semi Flexed</th>
<th>Tightly Flexed</th>
<th>Indet.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>45.5%</td>
<td>9.1%</td>
<td>9.1%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>63.6%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>0%</td>
<td>18.2%</td>
<td>9.1%</td>
<td>72.7%</td>
<td>0%</td>
</tr>
<tr>
<td>(n=11)</td>
<td>(n=5)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=7)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=1)</td>
<td></td>
<td>(n=8)</td>
</tr>
<tr>
<td>Females</td>
<td>27.3%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>0%</td>
<td>36.4%</td>
<td>27.3%</td>
<td>18.2%</td>
<td>36.4%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>45.5%</td>
</tr>
<tr>
<td>(n=11)</td>
<td>(n=3)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td></td>
<td>(n=4)</td>
<td>(n=3)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td>(n=4)</td>
<td>(n=2)</td>
<td>(n=2)</td>
<td></td>
<td>(n=4)</td>
</tr>
<tr>
<td>Subadults</td>
<td>22.2%</td>
<td>33.3%</td>
<td>22.2%</td>
<td>0%</td>
<td>22.2%</td>
<td>11.1%</td>
<td>11.1%</td>
<td>22.2%</td>
<td>55.6%</td>
<td>22.2%</td>
<td>11.1%</td>
<td>0%</td>
<td>66.7%</td>
</tr>
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<td>(n=9)</td>
<td>(n=2)</td>
<td>(n=3)</td>
<td>(n=2)</td>
<td></td>
<td>(n=2)</td>
<td>(n=1)</td>
<td>(n=1)</td>
<td>(n=2)</td>
<td>(n=5)</td>
<td>(n=2)</td>
<td>(n=1)</td>
<td></td>
<td>(n=6)</td>
</tr>
<tr>
<td>Totals</td>
<td>32.3%</td>
<td>19.4%</td>
<td>16.1%</td>
<td>6.5%</td>
<td>25.8%</td>
<td>35.5%</td>
<td>16.1%</td>
<td>25.8%</td>
<td>22.6%</td>
<td>19.4%</td>
<td>16.1%</td>
<td>32.3%</td>
<td>35.5%</td>
</tr>
<tr>
<td>(n=31)</td>
<td>(n=10)</td>
<td>(n=6)</td>
<td>(n=5)</td>
<td>(n=2)</td>
<td>(n=8)</td>
<td>(n=11)</td>
<td>(n=5)</td>
<td>(n=7)</td>
<td>(n=6)</td>
<td>(n=4)</td>
<td>(n=10)</td>
<td></td>
<td>(n=11)</td>
</tr>
</tbody>
</table>

Indet. - Indeterminate
with grave goods were more often buried with the head oriented to the south (33.3% n=3), the body placed on the back (22.2%, n=2), and the legs in a flexed position (22.2%, n=2). The similarity of the body position of females and subadults could indicate a closer relationship between these two groups than with males in the Manuelito Plateau sample.

Though the mortuary data contained small values, chi-square analysis was attempted on the data that had more than zero values. This eliminated testing subadults and adults by head orientation, and females with and without grave goods based on head orientation. However, males buried with grave goods and oriented to the north (n=5), and not oriented to the north (n=4), were tested with males buried without grave goods and oriented to the north (n=3), and not to the north (n=2). The Fisher Exact two-sided test resulted in a p-value of 0.762 that suggested there was 76% probability that the difference between males buried with and without grave goods and oriented to the north or not, was due to chance.

Adults with grave goods and oriented north (n=8), and not north (n=8), were tested with adults buried without grave goods and oriented north (n=4), and not north (n=2). The Fisher Exact two-sided test resulted in a p-value of 0.646 that indicated that there was a 64.4% probability that the differences between adults buried with or without grave goods and oriented to the north or not, was due to chance.

Males buried on their right side with grave goods (n=7), and those buried without grave goods (n=4), were tested with females buried on the right side with grave goods (n=3), and without grave goods (n=2). The Fisher Exact two-sided test resulted in a p-
value of 0.654 that suggested that there was a 65.4% probability that the differences between males and females buried on their right side, with or without grave goods, was due to chance.

When males buried with the legs in a flexed position (including semi and tightly flexed) with grave goods (n=11), and without grave goods (n=6), were tested with females buried with the legs in a flexed position (including semi and tightly flexed) with grave goods (n=6), and without grave goods (n=1), the Fisher Exact two-sided test resulted in a p-value of 0.625. This result indicates that there was a 62.5% probability that the differences between males and females buried with their legs in the flexed position, with or without grave goods, was due to chance and was not statistically significant. Possibly with larger sample sizes for burial positioning, the patterns, hinted to by the frequency results, could be demonstrated using statistical analysis as well.

**Burial Location**

The location of the burial includes the variables of physical location within the site, the grave type, and the type of burial. Tables 5.20 through 5.22 summarize the findings from the Manuelito Plateau sites.

The overall trends in burial location included the placement within midden fill (87.9% n=87), interment in earthen pits (59.6% n=59), and as primary burials (47.5% n=47). Since these overall trends were obvious within the data it was not surprising that they were mimicked by the age groupings, and those associated with and without grave goods, with only slight variation. The slight differences observed included subadults buried in feature fill (12.8% n=6) more often than adults (7.7% n=4), and secondary burial types were more prevalent among subadults (6.4% n=3) than adults (3.8%
Table 5.20. The Summary of the Burial Types from Manuelito Plateau.

<table>
<thead>
<tr>
<th>Age &amp; Sex</th>
<th>Associated Feature Type</th>
<th>Grave Type</th>
<th>Burial Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Midden</td>
<td>Feature Fill</td>
<td>Extramural Feature</td>
</tr>
<tr>
<td>Adult Males</td>
<td>90.9% (n=20)</td>
<td>9.1% (n=2)</td>
<td>0%</td>
</tr>
<tr>
<td>(n=22)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Females</td>
<td>85.7% (n=18)</td>
<td>9.5% (n=2)</td>
<td>4.8% (n=1)</td>
</tr>
<tr>
<td>(n=21)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults Indet.</td>
<td>100% (n=9)</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>(n=9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Adults</td>
<td>90.4% (n=47)</td>
<td>7.7% (n=4)</td>
<td>1.9% (n=1)</td>
</tr>
<tr>
<td>(n=52)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td>73.3% (n=11)</td>
<td>26.7% (n=4)</td>
<td>0%</td>
</tr>
<tr>
<td>(n=15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infants</td>
<td>89.7% (n=26)</td>
<td>6.9% (n=2)</td>
<td>0%</td>
</tr>
<tr>
<td>(n=29)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal</td>
<td>100% (n=3)</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>(n=3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Subadults</td>
<td>85% (n=40)</td>
<td>12.8% (n=6)</td>
<td>0%</td>
</tr>
<tr>
<td>(n=47)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>87.9% (n=87)</td>
<td>10.1% (n=10)</td>
<td>1%</td>
</tr>
<tr>
<td>(n=99)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indet. - Indeterminate
Table 5.21. The Summary of the Adult Burial Types with Associated Grave Goods from Manuelito Plateau.

<table>
<thead>
<tr>
<th>Associated Feature Type</th>
<th>Grave Type</th>
<th>Burial Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Midden</td>
<td>Pitstr. Fill</td>
</tr>
<tr>
<td>Male (n=11)</td>
<td>90.9%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Female (n=11)</td>
<td>72.7%</td>
<td>18.2%</td>
</tr>
<tr>
<td>Indet. (n=9)</td>
<td>88.9%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Totals (n=31)</td>
<td>83.9%</td>
<td>12.9%</td>
</tr>
</tbody>
</table>

Unk = Unknown

Table 5.22. Summary of Adult Burial Types without Grave Goods from Manuelito Plateau.

<table>
<thead>
<tr>
<th>Associated Feature Type</th>
<th>Grave Type</th>
<th>Burial Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Midden</td>
<td>Feature Fill</td>
</tr>
<tr>
<td>Male (n=11)</td>
<td>90.9%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Female (n=10)</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Indet. (n=47)</td>
<td>87.3%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Totals (n=68)</td>
<td>89.7%</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

Unk = Unknown
Two females, one male and one child (12.9% n=4) were buried within earthen pits excavated into pitstructure fill as primary internments (Table 5.21). Grave goods accompanied both of these burials. Burials without grave goods were not found in any of the pitstructure features. One male (9.1%) was buried within the fill of an architectural feature without grave goods (Table 5.22), and one adult female was buried within an extramural feature (4.8%) with grave goods. This burial was interred right next to a large pitstructure found at site LA121585. Since this pattern was not evident among any of the other categories, this may have represented a unique situation.

At the Duckfoot site near Mesa Verde Colorado three males, two females and two subadults were buried within pitstructure features (Hoffman 1993: 265). The skeletal remains were deliberately covered with modified and unmodified stone and placed on the floor of the structures, which also had floor contact artifacts including ceramic vessels. Apparently, this pattern was not uncommon among Ancestral Puebloan groups.

**Burials within Feature Context**

Three sites (LA12185, LA31249, and LA31240) had eight burials that were not interred within the midden. Two were older adult females, three were children, two were middle adult males, and one was a middle adult female.

Seven of the burials were primary with five buried within pit structures and one buried within a pit right next to a pit structure. One child was a secondary burial within a room of a pueblo. There were a variety of body positions and orientations of the cranium within the eight burials. The most common pattern was interment on the right side (n=5) and the head oriented north (n=3). Two of the children were buried in different positions when compared to the adults; a pattern exhibited by the general population as well. One
child was buried on the left side and another was buried seated with legs flexed to the right. One of the males was buried face down (supine) but with legs flexed to the right, and the middle adult female was buried on her back (prone) with the legs semi-flexed to the right. All of the burials were placed in a flexed position with one female and one male tightly flexed.

Grave goods were not found with all of the burials interred within feature context. Five of the eight individuals had grave goods and three did not have associated grave goods. One of the individuals without grave goods was a child buried in the seated position and another was the male placed in the supine position.

Females were buried with a variety of objects, but mostly ceramic vessels. From site LA31240 an older adult female (Burial 113) was buried with a complete corrugated jar, and a middle adult female from the same site was buried with two basalt axes, one possible argulite pendant pre-form and a worked ulna bone from a large to medium sized mammal. The older adult female burial (101) from site LA121585 had cedar wood poles above and under the remains and sandstone slabs that lined the grave pit. Grave goods included one Puerco Black-on-white bowl broken into two pieces and placed on either side of the body, one large Escavada Black-on-white bowl, ground red pigment, one shell disc bead and two pieces of turquoise found on either side of the head that likely represent earrings.

One male from site LA31240 was buried with grave goods and within a pit structure feature. There was a large sandstone slab placed over the feet and several lithic tools including one basalt axe with two grooves, one sandstone mano with groove, one sandstone mano, one Washington pass chert bird point, one jasper midsection biface, one
utilized clear chalcedony flake, and one large mammal worked bone spatula. This older adult individual (45-55 years of age) was also the tallest individual in the sample.

A child 5 to 7 years of age from site LA31240 was also buried within a pitstructure with associated grave goods. These included one Puerco Black-on-white bowl, one Cibola gray ware corrugated jar, six Showlow Black-on-red bowl sherds that refit, and four unidentified Black-on-white sherds grouped together within the grave pit.

Of all of the individuals buried within feature contexts the adult burials were in remarkably good condition with 85% or more of the skeleton complete. This allowed for complete observations and measurements of these individuals. The average female stature was 152.5 cm and the average male stature estimate was 165.5 cm with one individual estimated to have been 174 cm or 5 foot 8 inches. The female stature was not different from the overall female sample and the male stature was slightly higher. When the male stature was compared to the rest of the region, the estimates were most similar to the Chacoan Small Sites (164.7 cm). The female statures compared most favorably with the Black Mesa late period sites (152.5 cm), and Black Mesa NAPGPRRA Sites (151.8 cm). Overall, the males buried within features were taller than the regional average and the females were shorter than the regional average.

Only healed incidences of porotic hyperostosis were observed in two females. Four individuals exhibited no evidence of the disease and one individual was unobservable. One child (4-6 years of age) buried within the roomblock of site LA31249 had both active porotic hyperostosis and active and healed expression of cribra orbitalia. The two other children (ages 4-6 and 5-7 years) had no disease expression. Cribrar cranii was not observed in any of the individuals buried in feature contexts, and only two
incidences of healed cribra orbitalia were observed in one adult male and one child. None of the females buried within feature contexts had evidence of porotic hyperostosis, cribra cranii, or cribra orbitalia.

Females also do not have any dental caries, but two of the females had one abscess each. Both of the males had more than three caries each and multiple abscesses. As with the rest of the Manuelito Plateau sample none of the children had evidence of dental disease.

Additional health indicators for those individuals buried within feature contexts included five burials with evidence of fractures. Four of these individuals had healed fractures of the cranium, rib, and toe. All of the females buried within feature context had evidence of healed fractures. The child buried within feature context had a perimortem fracture of the left parietal and occipital. Interestingly enough this individual was also one of four secondary burials from the Manuelito Plateau.

Two individuals, one adult female (35 to 45 years of age) and one adult male (40 to 50 years of age), from LA31240 had the only incidences within the Manuelito Plateau sample of multiple small button osteomas on the cranial vault. These benign osteoblastic tumors occur primarily on the outer surface of the cranium in older individuals (Ortner and Putschar 1981: 378), and are more common in males than females (Aufderheide and Rodriguez-Martin 1998).

A female from LA31240 had a large well-developed carcinoma on the right distal tibia and fibula. This boney carcinoma was likely a secondary chondrosarcoma similar to the one pictured in Ortner and Putschar (1981: 373). The tibia was so encased by the boney proliferation of the carcinoma that the fibula had been displaced dorsally. This
type of chondrosarcoma develops from the residual retention of the cartilage cap of the metaphysis of the tibia (Ortner and Puschar 1981), and likely caused long term suffering and was crippling to this individual. Even though this middle adult female had an advanced bone carcinoma of the tibia and fibula that likely caused her death, she was buried within a pit structure and with grave goods.

Summary

From the six archaeological sites investigated, 99 individuals were identified. There were 52 adults and 47 subadults. Of the adults 22 were male (42.3%), 21 female (40.4%), and nine adults that could not be estimated for biological sex (17.3%). General demographics were similar to other regional Ancestral Puebloan samples.

This was also true of the stature results. The mean male measurement was 162.74 cm and the mean female measurement was 152.64 cm. The overall mean stature for the 36 measured individuals was 157.69 cm. The females buried with grave goods had a mean stature of 152.75 cm and the females buried without grave goods were 152.42 cm. Those males buried with grave goods had an overall mean stature estimate of 164.98 cm and the males buried without grave goods were much taller with a mean stature of 159.94. The differences in stature estimates between those buried with grave goods and those without grave goods were not statistically significant; yet, the frequency data suggests that both males and females buried without grave goods may have been slightly more nutritionally stressed than the males and females buried with grave goods. This could also have been a product of small sample size and should be further investigated.
The incidence of active and healed or active expression of cribra orbitalia, cribra cranii, and porotic hyperostosis was more prevalent in subadults with only a few adults exhibiting active or healed and active expressions. This was supported by a statistically significant result between age and cribra orbitalia. The results suggested that there was an age relation to the development of at least cribra orbitalia among the Manuelito Plateau sample. Since this disease was probably related to nutritional stress it is not uncommon for subadults to exhibit more bony reactions than adults due to their greater nutritional needs for normal growth.

Boney reactions related to porotic hyperostosis were more prevalent among males buried with grave goods with both active and healed or healed expressions. Males buried without grave goods exhibited healed incidences of porotic hyperostosis. Males from Manuelito Plateau did not exhibit active or active and healed bone responses related to cribra orbitalia. Males with grave goods had a low occurrence of healed bone, and a high incidence of no bone reaction related to cribra orbitalia. Males without grave goods had a low occurrence of healed bone and there were few individuals with no disease expression. None of the females had active or healed and active expressions of porotic hyperostosis from Manuelito Plateau and females with grave goods had a higher incidence of healed bone expression.

The incidence of cribra cranii within the Manuelito Plateau sample was much lower than either porotic hyperostosis or cribra orbitalia. This was likely because observations for this disease expression were difficult to obtain in the field setting.

The overall dental health pattern of all of the individuals from the six Manuelito Plateau sites indicated that there were more abscesses than caries, and that adult males
had more dental pathology, and a greater number of observable teeth than females, indeterminate adults, and subadults. Caries or dental abscesses were not found in any of the subadults burials examined.

The dental pattern for individuals buried with grave goods indicated that females have more dental caries and abscesses. The overall dental health pattern exhibited by the individuals buried without grave goods indicates that males had more dental caries, abscesses, and observable teeth than females or subadults buried without grave goods. This difference could be related to the greater number of teeth preserved in males than females resulting in more pathological observations. Though not statistically significant, these results suggested that an age differentiation might have existed among the Manuelito Plateau sample in terms of access to subsistence resources. With increased age, the dental health of the sample decreases with adults exhibiting dental pathologies more often than those individuals less than 20 years of age. Females buried with grave goods had poorer dental health than males buried with grave goods. Conversely, males had poorer dental health than females when they were not buried with grave goods.

Of the 52 discrete burials from the Manuelito Plateau sample, 29 were buried with associated grave goods. Twenty-three of these individuals were buried without grave goods. Nine of the burials with grave goods were female, 11 were male, and nine were subadults. All but two of the sites from Manuelito Plateau had more burials without grave goods than with grave goods. This pattern probably indicates a typical distribution within this sample population. The sites that did not exhibit this pattern had an even split of burials with and without grave goods. It was not surprising that ceramics were found with
the majority of individuals from the sites. Lithics, organic material, and jewelry were found in decreasing amounts among those burials with grave goods.

Adult and subadult burials were placed differently within Manuelito Plateau burials. Adults were oriented to the north, positioned on the right side, with the legs in semiflexed or flexed position. Subadults were oriented to the south, in no clearly preferred body position, but in a flexed leg position.

The overall trends in burial location included placement within midden fill, internment in earthen pits, and as primary burials. Of the eight individuals buried within feature context, from three of the sites from Manuelito Plateau, there were more females than males, but also as many children. These individuals were primary internments with one secondary child burial. All of the burials that could be observed were placed in a flexed position and the majority of individuals were oriented to the north. Five of the eight burials had grave goods and three did not have associated goods. Though the grave goods found in association with the burials from feature contexts ranged from a single item to elaborate grave treatment and numerous grave goods, they were not the only graves with this type of special treatment. The adult males and subadults found interred within the midden had numerous grave goods including unique items. Three of the midden graves had additional grave treatments; all of these individuals were males over 40 years of age. Infants and children interred within the midden were also buried with a variety of grave goods such as ceramics (including two child burials with duck effigy vessels), beads, lithics, and animal bone tools. Females buried within midden contexts were not interred with as numerous or elaborate grave goods as those buried within features.
The fact that there were three females and only one male buried with grave goods within feature locations suggests that middle and older adult females may have been treated differently than the rest of the females within the Manuelito Plateau sample. This may imply that differential burial treatment was practiced at two of the Manuelito Plateau sites (LA121585 and LA31240). These three females were greater than 35 years of age, found in the flexed position, had healed porotic hyperostosis, no dental caries, and one dental abscess in two of the females, and evidence of healed fractures in all three of them. This pattern suggests that if a female from Manuelito Plateau could survive through general health stress, and trauma to reach an age greater than 35 years, then she would likely be interred within discrete features and with grave goods.

Overall, those individuals buried within feature contexts were distinct from the rest of the sample in terms of general health patterns. The females were healthier in terms of nutritional stress. Only healed instances of porotic hyperostosis were observed, and no dental caries and only two abscesses were present. Males exhibited more dental disease than the females, but maintained their stature when compared to the rest of the sample and the Ancestral Puebloan region in general. This perhaps indicated that males had greater access to food resources such as protein that encouraged bone growth, as well as sticky carbohydrate foods such as maize, which resulted in poor dental health.
DISCUSSION AND CONCLUSIONS

Using mortuary and osteological evidence the hypothesis that social hierarchies based on sex and age existed during the Pueblo II and Pueblo III (A.D. 900-1300) period on the Manuelito Plateau, New Mexico was tested. The validity of the hypothesis was examined using population demographics, health indicators, grave goods, burial position, and burial context within the six research sites.

It was expected that this research would show that females greater than 35 years of age would be represented by a larger number of grave goods and would exhibit better overall health than the rest of the sample. In turn, these older females would be buried in distinct features such as pit structures or roomblocks as opposed to midden deposits. Though this particular mortuary pattern has not been established in previous archaeological research for this area, indications from archaeologists working in other areas such as Black Mesa (Spur 1993), Mesa Verde (Hoffman 1993), and Chaco Canyon (Akins 1986) have noted that older females may have received differential burial treatment. But, was this pattern present in the Manuelito Plateau region? The findings from this research, suggest that some older females buried with more grave goods and in feature context may indicate the presence of differential mortuary treatment. This pattern may have been present at two of the six sites from Manuelito Plateau. Because the sample
size was small, this mortuary pattern could not be substantiated with statistical analysis. However, with additional research further evidence to support the presence of this pattern among Pueblo II and Pueblo III Ancestral Puebloan groups in the Southwestern United States may be found.

At the Manuelito Plateau sites, adults older than 35 years were more often buried with grave goods than were adults younger than 35 years of age. Adults were more often buried with grave goods than subadults. This was supported statistically with a significant difference ($X^2 = 5.5951$, df=1, $p<0.025$) between adults and subadults found without grave goods and those individuals buried with one or more grave goods.

Once the sex of the individuals was considered, differences in mortuary treatment became evident. Though not statistically significant, more males than females older than 35 years of age were found buried with grave goods. However, when males and females greater than 45 years of age (older adults) were considered, there was an even split between the sexes. These burials were placed in flexed positions usually on the right side and were oriented to the north more frequently than the other cardinal directions.

A difference between burials found with grave goods was evident when the location of the internment was considered. At two of the sites, LA121585 and LA31240, three females older than 35 years were buried with grave goods and within feature contexts. However, at site LA31240 only one male (40-50 years) and one child (5-7 years of age) were buried within feature contexts. These small numbers suggest a possible pattern of mortuary differentiation that could not be established statistically. The presence
of a child distinguish through mortuary treatment is intriguing and lends credence to the possibility that there may have been ascribed status within the social organization of the Ancestral Puebloan population from Manuelito Plateau.

Of further interest was the health of the older adult females buried with grave goods, and within feature contexts. Evidence such as healed expressions of porotic hyperostosis and cribra orbitalia, and lack of cribra cranii was not found to be statistically different from other females buried with or without grave goods. There was also no statistical difference when dental pathology was compared. Since females buried within midden contexts were not found to be statistically taller than those females buried within feature or midden contexts and with grave goods, this suggests preferential mortuary treatment was not correlated with increased nutritional fitness among the females from Manuelito Plateau. This discrepancy is further supported by the statistically significant differences between the Manuelito Plateau females and the females from Chaco canyon (t=2.632, df=17, p=0.0175) that support the theory that females from Chaco were taller due to better nutrition. Stature estimates should not be considered without mentioning that some of the differences observed in stature comparisons could be explained by the age of the females and the affect of osteoporosis. However, this too could be an indication of nutritional stress that became emphasized with age.

The greatest difference between females buried within feature contexts and with grave goods, and the rest of the females from Manuelito Plateau, was the presence of healed skeletal fractures. Of the five females from four of the six sites that exhibited
evidence of healed fractures (3 cranial and 2 terminal foot phalanges), all were older than 35 years of age and all were buried with grave goods. Three of these females were also buried within feature contexts.

This interesting association between fractures, older adult females, grave goods and burial location may suggest that the individual who suffered in life may have been honored in death. Because these females had survived nutritional stress and trauma as evident from healed porotic hyperostosis, cribra orbitalia, and lesions, they may have earned the right to special treatment as compared to the rest of the female sample from Manuelito Plateau.

Though there may not be indications of social hierarchy at all of the sites from Manuelito Plateau there appears to be a suggestion of differential burial treatment based on age, sex, and possibly health at two of the research sites (LA121585 and LA31240). According to Tainter, (1975; 1977; 1980; 1981) a mortuary system with highly organized social structure would be hierarchical and represent a complex society, while less organized social structure and simple mortuary systems would be indicative of egalitarian societies. When Tainter’s mortuary theory is applied, it appears the pattern of burial within feature contexts, with the accompaniment of grave goods would be indicative of a more hierarchical social structure at some of the Manuelito Plateau sites. Though Adler (1996) is personally not convinced that there is social hierarchy within and between Puebloan groups, Fred Plog suggests that there is, “… internal economic interdependence and probable social hierarchy” (Adler 1996:4). Thus for two of the Manuelito Plateau sites social hierarchy was indicated by the midden vs. feature burial differences.
This pattern was further supported when considering the Kayenta sample from Black Mesa. Researchers observed a possible pattern of older adult women buried with ceramic vessels that was attributed to possible, “… high status of women based on matrilocal residence leading to more blood relatives present to give offerings, or it may be that older women simply made or used ceramic vessels” (Hays-Gilpin 1993:170). Ward (1975) mentioned a similar pattern at Inscription House, which was also located in the Kayenta region. He noted that the most numerous and diverse grave goods were associated with adult women and consisted of utilitarian items such as manos, metates, ceramic vessels, and bone tools (Ward 1975:29-34). The Black Mesa samples during the Pueblo time periods do not show an increase of porotic hyperostosis over time, but the number of individuals affected and the severity does increase over time and was prevalent in the late Pueblo group (Martin et al. 1991:221). Children were more at risk than adults this suggests that stress was present, but that they survived into adulthood.

Estimates of stature for the Black Mesa group was relatively high compared to those found at other Mesoamerican and Southwest sites (Martin et al. 1991:91), and were consistent for both males and females.

In the Mesa Verde region there was no clear pattern of age or sex linked mortuary treatment (Stodder 1986), except at those sites with Great Houses, or Chacoan influence. Sites such as Dominguez Ruin and Aztec Ruin had individuals buried with many associated artifacts including elaborate pendants, turquoise, jet, and shell beads. It was suggested by researchers (Lipe et al. 1999:259) that the late Pueblo II period experienced social differentiation and hierarchy not seen either earlier or later in the Pueblo tradition within the Mesa Verde region.
Mesa Verde health patterns suggested a change in health from late Pueblo II to Pueblo III time periods. Stodder (1984) sees this change in health in a decreasing stature height of females and an increase in cribra orbitalia in subadults. The increase in maternal and infant mortality resulted in a diminished potential for population growth and suggested an overall decline in fitness of the Mesa Verde Sample (Stodder 1984:455). This health change was attributed to increased labor required for food production and wild procurement during the climatically unstable 13th century that eventually lead to the abandonment of the region (Stodder 1984:455).

When Chaco small sites were compared to the Great Houses, important insight into the social organization of this Ancestral Puebloan group was gained (Akins 2001). During the Gallup period (A.D. 1030-1150, Pueblo II/III) and McElmo period (A.D. 1100-1175, Early Pueblo III) males were found buried within structures more often than females and adults only slightly more often than subadults (Akins 2001). During this time, older females were buried with mats, and feather cloths, but males were more likely to have vessels than females. Turquoise was also found associated with females, which follows the pattern that adults were more likely to have ornaments than children were. In addition, those burials found in structures were more likely to have ornaments than those individuals buried in middens. Burial practices for small sites of the Gallup and McElmo periods remained variable with no characteristics that suggested differentiation among individuals based on age or sex (Akins 2001:174 and 175).

Chacoan Great House sites have the lowest reported incidences of porotic hyperostosis when compared to the small sites. The life table from Pueblo Bonito suggests that this group had a relatively high mean age of death, higher than other
populations reported from the Southwest (Martin et al. 1995: Table 3.181; Stodder 1989:176). Since stature is one of the more sensitive indicators of nutritional status (Nelson et al. 1994:97), it is also perhaps the best indication of better health and evidence for differential access to resources. At Pueblo Bonito, both the males and females from the northern rooms were the tallest reported for Southwestern populations (Stodder 1989:184-185). The Pueblo Bonito sample may have enjoyed relatively favorable status allowing greater access to resources (Nelson et al. 1994:90).

During the Mesa Verde period (A.D. 1175-1300, Late Pueblo III), at Chaco, there were no Great House burials, but at Aztec Ruin, a Great House site to the north near the Animas River, there were substantial burials that contained significant amounts of grave goods that implied differential mortuary treatment (Akins 2001: 175). In summary, Akins (2001) suggests that the adults buried at the small sites from Chaco canyon were buried with vessels more often and had more vessels than subadults, which suggested a system of age ranking (Akins 2001: 177). The sheer quantity of grave goods found with burials at Great House sites further supported this conclusion and indicated greater access to these materials, which suggested higher, probable status within the society (Akins 2001:178).

Howell (2001) analyzed ancestral Zuni burials from the Pueblo IV (A.D. 1325-1680) site from Hawikku. Evidence from these burials suggests that grave goods and special grave and body preparation represented community leaders. These leaders were thought to hold multiple positions of responsibility and political power. Three of the four burials found to be affiliated with these higher social positions were adult females. The females were oriented to the southeast and placed in an extended supine position. The
females were buried with corn, squash, manos, metates, decorated ceramics, utility ceramics and paint grinding stones (Howell 2001:152). Elaborate grave preparation included matting placed under the head and lining the grave pit, lining graves with bark or the presence of a rattlesnake shrine in one of the burials indicated differential burial treatment (Howell 2001:152). Additional female leaders were identified and attributed to heads of matrilineal lines or some equivalent role based on the domestic items found with these burials (Howell 2001:159). Items such as shaped wooden objects, feathers, human hair, paint grinding stones, antler, bark and gourds were attributed to ritual activity. These graves goods suggested that females held leadership roles concerned with ritual or religion (Howell 2001:159).

When the health of the identified leaders was considered for the Hawikku site, it was found that the Zuni leaders had less evidence of porotic hyperostosis than the rest of the population (Howell 2001:163). Though this difference was not statistically significantly, the stature comparisons were found to be very divergent. The female leaders were found to be taller than the rest of the female population. The males did not show obvious differences when stature estimates were compared. Howell (2001) attributes the height of the females to genetic kinship links, but this height difference could also be similar to the one exhibited at Chaco indicating that these females were less nutritionally stressed than the rest of the female Ancestral Zuni population.

Inequality based on heredity, or ascribed status is usually associated with complex societies. Mortuary data is influenced by social organization and therefore key to recognizing the presence of status. According to Wason, (1994:67-68) mortuary ritual will usually under-represent the degree and complexity of status hierarchy. Variables that
indicate differential burial treatment incorporate observations within the archaeological record that include the treatment of the body, the content of the grave, biological dimensions including age, sex, health, disease, circumstances of death, and genetic relationships (Wason 1994:67-68). When high status individuals were also consistently found to be healthier and more robust than the rest of the population, this provides supportive data of a hereditary based status (Wason 1994:71, 73-74). Status differences can be inferred from the quantity of grave goods and the variation of materials found in association with burials. However, the range of variation and complexity of the assemblage in terms of artifact types, quality of workmanship, material types and sources, and whether these are utilitarian or nonutilitarian have proven to be greater indicators of status (Wason 1994:93-95). Males in complex societies would be more apt to hold positions of power and prestige through achievement, whereas females would be included more often if status was hereditary (Wason 1994). Therefore, if equal proportions of males and females were represented by high status burials and infants and children were included, then this would suggest that heredity was important. While predominance of adult males, generally in their prime, indicates hereditary factors were less important. When some children appear to have higher status than most adults then status must be acquired by something other than personal achievement (Wason 1994:98-100). Major differences in burial practices would not be found unless there were substantial status differences in the society (Wason 1994:7).

At the Manuelito Plateau sites, only subtle status differences were observed through the archaeological record, not the obvious evidence Wason (1994) presents that is indicative of obvious formal social stratification. Although, according to Wason
(1994), mortuary ritual usually under-represents the degree and complexity of status hierarchy, the evidence from the Manuelito Plateau sites seems to indicate the potential presence of status. The treatment of the bodies at LA31240 and LA121585, with the inclusion of grave goods not common with other burials found at the sites, “weathered” older (35+ years) females interred within features instead of midden context strongly suggest that differential mortuary treatment was present during the Pueblo II and Pueblo III (A.D. 900-1300) period on the Manuelito Plateau. This is further supported by the inclusion of not only utilitarian grave goods, but also unique items such as jewelry, crystals, pigment, cedar bows, and a bark-lined grave.

Wason (1994: 71, 73-74) declares that greater quantity and variation of materials indicates greater status. When this concept is applied to the evidence from Manuelito Plateau this seems to be the case for at least two of the Manuelito Plateau sites. The lack of differential health among those individuals treated differently through mortuary practices suggests that differential access to nutritional based resources was not part of the status hierarchy at the Manuelito Plateau sites. In fact, the individuals who attained possible higher status, indicated by feature burials and grave goods seem to have indications of more age related health stress than those not buried in feature context.

Although the Manuelito Plateau sample was not large, it provided unique research possibilities to test small site social organization beyond the influential cultural centers of the Ancestral Puebloan culture. The definition of population can be confidently applied to this group of individuals due to the fact that the sites were completely investigated, were located within a mile of one another, and the sites represent the same time period. Unlike most archaeological investigations within the Ancestral Puebloan region, that span great
distances, represent multiple time periods, were incompletely investigated due to project restrictions and therefore had few or no burials recovered, the Manuelito Plateau sites represented a distinctive opportunity for interpretation.

The location of the sites within an area that has not been extensively studied and situated between four distinct subcultures within the Ancestral Puebloan region leads to the question of which cultural subgroup is represented by the Manuelito Plateau sample. The patterns presented by the comparison of regional archaeology suggest the type of cultural influences in the project area. The lack of Chacoan architecture and the presence of burial patterns similar to the Kayenta and Puerco River area indicate greater interaction with these areas, as opposed to Chaco Canyon or Mesa Verde. Furthermore, the similarity of the artifact assemblage to the Puerco River and Kayenta regions adds to the evidence that these subcultures may have had greater influence on the Manuelito Plateau sites.

When burial practices were compared between Mesa Verde, Chaco, Kayenta and the Puerco River or Cibola regions the most similar patterns were again found between Manuelito Plateau and the Kayenta and Puerco River areas. The similar mortuary traits included primary burials commonly found within middens, without grave goods, individuals placed on their back with legs flexed, and no obvious preference for head orientation. This mortuary pattern suggested some form of close contact or affiliation with these regions.

More research is needed to determine if differential mortuary treatment for age and sex was present within the greater Southwest. For instance, within the Pueblo II and III periods the Puerco River region has not been investigated with this particular research
question in mind. Collections such as Houck (Wade 1970), and the Coronado Project (Hartman 1986) would need to be reexamined. The small sites from the Dolores Archaeological Project could also shed some light on whether or not this pattern existed in this region as well. A comparison between the Dolores sites and the large Mesa Verde sites could provide useful information about the presence of social stratification within this region during the Pueblo II and Pueblo III periods. Again, this would require a reexamination of the skeletal remains and archaeological records to establish mortuary patterns, with approval from affiliated cultural groups. This would lead to a greater understanding of regional social organization within the prehistoric Southwest.

Through the examination of bioarchaeological data, significant insight was achieved concerning Ancestral Puebloan social organization at Manuelito Plateau during the Pueblo II to Pueblo III (A.D. 900-1300) time periods. The possibility of social stratification could be evident at two of the sites examined. Some of the adult females who had reached the age of 35 or more years at death were buried within architectural features and with a greater variety of grave goods. This suggests that there may have been differential mortuary treatment. Although these people were treated differently in death, they did not exhibit a healthier life style when stature, dental pathologies, and iron deficiency were examined. This suggests that status hierarchies were not necessarily tied to the control of subsistence resources at the Manuelito Plateau sites.

From this research, a greater understanding of prehistoric groups within the Southwestern United States was gained. Though there is room for further research concerning the question of age and sex related social differences within the regional Ancestral Puebloan culture, the potential of identifying this pattern within other
subcultures affiliated with the Ancestral Puebloan groups is very likely due to the mounting evidence. This study can also be used to outline the minimal recording strategies needed by bioarchaeologists working with mortuary excavation in the Southwest or during NAGPRA repatriation efforts at institutions.
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Wise, Karen

### Burials with Grave Goods.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Burial No.</th>
<th>Sex</th>
<th>Age</th>
<th>Grave Type</th>
<th>Additional Grave Treatment</th>
<th>Grave Good Items</th>
</tr>
</thead>
</table>
| LA31240 | 103        | Male  | Middle Adult | Earthen Pit | Sandstone slab placed under lower legs and feet | 1 untyped large Black-on-White sherd near the feet  
28 sherd from one plain gray ware corrugated jar - Cibolan  
1 shaped sandstone slab underneath the lower legs and feet  
1 medium sized tan fine grained sandstone ‘prayer stick’ tapered and highly polished  
1 small brown-orange mudstone ‘prayer stick’  
1 mottled tan chert biface 8 cm long under right heal  
1 gray chalcedony agate knife blade  
1 gray-banded base and midsection of a side-notched dart point  
1 small quartz crystal  
1 small piece of possible yellow pigment - probably limonite mineral  
2 bone awls from large mammals in 4 fragments |
|         | 104        | Female | Young Adult | Earthen Pit? | None                         | 1 complete shell bead biconically drilled  |
|         | 107        | Female? | Young Adult | Earthen Pit? | None                         | 1 sandstone mano in 2 pieces  |
|         | 113        | Female | Older Adult | Earthen Pit | None                         | 1 complete corrugated jar - unidentified  
1 basalt axe with 2 grooves  
1 sandstone mano with groove  
1 sandstone mano  
1 Washington pass chert bird point  
1 jasper midsection biface  
1 utilized clear chalcedony flake  
1 worked bone spatula from a large mammal  
1 large Black-on-white bowl - Reserve  
1 corrugated plain jar  |
|         | 114        | Male   | Middle Adult | Earthen Pit | Sandstone slab placed over the feet | 1 large Black-on-white bowl - Reserve  
1 corrugated plain jar  
1 Black-on-white bowl - Puerco  
1 gray ware plain corrugated jar - Cibola  
6 sherds Black-on-red from a bowl - Showlow  
4 Black-on-white sherds grouped together - unidentified  |
|         | 115        | Female | Young Adult | Earthen Pit? | None                         | 1 corrugated plain jar  |
|         | 118        | Indeterminate | Child | Earthen Pit | None                         | 1 Black-on-white bowl - Puerco  
1 gray ware plain corrugated jar - Cibola  
6 sherds Black-on-red from a bowl - Showlow  
4 Black-on-white sherds grouped together - unidentified  |
<table>
<thead>
<tr>
<th>Site No.</th>
<th>Burial No.</th>
<th>Sex</th>
<th>Age</th>
<th>Grave Type</th>
<th>Additional Grave Treatment</th>
<th>Grave Good Items</th>
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</thead>
<tbody>
<tr>
<td>LA31240</td>
<td>120</td>
<td>Female</td>
<td>Middle</td>
<td>Earthen Pit</td>
<td>None</td>
<td>2 basalt axes 1 possible argillite pendant perform 1 worked ulna from a large to medium sized animal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adult</td>
<td></td>
<td></td>
<td>1 indented corrugated gray ware bowl Tusayan 1 sandstone uniface mano 1 square stone bead</td>
</tr>
<tr>
<td>LA31247</td>
<td>101</td>
<td>Indeterm.</td>
<td>Infant</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 nearly complete Black-on-white bowl in 8 pieces - unidentified</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 large plain ware sherd worked into a platter - unidentified 1 large corrugated bowl capped 1 plain ware capping sherd for bowl - unidentified</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bark lining the pit</td>
<td>1 corrugated jar placed inside bowl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Older</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 hemispherical plain gray ware bowl 1 bullet shaped ground stone in 2 pieces that refit 1 rounded but flattened mineral or pigment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adult</td>
<td></td>
<td></td>
<td>1 ground with indentations mineral or pigment 1 incomplete indented corrugated shallow bowl in 24 pieces - unidentified 1 small corrugated jar - unidentified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Middle</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 Black-on-white jar – Gallup 1 Black-on-white bowl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adult</td>
<td></td>
<td></td>
<td>1 small shallow flat bottomed plain gray ware cup/vessel with broken handle – unidentified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>Adolescent</td>
<td>Unknown</td>
<td>None</td>
<td>1 worked scapula scraping tool – Odocoileus sp. (deer)</td>
</tr>
<tr>
<td>LA31249</td>
<td>103</td>
<td>Male</td>
<td>Older</td>
<td>Earthen Pit</td>
<td>None</td>
<td>2 complete Olivella spiral lopped beads</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adult</td>
<td></td>
<td></td>
<td>1 large corrugated sherd</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>Middle</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 plain ware dipper with rod handle in 3 pieces 1 incomplete plain corrugated jar in 5 pieces</td>
</tr>
<tr>
<td></td>
<td>105</td>
<td>Indeterm.</td>
<td>Infant</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 hemispherical plain gray ware bowl</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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</table>

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<table>
<thead>
<tr>
<th>Site No.</th>
<th>Burial No.</th>
<th>Sex</th>
<th>Age</th>
<th>Grave Type</th>
<th>Additional Grave Treatment</th>
<th>Grave Good Items</th>
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<tbody>
<tr>
<td>LA31277</td>
<td>9</td>
<td>Female</td>
<td>Older Adult</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 festooned corrugated jar</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Male</td>
<td>Young Adult</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 small Black-on-white jar with indented handles – Puerco</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 indented corrugated bowl with a broken rim</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Black-on-white jar base capped the corrugated bowl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Red pigment stain on skeleton</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Black-on-white jar – Gallup</td>
</tr>
<tr>
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<td>12</td>
<td>Female</td>
<td>Older Adult</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 large mammal long bone awl</td>
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<td></td>
<td>1 small indented corrugated bowl – unidentified</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Black-on-white scoop – Red Mesa</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 black-on white duck effigy – Escavada</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 worked large mammal bone with a snap and ground edge</td>
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<td></td>
<td></td>
<td></td>
<td>1 incomplete Black-on-white bowl in 4 pieces – Escavada</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 large mammal ulna bone awl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 indented corrugated bowl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 white ware plain bowl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 Black-on-white mug – Puerco</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 black-on-red bowl – Showlow</td>
</tr>
<tr>
<td></td>
<td>104</td>
<td>Indeterm.</td>
<td>Child</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 Black-on-white scoop – Escavada</td>
</tr>
<tr>
<td></td>
<td>105</td>
<td>Male</td>
<td>Middle Adult</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 indented corrugated sherd that the scoop was placed on – unidentified</td>
</tr>
<tr>
<td></td>
<td>108</td>
<td>Male</td>
<td>Older Adult</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 small plain ware pinch pot from around the head</td>
</tr>
<tr>
<td></td>
<td>109</td>
<td>Indeterm.</td>
<td>Infant</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 Black-on-white duck effigy – Escavada</td>
</tr>
<tr>
<td></td>
<td>111</td>
<td>Indeterm.</td>
<td>Child</td>
<td>Earthen Pit</td>
<td>None</td>
<td>1 small plain ware pinch pot pitcher – unidentified</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38 gray soapstone disk beads from around the neck (necklace)</td>
</tr>
<tr>
<td></td>
<td>101</td>
<td>Female</td>
<td>Older Adult</td>
<td>Earthen Pit</td>
<td>Cedar wood poles above and under sandstone slab and lining the grave pit</td>
<td>1 Black-on-white bowl in 2 pieces – Puerco</td>
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<td>1 large Black-on-white bowl – Escavada</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 ground red pigment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 turquoise pieces found on either side of the cranium (earrings)</td>
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<td></td>
<td></td>
<td>1 shell disc bead</td>
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<tr>
<td>Site No.</td>
<td>Site Date</td>
<td>Temporal Designation</td>
<td>Burial No.</td>
<td>Sex</td>
<td>Age</td>
<td>Beg Age Range</td>
</tr>
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<tr>
<td>LA31240</td>
<td>A.D. 900-1300</td>
<td>Pueblo II-III</td>
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<td>Indeterminate</td>
<td>Child</td>
<td>3 yrs</td>
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<tr>
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<td></td>
<td></td>
<td>102</td>
<td>Male</td>
<td>Middle Adult</td>
<td>40 yrs</td>
</tr>
<tr>
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<td></td>
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<td>103</td>
<td>Male</td>
<td>Middle Adult</td>
<td>40 yrs</td>
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<td>104</td>
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<td>Young Adult</td>
<td>25 yrs</td>
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<td>Indeterminate</td>
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<td>Indeterminate</td>
<td>Child</td>
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<td></td>
<td></td>
<td>107</td>
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<td>Young Adult</td>
<td>20 yrs</td>
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<tr>
<td></td>
<td></td>
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<td>108</td>
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<td>Child</td>
<td>4.5 yrs</td>
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<td>Indeterminate</td>
<td>Child</td>
<td>3 yrs</td>
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<td>111</td>
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<td></td>
<td>113</td>
<td>Female</td>
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<td>45 yrs</td>
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<td>114</td>
<td>Male</td>
<td>Middle Adult</td>
<td>40 yrs</td>
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<td>115</td>
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<td>Young Adult</td>
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<td>116</td>
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<td>120</td>
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<table>
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<tr>
<th>Site No.</th>
<th>Site Date</th>
<th>Temporal Designation</th>
<th>Burial No.</th>
<th>Sex</th>
<th>Age</th>
<th>Beg Age Range</th>
<th>End Age Range</th>
<th>Completeness</th>
<th>Stature (cm)</th>
<th>Grave Goods</th>
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<td>LA31247</td>
<td>A.D. 950-1250</td>
<td>Pueblo II-III</td>
<td>101</td>
<td>Indeterminate</td>
<td>Infant</td>
<td>2 yrs</td>
<td>2.5 yrs</td>
<td>30%</td>
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<td>Yes</td>
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<td></td>
<td>102</td>
<td>Male</td>
<td>Older Adult</td>
<td>45 yrs</td>
<td>55 yrs</td>
<td>99%</td>
<td>166.00</td>
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<td></td>
<td></td>
<td></td>
<td>103</td>
<td>Indeterminate</td>
<td>Fetal</td>
<td>9.5 lunar</td>
<td>10 lunar</td>
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<td>40 yrs</td>
<td>50 yrs</td>
<td>75%</td>
<td>161.00</td>
<td>No</td>
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<td>Male</td>
<td>Young Adult</td>
<td>30 yrs</td>
<td>35 yrs</td>
<td>50%</td>
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<td>2.5 yrs</td>
<td>11%</td>
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<td>Yes</td>
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<td>Infant</td>
<td>2 yrs</td>
<td>3 yrs</td>
<td>35%</td>
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<td>No</td>
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<tr>
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<td>108</td>
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<td>45 yrs</td>
<td>55 yrs</td>
<td>98%</td>
<td>172.50</td>
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<td>Burial No.</td>
<td>Sex</td>
<td>Age</td>
<td>Beg Age Range</td>
<td>End Age Range</td>
<td>Completeness</td>
<td>Stature (cm)</td>
<td>Grave Goods</td>
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</tr>
<tr>
<td>109</td>
<td></td>
<td></td>
<td></td>
<td>Male</td>
<td>Older Adult</td>
<td>45 yrs</td>
<td>55 yrs</td>
<td>99%</td>
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LA31247  A.D. 950-1250  Pueblo II-III

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<td>2.5 yrs</td>
<td>35%</td>
<td>Indeterminate</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indeterminate</td>
<td>Child</td>
<td>4 yrs</td>
<td>5 yrs</td>
<td>85%</td>
<td>Indeterminate</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indeterminate</td>
<td>Infant</td>
<td>Birth</td>
<td>2 yrs</td>
<td>5%</td>
<td>Indeterminate</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indeterminate</td>
<td>Fetal</td>
<td>8 lunar mo.</td>
<td>9 lunar mo.</td>
<td>1%</td>
<td>Indeterminate</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indeterminate</td>
<td>Infant</td>
<td>Birth</td>
<td>2 yrs</td>
<td>1%</td>
<td>Indeterminate</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>LA121585</td>
<td>A.D. 1000-1150</td>
<td></td>
<td>Female</td>
<td>Older Adult</td>
<td>50 yrs</td>
<td>60 yrs</td>
<td>99%</td>
<td>155.00</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Late Pueblo II</td>
<td></td>
<td>Indeterminate</td>
<td>Child</td>
<td>4 yrs</td>
<td>6 yrs</td>
<td>35%</td>
<td>Indeterminate</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

? = Probable male/probable female
VITA

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Underwood, Sali A. and Susan Thomas
1996 Inventory Report of Archaeological Collections held by the Anasazi Heritage Center that are impacted by the Native American Graves Protection and Repatriation Act (NAGPRA). In-house publication, Bureau of Land Management, Anasazi Heritage Center, Dolores, Colorado.

Thesis Title: Ancestral Puebloan Social Hierarchies at Manuelito Plateau, New Mexico

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