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When examining Native American/Euroamerican interactions from the 17th through the 19th centuries often the focus is on the impact that Euroamerican technologies, institutions, diseases, and individuals had on indigenous systems. Frequently this research measures these impacts in the corresponding level of cultural change. Recent work has begun to re-examine the idea of cultural change, envisioning the process as multi-faceted with cultural change and continuity being inextricable intertwined. In an effort to re-evaluate contact era events and processes in the High Plains and Rocky Mountain regions of the West an investigation of indigenous religious and subsistence practices during the Late Prehistoric, Protohistoric, and Early Historic periods was conducted. This work focused on examining the impact that Euroamerican goods had on Native American cultural systems prior to the movement of large amounts of Euroamericans into the region. To accomplish this regional Native American burial practices and bison hunting, butchery, and transport strategies at the Vore Site were analyzed. The results found that while variation in the material assemblages in the form of Euroamerican goods was present, indigenous religious and subsistence practices showed a general continuity through time from the Late Prehistoric into the Early Historic period.

RE-EXAMINING CONTACT ON THE HIGH PLAINS AND ROCKY MOUNTAIN REGIONS OF THE WEST

By
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TABLE OF CONTENTS

Acknowledgments iii

Table of Contents v

List of Figures viii

List of Tables x

Chapter 1: Examining the Impact of Euroamerican Goods on Native American Burial Practices 1

Introduction 1

Native American/Euroamerican Contact 2

Issues Related to Modern Contact Studies 9

Analysis Based on the Past 9

The Need for Diachronic Studies 10

Issues Relating to Continuity and Change 11

Examining Continuity and Change in Mortuary Contexts 13

Mortuary Contexts on the High Plains and Rocky Mountains 15

The Research Question 16

Methods 19

Dating 21

Artifacts 23

The use of Comparative Datasets 31

Results 32

Bead Plots 33

Elemental Analysis and Dating Brackets 38

The Burials 40

Late Prehistoric Regional Burial Trends 55

Protohistoric and Historic Tribal Burial Forms 56

Discussion and Conclusions 59

Analysis of the Study Sample 60

Materials and Meanings 66

Native Adaptability and Cultural Continuity 67

A Re-assessment of Native Burial Practices and Belief Systems 68

Native Communities and Issues of Continuity and Change 69

Works Cited 72

Chapter 2: Examining Butchering and Transport Practices at the Vore Site during the Late Prehistoric, Protohistoric, and Early Historic Periods 90

Introduction 90

The Vore Site 94

Finding the Protohistoric 99

Human Produced Cutmarks as a Proxy Measure 101

The Research Question 104

Methodology: Cutmark Identification and Site Data Analysis 107

Results 117

Discussion 121

Late Prehistoric/Protohistoric Bison Hunting and Processing 129

The Vore Data Analysis 134

Bison Hunting and Processing at the Vore Site 140

Implications and Insights 146

Cultural Identity and the Integration of New Items and Technologies 149

Implications for the Vore Assemblage 150

Conclusion 151

Works Cited 154

Chapter 3: Re-Examining Continuity and Change in Native Cultural Systems on the High Plains and Rocky Mountain Regions of the West during the Protohistoric and Historic Periods 168

Introduction 168

A Brief History of Cultural Contact Studies 169

Reassessing Native Change 173

Change in Native Systems 175

Native Group Identification in the Prehistoric and Historic Periods 177

Discussion 179

Burials 180

Subsistence 182

Re-analyzing the Fur Trade and the Introduction of the Horse 183

A Re-Analysis of Contact on the High Plains and in the Rocky Mountains 194

Conclusion 202

Works Cited 205

Appendix A: Associated Funerary Objects 214

LIST OF FIGURES

Figure 1.1: General locations of burials included in this study 21

Figure 1.2: Plot of bead minimum and maximum diameters by burial 28

Figure 1.3: Plot of bead sphericity and maximum thickness by burial 29

Figure 1.4: Subplot #1 of bead minimum and maximum diameters by burial 34

Figure 1.5: Subplot #2 of bead minimum and maximum diameters by burial 35

Figure 1.6: Subplot #1 of bead sphericity and maximum thickness by burial 36

Figure 1.7: Subplot #2 of bead sphericity and maximum thickness by burial 37

Figure 1.8: Burial dating brackets 38

Figure 1.9: Percentage of native and Euroamerican artifact types 54

Figure 2.1: Overhead of the Vore sinkhole and excavation units 96

Figure 2.2: Planview of Vore excavation units 97

Figure 2.3: Basic morphologies of metal and stone modifications 109

Figure 2.4: Magnified image of a cutmark with striations 109

Figure 2.5: Magnified image of a cutmark barb 110

Figure 2.6: Distribution of stone cutmarks on analyzed Vore femora 122

Figure 2.7: Distribution of metal cutmarks on analyzed Vore femora 122

Figure 2.8: Distribution of stone cutmarks on analyzed Vore humeri 123

Figure 2.9: Distribution of metal cutmarks on analyzed Vore humeri 123

Figure 2.10: Distribution of chopmarks on analyzed Vore humeri 124

Figure 2.11: Distribution of metal cutmarks on analyzed Vore metacarpals 124

Figure 2.12: Distribution of stone cutmarks on analyzed Vore scapula 125

Figure 2.13: Distribution of metal cutmarks on analyzed Vore scapula 125

Figure 2.14: Distribution of stone cutmarks on analyzed Vore mandibles 126

Figure 2.15: Distribution of metal cutmarks on analyzed Vore mandibles 126

LIST OF TABLES

Table 1.1: Burials 20

Table 1.2: Burial Attributes 22

Table 1.3: Associated Bead Measurements 26

Table 1.4: Relationship between White Bead Ocifiers and Date Brackets 29

Table 1.5: Relationship between Turquoise Elemental Breakdowns and Date Brackets 31

Table 1.6: Interment Type in Chronological Order 39

Table 2.1: Recorded Attributes and their Meaning 112

Table 2.2: Vore Level Data 113

Table 2.3: Elements and Associated Counts 115

Table 2.4: Elements and Associated Defleshing Data 120

Table 2.5: Elements and Associated Marrow Processing Data 120

Table 2.6: Cutmarks by Type, Element, and Level 127

Table 2.7: Cutmark Frequencies, Instances, and Marrow Processing 128

Table 2.8: Vore Lithic Data 136

Table 2.9: Vore MNI Data 138

Table 2.10: MNI Counts by Element and Level 138

CHAPTER 1

EXAMINING THE IMPACT OF EUROAMERICAN GOODS ON NATIVE AMERICAN BURIAL PRACTICES

During the 15th century European nations began to expand their reach around the globe as they explored, exploited, and settled new lands in a quest for territorial expansion, resources, economic gain, and power; putting them in contact with native populations inhabiting these regions. These encounters were part of global, cross cultural processes which influenced economic, political, and demographic systems of indigenous and European societies (Algaze 1993a, 1993b; Champion 1989; Dyson 1985; Lyons and Papadopoulos 2002; Rowlands, Larsen, and Kristiansen 1987).

Alfred Crosby referred to the processes associated with European expansion, colonization, and conquest as the Columbian Exchange. He found that the development of global transportation networks combined with the interaction of diverse populations led to the introduction of people, plants, animals, and diseases to new populations around the world (Crosby 1972, 1986, 1994). These agents are believed to have had a transformative effect on the societies, cultures, political organization, biologies, technologies, and physical landscapes of indigenous groups and Europeans alike (Hutchinson and Norr 2006:375; Larsen 2000:8-9; Larsen et al. 2001: 69; Mrozowski 2006:23; Silliman 2004: 274-275). For this reason the contact period is considered by many to be a formative moment in the histories of Euroamerican and

indigenous populations which provided the foundation for modern global political and economic systems (Mann 2011: 6-7; Raudzens 1999:x, 157; Sokolow 2003:2-10).

Due to this, countless archaeologists, anthropologists, and historians investigated these events and processes from a number of different theoretical perspectives. This work revealed a wide range of variability in the nature and implications of contact across space and through time. This paper will synthesize historic, anthropological, and archaeological data with current research in an effort to add to the discourse examining the nature and implications of culture contact between Euroamericans and native groups on the High Plains and in the Central Rocky Mountain regions of North America. This study will build on previous work (Bamforth 1987; Becker 2010; Frison 1967; Reher 1978; Reher 1988; Reher and Frison 1980; Sutton 2004) examining social, political, and economic changes during the Protohistoric period. Changes that came as a result of environmental shifts and migrations have been examined. What has seen less investigation is the impact that the introduction of Euroamerican goods had on extant indigenous cultural systems. This study seeks to address this through a discussion on the manner in which Euroamerican manufactured goods were used, valued, and understood by native groups and an examination of the manner in which these items were integrated into native systems and in doing so acted as agents of larger cultural change or were manipulated as a means of reinforcing traditional cultural values. This will be done through an investigation of continuity and/or changes in indigenous burial practices on the High Plains and in the Central Rocky Mountain regions of the West from the Late Prehistoric through the Historic periods.

NATIVE AMERICAN/EUROAMERICAN CONTACT

Variability in Euroamerican/Native American contact processes is due at least in part to the range of activities engaged in by both Euroamerican and indigenous populations. These activities included trade, colonization, missionization, enslavement, and conflict. These Euroamerican/Native American interactions could, and often would, change through time and it was not uncommon for more than one of these activities to characterize a given place at a given time.

Trade, ranging from small personalized exchanges to expansive fur trade networks, was often the earliest form of native/Euroamerican contact (Silliman 2004:282). This activity introduced the gun, the horse, and other Euroamerican goods into native systems. Settlement activity allowed for the establishment of governmental control of an area and aided in the production and extraction of valuable resources. Settlement also transformed native landscapes, co-opted native lands, put indigenous people under colonial governmental regulation and placed them in direct sustained contact with Euroamerican people, ideas, technologies, and diseases. Missionary activity sought to reorganize native settlement, subsistence, cultural and/or ideological practices, and had a transformative effect on indigenous health, social organization, and worldviews. The intensity and timing of missionary activity varied widely. Alongside settlement and missionization were processes of enslavement whereby Euroamerican groups would extract labor from indigenous populations. In some regions slavery was institutionalized while in others it was less frequent. Native/Euroamerican conflict varied widely, ranging from brief localized engagements to full blown military actions leading to a wide range of impacts on indigenous lifeways. Some conflicts fit within existing native worldviews while others such as

large scale warfare could have seen the eradication of entire cultural groups or such population loss that existing social, cultural, political, and religious practices were no longer sustainable.

These contact processes were driven by underlying Euroamerican expansion activities. Lyons and Papadopoulos (2002:14) find two underlying causes for Euroamerican expansion, territorial expansion and resource exploitation. On the High Plains and in the Rocky Mountain regions of North America both of these processes were at play. While the region was variably claimed by the Spanish, French, and eventually the United States, colonization and settlement were not primary concerns of these nations prior to the middle of the 19th century. Rather the region was exploited for its resources, mainly fur bearing animals such as the beaver and bison.

The exploitation of fur bearing animals manifested itself in the integration of Native American tribes into the Euroamerican fur trade. This process led to the introduction of Euroamerican manufactured goods into the High Plains and Rocky Mountain regions well in advance of Euroamericans themselves. The movement of these Euroamerican goods, including the horse, the gun, and metal tools has been used to mark the beginning of the Protohistoric period. A period defined by Ray (1978:26) "as the transitional period between the initial receipt of European goods by the aboriginal inhabitants of a region which signals the end of the prehistoric, and the arrival of Europeans in the area which marks the beginning of the historic period". The introduction of Euroamerican manufactured items, and thus the beginning of the Protohistoric period, is believed to have begun sometime between 1650 and 1700 (Kornfeld et al. 2010:137; Miller 2012:5; Scheiber and Finley 2012:350).

The first direct Native American/Euroamerican contact in the West likely came with French or Spanish expeditionary endeavors in the 18th century (Barbour 2000:7; La Vérendrye 1927; Weber 1992:171). However, direct, sustained contact between native groups in the High

Plains and Central Rocky Mountains and Euroamericans would not occur until the beginning of the 19th century (Hafen 2000:43-45; Wishart 1979:52; Wood 2008:15). This direct, sustained contact is considered to be the threshold for the transition to the Historic period. For the purposes of this paper 1803 will be used to mark the onset of the Historic era as this is when the United States purchased the territory of Louisiana from France and effectively opened it for trapping and trading activity, resulting in a marked increase in the numbers of Euroamericans moving into the High Plains and Rocky Mountain regions during the first decades of the 19th century. The opening of the region led to the development of complex fur trading networks which came to dominate cross cultural contact for the next couple of decades.

This began to change by the mid-1830s as missionaries reached the High Plains and Rocky Mountains. Missionization was less intense than in other regions and likely had little impact on native activities and settlement practices. The relocation of indigenous peoples to reservations by the end of the century saw an increase in missionization activities.

Emigrants reached the region by the 1840s (Bagley 2007:157; Unruh 1993:118-120). Early emigrants were primarily passing through, allowing for peaceful interactions with native peoples. The loss of game, overgrazing of prairie lands, and depletion of timber and water resources that came with increases in Euroamerican emigration led to increased conflicts with indigenous groups (Hafen and Young 1938:178; Unruh 1993:169). As emigration increased bridges, ferries, telegraph, stage, and pony express stations, and other harbingers of permanent American settlement were constructed throughout the region.

Conflicts were initially brief, localized actions. As the number of Euroamericans moving through and living in the region increased so too did instances of conflict. The American government responded by establishing a string of military forts in the area to protect and support

emigration efforts. The initial military presence was limited and the governmental policy for dealing with the tribes involved a combination of treaty negotiations and small punitive expeditions to deal with native depredations.

Negotiations did little to deal with native concerns as Euroamericans continued to infringe on their lands and deplete valuable resources. Tension peaked in the 1860s and war broke out between the United States and several tribes. The resulting conflicts enabled the United States to forcibly subdue the native inhabitants, relocate them to reservations, and officially annex the region. By the 1880s, through treaty, threat of violence, or warfare the United States government had relocated the tribes and considered indigenous populations in the area "pacified" and no longer a threat to settlement.

Intensive settlement of the High Plains and Rocky Mountain regions came late and often developed in locations where trading posts, military outposts, ferries, telegraph, stage, or pony express stations, logging or mining camps, or railroad stops were or had been located. In many cases the influx of permanent settlers only came after the relocation of the tribes.

Prior to large scale emigration and the militarization of the region after 1840 Native American/Euroamerican interactions focused primarily on fur trading activities. Due to this, while transformative effects of settlement and missionization such as assimilation, acculturation, and cultural degradation, transformation, or destruction may have been present they would not have been felt as intensely until relatively late on the High Plains and in the Rocky Mountains. Primarily because, as Larsen et al. (2001:44) notes, in regions where trade marked the primary Native American/Euroamerican relationship fewer alterations were seen in indigenous lifeways. This is likely due to the fact that many of the mechanisms, such as physical and governmental infrastructure, used to influence or control native populations were missing in regions dominated

by primarily trade relationships. In these circumstances, in the absence of controlling mechanisms by Euroamericans, cultural groups operate in what Richard White (1991) referred to as the "Middle Ground".

In North American the "Middle Ground" is defined by regions or periods of time when Euroamerican and Native American populations interacted in a sphere where neither cultural group maintained a decided military advantage. As such, they are considered times and places of cultural negotiation, translation, and remaking as Euroamericans and Native Americans alike strived to find a means of gaining the cooperation and consent of outside cultural groups without the use of force. To do this both parties needed to attempt to understand the reasoning and worldview of the other. The parties also needed to assimilate enough of the foreign reasoning to put to their own use. This type of diplomatic discourse often resulted in groups operating in their own self-interests while justifying their actions according to the "others" cultural standards or premises (White 2009:248). In this manner both sides attempted to gain some level of insight into the others worldview so as to aid them in negotiating for their own personal advantages while maintaining amicable relationships.

Within, and prior to the establishment of, this "Middle Ground" research examining Native American/Euroamerican contact has found native populations to have been impacted by indirect and direct trading activity during the Protohistoric and Historic periods. Research dating back over a century cites the integration of indigenous populations in the West into Euroamerican fur trading activities and the introduction of trade items such as the horse and the gun through these networks as the impetus for a variety of changes to Native American cultural practices including shifts in social and political organization, increased raiding and warfare activity, the alteration of traditional subsistence and economic activities, a breakdown of existing

kinship systems, and a reorganization of religious belief (Abel 1939:72; Binnema 2001:86; Fox 1976:7; Hans 1907:25; Harrod 1995:10-17; Humfreville 1903:335; Jablow 1951; Lewis 1942:39; Madsen 1980:18; Moore 1987:138-139; Secoy 1953; White 1978:322).

Many researchers find that the aforementioned changes were brought about due to higher rates of cultural diffusion caused by increased contact via trading activities at Euroamerican posts and in indigenous trading centers and increased contact by cultural group with expanded territorial ranges brought about by access to horse transport (Hyde 1933:6-8, 70; Lewis 1942:41; Mandelbaum 1940-1941:187; Mishkin 1940:12; Secoy 1953:87). Elevated levels of cultural diffusion resulted in the exchange and sharing of religious beliefs and practices by tribal groups on the plains. This process led to shifts in religious and ritual practices such as the expansion and transformation of bundle complexes and ceremonial practices such as the Sun Dance amongst the Plains tribes (Ewers 1961:202; Harrod 1995:14; Lewis 1942:35-36; Secoy 1953:90). The acquisition of trade goods has also been attributed to the disruption of traditional indigenous manufacturing processes which undermined existing patterns of social status acquisition and ritual practice among the tribes (Lewis 1942:36). Others have found that the cultural transmission and transformation of religious belief and ritual practice started earlier during the Late Prehistoric period as a result of contact, focusing on the maintenance of trade relationships, between Plains hunters and village agriculturalists in the Missouri River region (Bruner 1961:205; Kehoe 1970:99-103; Lowie 1916:948; Wissler 1915:338). Regardless of origin, religious practices were believed to have been impacted by trading activity conducted through indigenous and Euroamerican networks from the Late Prehistoric through the Historic periods.

After 1840, in the High Plains and Rocky Mountain regions of the West, transformative pressures on religious belief and practice intensified with increased emigration and heightened

levels of militarization, missionization, and settlement activities in the area. In some cases, increases in these types of acculturative pressures has been linked with, at least the outward appearance of, changes to method of burial, type and/or inclusion of grave goods, and the presence of and/or the type of present burial marker/monument (Prince 2002:50).

The nature and intensity of changes to indigenous mortuary practice and underlying religious belief, believed to have been brought about by Native American/Euroamerican contact events and processes, is an issue that is still debated in the anthropological literature. This paper looks to add to this discussion through an analysis of burial contexts from the High Plains and Rocky Mountain regions.

ISSUES RELATED TO MODERN CONTACT STUDIES

When conducting an analysis of cultural contact events and processes there are a number of issues that must be considered. One must not base their analysis of the past on their knowledge of the future, one should seek to employ diachronic studies, and be aware of the complexities involving discussions of continuity and change to native cultures.

Analysis Based on the Past

It is often all too easy to approach discussions relating to cultural contact from the perspective of one who is aware of the outcome of indigenous/Euroamerican contact. This can

result in analysis and conclusions that focus on the negative consequences of contact rather than attempting to understand the motivations of individual cultural groups; the social, political, and economic processes at play; and the nature and implications of cultural contact as experienced by those individuals involved. One means of doing this is through the application of a diachronic perspective so as to allow for a more holistic picture of cultural developments and processes at work over an extended period of time.

The Need for Diachronic Studies

Current research has criticized the division of the human past into historic and prehistoric periods, finding them to be arbitrary temporal boundaries that negatively influence modern academic investigations (Silliman 2004; Stahl 2012). The use of these designations can divide the past of a people, such as native populations in the United States, into artificial categories that may not accurately reflect historical developments within that culture. Modern academic investigations can treat these divisions as reality, studying either the "prehistoric" or "historic" past of a people. The result is that people, events, and historical processes can be overlooked by prehistoric and historic archaeologists alike.

With this in mind it becomes clear that in order to provide a better understanding of the contact period one must begin by examining pre-contact native cultures. As early as the 1990's anthropologists were promoting diachronic studies founded in the belief that to truly understand any cultural process the preceding events, in some cases dating back centuries, must be examined (Lightfoot 1995:199). So, to understand the cultural transformations of the Historic period we

must first gain a better understanding of cultural processes at work during the Late Prehistoric and Protohistoric periods.

Issues Relating to Continuity and Change

When examining the transitions from the Late Prehistoric to the Protohistoric and then the Historic periods the focus can tend to highlight the nature of social, political, or economic change that came as a result of cultural contact. Binnema (2001:3, 16) finds that defining cultural contact processes in terms of cultural clash, cultural change, or cultural continuity denies the more complex past of the individuals of study and is more representative of modern theoretical perspectives than the perceptions and interests of these cultural groups. This statement reflects the unease of many modern researchers with using cultural change as a metric for examining indigenous populations. Indeed there are a number of issues that arise when examining native cultural change. When the level of investigation is limited to cultural change research can overlook or deny the manner in which personal choice, native agency, and individual native histories shape events of the past. The manner in which these cultural interactions influenced Euroamerican groups can also be overlooked.

While these are serious issues that researchers must be cognizant of, there is no denying that the introduction of Euroamerican items, ideas, people, and technologies impacted indigenous societies across the American West. Historical events and processes such as the introduction of the fur trade, Euroamerican emigration, missionization, and the militarization of the region similarly influenced indigenous groups on the High Plains resulting in broad historical patterning in the cultural development and historical trajectory of indigenous societies in the region.

However, the level of influence that these people, events, and processes had is fluid across time and space; primarily because patterns of technological, social, cultural, political, and economic change are spatially and temporally variable (Mitchell and Scheiber 2010:11). So, while broad cultural and historical patterns such as the transition towards a bison economy, the adoption of the horse and firearm, the development of a mobile horse culture, and the movement to reservations in the late 19th century emerge in the West during the 17th, 18th, and 19th centuries the manner in which individual tribal groups participated in, understood, and reacted to these developments is governed by differential responses to internal and external stimuli by indigenous groups based on ecological/environmental conditions, existing tribal belief systems or cosmologies, and differing historical precedents.

In the High Plains and Rocky Mountain regions of North America Euroamerican goods arrived well before direct contact between natives and Euroamericans occurred. Historic records provide accounts of items such as the gun and horse influencing indigenous social status and being integrated into tribal medicine soon after their introduction (Ewers 1997:49-50). However, even as Euroamericans and Euroamerican items were integrated into tribal systems, it is likely that larger indigenous cultural systems and cosmologies remained intact as changes in material culture do not necessarily lead to changes in larger culture processes (Sahlins 1994; Stahl 2012).

The question then becomes how do we interpret and understand changes in material culture and the relationship of these changes to larger cultural systems. To successfully do this one must avoid the pitfall of assuming that change and continuity are separate and distinct outcomes of contact (Silliman 2009:212-213). Rather, it should be kept in mind that culture, tradition, and identity are not static; they are actively and continually reinforced and contested (Tveskov 2007:432). In reality, for a culture to function and remain viable it must change. A

point supported by Silliman (2009:226) in declaring that "change and continuity are one and the same thing or at least particular dimensions of the same phenomenon" and for a culture to "move forward they must change and remain the same. But to have moved forward means to have carried on". This process of cultural change and continuity was at play in the Late Prehistoric, Protohistoric, and Historic periods and continues to be a factor in the development of indigenous and Euroamerican cultures. So while Binnema is correct in stating that investigations of the past should not be reduced to oversimplified analysis of how a group changed or remained the same, there is no avoiding the fact that in some cases change did occur, cultures did persist, and these issues should be examined.

EXAMINING CONTINUUITY AND CHANGE IN MORUARY CONTEXTS

Recent work examining continuity and change, issues of assimilation and acculturation, and the integration and use of Euroamerican values, ideas, and technologies by indigenous societies has been conducted by a number of researchers (Hodge 2005; Prince 2002; Rubertone 2001; Scheiber and Mitchell 2010; Silliman 2009; Stahl 2012; Tveskov 2007). Rubertone (2001), Prince (2002), and Hodge (2005) have approached these issues through an examination of historic native mortuary practices. This type of investigation is particularly useful for archaeologists because as Rakita et al. (2005:16, 19) states "Death is an easy category for archaeology, a conjunction of actual individuals and specific cultural practices, conveniently buried or entombed, thereby increasing the probability of preservation and recovery…A

mortuary site is not, however, just a repository for the dead or for information about the dead-it is a window with a much wider view of their world".

Within mortuary contexts the physical remains can tell us how a person or people lived providing data on age, sex, stature, genetics, health and disease, foodways, population demographics, and instances of violence (Parker Pearson 1999:3; Tarlow and Stutz 2013:3). Perhaps more importantly, at least for the analysis in this paper, these same burial contexts, through an analysis of the associated cultural material and contextual elements of the burial including construction and layout of the grave and the treatment of the corpse can provide us information about the individuals' who interred the corpse (Baadsgaard et al. 2012:16; Parker Pearson 1999:3; Tarlow and Stutz 2013:3). This is because mortuary practices involve the "manipulations of material culture, social relations, cultural ideals, and the human body" (Rakita et al. 2005:1). These funerary contexts provide opportunities for the living to actively manipulate or re-work social, political, ethnic, and material structures through the idealized or ritualized representation of the dead (Parker Pearson 1999:4; Rakita et al. 2005:8; Scott 2012:56). In doings so they provide anthropologists' a "glimpse into a more abstract world of ideas and beliefs about life and death and how people viewed their place in the world: what we call cosmological beliefs" (Tarlow and Stutz 2013:5).

From this perspective, mortuary practices such as burial type, body position and directionality, can provide insight into native cosmology, worldview, or spiritual understanding (Rubertone 2001:133). Likewise, the type and amount of grave goods can provide data on social inequality, insight into how native groups responded to colonialism, how items were used to identify connections between kin and community, and reveal information on how items were incorporated into native traditions (Rubertone 2001:139, 145). Other researchers have shown that

mortuary practices are integrally linked to factors such as social, demographic, and economic conditions (Aries 1981; Brown 1995:7). Finally, Rubertone (2001:164) finds that graves "tell as much about historical consciousness, and a continuing sense of identity as people, as they do about material acquisitions and new technological skills". This connection to a wide range of cultural traditions, beliefs, and methods of organization allow a culture's mortuary practices to, as Gilchrest and Sloan (2005) state, crystallize a set of beliefs in visibly intentional ways. In doing so they provide a valuable conduit through which to examine issues of continuity and change (Vitelli 2011:178) relating to a wide range of cultural processes through time.

The studies conducted by Rubertone (2001), Prince (2002), and Hodge (2005) investigated native grave goods, interment strategies, and the types and frequency of various grave markers. All of these studies found that Euroamerican goods and burial practices were adopted by indigenous populations at some level. While the integration of these items and practices represent change, these researchers determined that these changes simply masked continuity in indigenous belief systems as these foreign introductions were used for traditional native activities and/or given a uniquely native meaning.

MORTUARY CONTEXTS ON THE HIGH PLAINS AND ROCKY MOUNTAINS

Native/Euroamerican contact processes in the High Plains and Rocky Mountain regions can also be examined through an investigation of indigenous mortuary practices. The prehistoric/historic transition in the region presented an ever evolving landscape to Native

American populations; making this period a focus of study for anthropologists, social historians, Native American scholars, and others. In the High Plains and Rocky Mountain regions social, political, and economic systems had begun to change as early as the Late Prehistoric period due to environmental and demographic pressures. By the 18th century European goods such as tools, weapons, textiles, personal adornments, and the horse reached the area. Shortly thereafter, Euroamerican traders and trappers made their way into the region. These individuals introduced new languages, ideas, worldviews, and diseases. The examination of mortuary data from the High Plains and Rocky Mountain regions can provide insight into how native populations dealt with and were influenced by this fluid landscape. This can be accomplished through an analysis of variation in interment types and changes to grave good types and frequencies through time.

This analysis can best be accomplished through the employment of a regional, diachronic approach. The examination of burial practices over an extended period of time allow one to more fully comprehend and appreciate not only similarities and differences in interment strategies through time but also allow for a deeper discussion on the significance of specific burial traits present during any given period through an analysis of the connection, or disconnect, that they have with cultural practices before and after their usage.

The Research Question

The analysis of the impact that the introduction of Euroamerican goods and technologies had on Native American burial practices will be based on several general expectations. First, the persistence of traditional interment strategies will be considered representative of continuity in mortuary practice through time while shifts or breaks in interment strategies across time will be

seen as indicative of change in indigenous mortuary practice. Second, the continued inclusion of items of native manufacture alongside items of Euroamerican manufacture will be seen as indicative of continuity in mortuary practice while the paucity of indigenous items or the abandonment of traditional indigenous burial artifact types may be seen as reflective of change.

The final expectation involves the presence of Euroamerican goods in native burial contexts. However, the analysis of Euroamerican goods comes with a caveat. Often when categorizing artifacts in contact period assemblages they are classified as native or Euroamerican. The distinction between the two is determined by the producer of the item, not the individual or group that used, discarded, and gave meaning to the artifact (Silliman 2009:213). The issue at hand here is that this classification system, when used to discuss issues of continuity or change, naturally sets up a situation in which indigenous cultural change is taken as given simply due to the increased inclusion of items of Euroamerican manufacture in the assemblage. However, as was discussed earlier while the introduction of an item is a change for a cultural group it does not immediately translate into changes to larger cultural or belief systems.

To prevent an oversimplified one to one analysis where the introduction of new items equals larger cultural change we need to modify the manner in which we categorize or conceptualize items in the archaeological record. Rather than focusing on the producer of an item, researchers need to view objects in their social context when examining their meaning to a cultural group (Silliman 2009:214). Diana Loren (2001a, 2003, 2008) and Laurier Turgeon (1997) through an investigation of personal adornment and copper kettles, respectively, have both shown how Euroamerican manufactured items have been incorporated into indigenous systems and given native meanings. Christina Hodge's (2005) work on an 18th century Native American cemetery finds that the appearance of Euroamerican forms does not simply mean

processes of acculturation were at work; rather the introduction of these items could be evidence of mimicry, hybridization, or appropriation of cultural forms by native groups. This work highlights how the level of analysis should focus on how an item is used and given meaning rather than focusing simply on placing items in Native American or Euroamerican categories based on origin of manufacture (Loren 2001b:67). From this perspective this study will identify cultural continuity in scenarios where Euroamerican manufactured goods with indigenous analogues are used in native ways for native tasks by indigenous groups. Scenarios where new Euroamerican goods with no existing indigenous analogues will be seen as suggestive of possible cultural discontinuity or change.

Native American burial practices will be investigated through an analysis of 20 Protohistoric and Historic period burials. Burial type, location, age, sex, and associated material will be identified. Dating brackets will be defined through the identification of temporally diagnostic artifacts; an analysis of trade bead color variation, size, and uniformity; and the elemental analysis of glass trade beads and steel artifacts. Variation in associated burial material will also be examined.

It is expected that the analysis of this data should show that traditional native interment types, i.e. scaffold, rock shelter, or cairn, will be used through the Historic period. While Euroamerican items will be used as grave goods, the nature of the burial goods will remain the same (i.e. glass beads will be used instead of shells beads, native pigments will be replaced by traded pigments such as vermillion, or personal items such as points, bowls, or robes will be supplemented by Euroamerican trade goods). Even as Euroamerican items increase in more recent burials, burial styles will remain the same. Traditional native grave goods will continue to be found in Protohistoric and Historic period graves even as Euroamerican substitutions are

available. Meeting these expectations will show that Protohistoric and Historic Native American burial practices show continuity with indigenous interment strategies from the Late Prehistoric.

Potential limitations of this analysis involve the accuracy of the date brackets and the representative nature of the study sample. Burial numbers are limited to those available in the University of Wyoming collections. Still, the sample of 20 includes interments from the Protohistoric and Historic periods, providing burials from the entire study period. Dating may also be a potential limitation. It will not be possible to extract exact dates for each interment. Rather date ranges will be provided, leaving some burials straddling temporal periods. This can be dealt with by placing the date ranges into a continuum rather than into distinct categories. The analysis will focus on identifying changes and/or continuity within this continuum, alleviating any issues with classifying burials in specific categories.

METHODS

To accomplish the goals set forth in the previous section I examined 20 burials (Table 1.1) located in Wyoming and Montana (Figure 1.1) from the University of Wyoming Department of Anthropology Human Remains Repository (HRR). For each burial I recorded burial type, sex, age, associated burial material, and date brackets available in HRR records (Table 1.2). As necessary I conducted analysis on associated burial material to accurately identify items within the assemblage and to help refine dating brackets. The burial analysis was integrated with Scheiber's (2008) synthesis of Late Prehistoric native burials from the High Plains and Rocky

Mountain regions in an effort to provide a more complete overview of burial forms and practices from the region. The Late Prehistoric/Protohistoric periods were a time of transition, marked by the movements of tribal groups such as the Lakota Sioux, Cheyenne, Arapaho, Crow, and Shoshoni into the area as early as the Late Prehistoric period. Due to this an analysis of historic, ethnographic, and archaeological information on traditional burial forms for these tribes was also conducted so supplement the regional data.

Table 1.1. Burials

Burial #	Site/Common Name	Primary Reference
HR004	Torrington Burial	Agogino 1963; Howells 1938
HR006	City Springs Burial	HRR files
HR015	Crow Scaffold	Mulloy 1958
HR019	Pitchfork Rockshelter	Scheiber 1994
HR020	Pitchfork Rockshelter	Scheiber 1994
HR049	Hudson Falls Creek	
HR051	Fort Benton Burial	Aaberg 1975
HR056	The Lingle Burial	Basgall 2006
HR132	The Bridger Gap Burial	Truesdale and Gill 1987
HR139	Archives Child	HRR files
HR188	The Nunn Burial	JEI 2008
HR220	QC5 Ranch	HRR Files
HR258	Sheridan WAS	HRR Files
DB140	Chalk Butte	HRR Files
DB141	Lame Deer	HRR Files
DB142	Barbula	HRR Files
FC050	The Marbleton Mummy	Ottman 1992
DB143	Prairie Dog	HRR Files
48WA9	Near Spring Creek	HRR Files
FC10-15-08	Baby Doe	HRR Files

Figure 1.1. General locations of burials included in this study (Google 2013).

Dating

Prior to engaging in an analysis of how burial types changed or stayed the same over time, and how this was related to issues of continuity or change in native societies, each burial in the HRR sample was assigned a date range. When available, Euroamerican manufactured items

Table 1.2. Burial Attributes.

Burial	Age	Sex	Ethnicity	Burial Type	Primary/ Secondary	Estimated Dating Brackets
HR004	22-24	Female	Possible Sioux	Scaffold/tree	Primary	1850-1880
HR006	21-24	Female	Unid.	Pit	Primary	1850-1880
HR015	3.5-4.5	Male	Crow	Coffin and Cairn	Primary	1870-1910
HR019	27-35	Male	Crow	Crevice/rockshelter	Primary	1800-1840
HR020	25	Male	Crow	Crevice/rockshelter	Primary	1800-1840
HR049	1-1.5	Unid.	Unid.	Crevice/rockshelter	Primary	1700-1880
HR051	60-70	Male	Unid.	Stone lined burial pit	Primary	1700-1880
HR056	18-25	Female	Sioux	Pit/Coffin	Primary	1825-1868
HR056	Fetus to Less than 1 year	Unid.	Sioux	Pit/Coffin	Primary	1825-1868
HR132	60+	Female	Possible Shoshone	Crevice/rockshelter	Primary	1800-1920
HR139	2.5-3.5	Unid.	Unid.	Cairn	Primary	1721-1921
HR188	30-39	Female	Unid.	Crevice/rockshelter	Primary	1850-1880
HR220	12-15	Female	Unid.	Crevice/rockshelter	Primary	1700-1803
HR258	18-45	Male	Unid.	Crevice/rockshelter	Unid.	1860-1920
DB140	Unid.	Unknown	Unid.	Unid.	Unid.	1840-1880
DB141	1-3	Unknown	Cheyenne	Unid.	Unid.	1900-1920
DB142	Unid.	Unknown	Unid.	Crevice/rockshelter	Unid.	1850-1880
DB143	Unid.	Unknown	Unid.	Scaffold/tree	Unid.	1700-1880
FC050	24-30	Male	Shoshone	Crevice/rockshelter	Primary	1880-1882
48WA9	Unknown	Unknown	Unid.	Unid.	Unid.	1850-1880
FC10-15-08	1.7-2.3	Male	Euro/Native American	Crevice/rockshelter	Primary	1730-1810

with dateable properties were used to provide temporal brackets to a given burial. Button style, button shank type, shell hair pipes, nails, wool trade coats, trade points, cotton fabric, safety pins, collar studs, rifle cartridges, hand gun types, and stamped makers marks all provided dating information for this study. However, one goal of this project was to provide as many lines of data as possible for each burial to return the most accurate date brackets. To this end radiocarbon dates, variability in glass bead size, sphericity, and color, and the elemental composition of glass beads and steel artifacts were examined to supplement the historic artifact data.

Artifacts

One of the most common glass items found in the High Plains and Rocky Mountains in the 18th and 19th centuries was the trade bead. Changes in morphology, style, manufacturing technique, and chemical makeup have been used to create a chronology for sites in the American Northeast (Fitzgerald et al. 1995:117). While there is no detailed dating template for the High Plains and Rocky Mountains that can be applied to the entire region, beads are still useful temporal markers.

There was great variability in bead types found in North America. Beads could be of blown, wire wound, hot drawn, or mandrel pressed manufacture, each with a range of colors, forms, and decorations. A number of classification systems allowing for the universal application of bead analysis have been developed (Karklins 1985; Kidd and Kidd 1970). This work still sees revision today. While there remains variability in the application of bead classification methods, bead manufacture, size, and assemblage color variation are useful in dating archaeological sites.

Mandrel pressed beads are manufactured by drawing molten glass around a thin mandrel then pressing the glass into a preformed mold. An analysis of mandrel pressed beads reveals identifiable morphological changes that correlate with shifts in the manufacturing process over time. Mandrel pressed beads were developed in Bohemia in the 18th century and were being utilized as trade beads in North America by 1825 (DeVore 1992:43). Changes in mold form, hole punching techniques, and facet design resulted in identifiable, physical characteristics that could be used to accurately identify their period of manufacture (Ross 1988). Mandrel pressed beads made between 1825 and 1850 have two mold seams, a single horizontal seam by 1875, and

after 1915 the seam was vertical. They had a biconical hole from 1825 to 1860, a single conical hole by 1875, and a straight hole by the 1890s. Mandrel pressed beads made from 1825 to 1865 exhibit ground facets, molded facets after 1875, and overlap of the two forms between the two dates (DeVore 1992:43-45).

Hot drawn beads are the primary bead type found in the High Plains and Rocky Mountain regions. These beads are manufactured by drawing molten glass, with an air bubble in the middle, into long tubes. As the tube of glass cools the bubble serves as the hole for the bead. The tube was then snapped or chopped into bead sized increments which were then tumbled in sand to smooth the edges. Hot drawn bead size and color variability are considered temporally diagnostic traits for this manufacture type (DeVore 1992:14, 61; Dubin 2004:274; Reher 1993; Reher and Scheiber 1992; Scheiber 1994:38, 40, 47; Wildschut and Ewers 1959:45; Woodward 1970:37). Beads measuring between 3mm and 5mm in diameter, sometimes called Pony or Pound beads, generally date from the late 18th/early 19th century until the mid-19th century (DeVore 1992:61; Scheiber 1994:38). Smaller Seed beads replaced the larger beads, became prominent after 1840 (DeVore 1992:14; Dubin 2004:274; Scheiber 1994:38). Color variability also changed through time. White, blue, and black beads were the earliest colors traded and were the most common during the early 19th century (Dubin 2004:274; Scheiber 1994:47). Diverse colors did not become common until after the introduction of Seed beads (Wildschut and Ewers 1959:45; Woodward 1970:37). One needs to be careful in the application of this formula as in any period there was a range of variability in bead sizes and colors.

Building on the observation that bead sizes are in some manner related to time, Dr. Charles Reher and Dr. Laura Scheiber developed a regression analysis, based on bead diameter and length, for dating sites in southeastern Wyoming (Reher 1993; Reher and Scheiber 1992).

The formula was initially developed by Dr. Charles Reher with assistance from Laura Scheiber who was at the time a University of Wyoming student. Dr. Scheiber continued to work with the formula after her graduation. This formula was generated by measuring several hundred beads from two well dated sites and one undated site. The well dated sites included the Pitchfork Rockshelter burials, burials analyzed for this paper, and the Wyoming burial, a grave disturbed by construction activity on the Wind River Reservation. The disturbed grave was salvaged and analyzed at the request of the Shoshoni and Arapaho tribes. While the tribes consented to laboratory analysis of the recovered materials the resulting report is considered confidential. The undated beads came from the Rabou Ranch burial, a probable but disturbed scaffold burial site with large amounts of beads but no other associated artifacts. This work showed that no more than 200-300 beads were needed for a statistically relevant sample from a given collection (Reher 1993).

The clustering of bead assemblages and the distribution of the undated site between the relatively well dated early and late site indicated that there was a temporal relationship between bead size and date of manufacture. The Reher/Scheiber equation is as follows: Estimated Date = -62.5(Mean Outer Diameter) + 2003.75. Reher/Scheiber dates for each burial, and their relationship to estimated dating brackets derived from temporally diagnostic artifacts and radiocarbon dates, are presented in Table 1.3. Bead samples from the Bordeaux site are also included as these beads were recovered from burials associated with a 19th century trading post in eastern Wyoming with relatively tight associated dates, 1849-1868, provided from historical documentation of the construction and use of the post (Pierce 2012:37). As such the Bordeaux beads provide a comparative sample for the rest of the bead study.

Table 1.3. Associate Bead Measurements.

BURIAL #	SITE/COMMON NAME	SAMPLE SIZE	MAXIMUM BEAD WIDTH (MM)	MINIMUM BEAD WIDTH (MM)	MEAN OF THE MAXIMUM (MM)	MEAN OF THE MINIMUM (MM)	MEAN SPHERICITY	REHER AND SCHEIBER FORMULA	ESTIMATED DATING BRACKETS
BORDEAUX		520	3.90	1.16	2.37	2.28	96.55	1855.6	1848-1868
DB140	Chalk Butte	29	3.45	1.41	2.03	1.97	97.13	1876.9	1840-1880
DB142	Barbula	148	2.87	1.09	1.90	1.83	96.16	1885.0	1850-1880
HR004	Torrington Burial	274	3.18	1.22	1.86	1.79	96.28	1887.5	1850-1880
HR019	Pitchfork Rockshelter	268	3.96	2.23	3.09	2.94	95.35	1810.6	1800-1840
HR020	Pitchfork Rockshelter	222	4.07	2.17	3.25	3.08	94.79	1800.6	1800-1840
HR006	City Springs Burial	250	4.01	2.08	3.57	3.38	94.76	1780.6	1850-1840
HR188	The Nunn Burial	432	4.54	1.71	3.43	3.29	95.91	1789.4	1850-1880
HR258	Sheridan WAS	4	2.18	1.82	2.08	2.03	97.46	1873.8	1860-1920
FC10-15-08	Baby Doe	11	4.08	4.06	3.73	3.56	95.26	1770.6	1730-1810
PRAIRIE DOG	Prairie Dog	3	6.12	2.96	5.12	4.39	84.28	1683.8	1700-1880
48WA9	Spring Creek Cave	178	2.84	1.70	2.19	2.08	95.20	1866.9	1850-1880

Changes in bead metrics over time were further examined within our sample through an examination of bead size and sphericity. Bead sizes were obtained from existing HRR data sets or manually be the author by measuring individual beads with electronic digital calipers accurate to within .02 mm. Each bead was mounted on a tack through the center hole and multiple measurements were taken around the circumference of the bead to obtain the maximum and

minimum width. Bead lengths were obtained by placing the bead in the flat section of the caliper jaws. Bead assemblages of less than 200 beads were measured in their entirety. For assemblages over 200 beads a minimum 20% sample was taken with exception of HR188 where 432 of approximately 7800 beads were measured.

Using this data, bead plots were generated for each burial using the maximum and minimum bead width to explore differences in bead size (Figure 1.2). Plots were also generated using bead sphericity (the minimum bead width ÷ the maximum bead width) and bead thickness to examine uniformity in bead shape (Figure 1.3). These figures use ellipses to estimate the total area covered by each plot. In Figure 1.3 the ellipse extends the bead sphericity past 100%. No beads had a sphericity of more than 100.These plots were created to investigate the relationship of changes to bead size over time and to determine if bead uniformity increased with time as manufacturing techniques improved.

The elemental analysis of glass beads and steel artifacts was also conducted as a dating measure. Changes in the chemical makeup of glass beads associated with transitions in manufacturing technique have proved an informative form of temporal analysis. White hot tumbled beads employed tin (*Sn*), Antimony (*Sb*), Arsenic (*As*), and Fluorine (*F*) as ocifiers and the use of these elements changed through time. Bead assemblages from sites with tightly assigned dates (generated from radiocarbon dating, temporally diagnostic artifacts, and historical documentation) were used to create a chronology (Table 1.4) (Hancock et al. 1999; Hancock, Aufreiter, and Kenyon 1997; Kenyon et al. 1995a; Sempowski et al. 2000). White bead analysis is a presence/absence process by which elements are identified as being in a sample. Similar chronologies have been created based on mineralogical differences in turquoise, dark blue, and red beads (Hancock et al. 1994, 1996, 2000; Kenyon et al. 1995b; Sempowski et al. 2001).

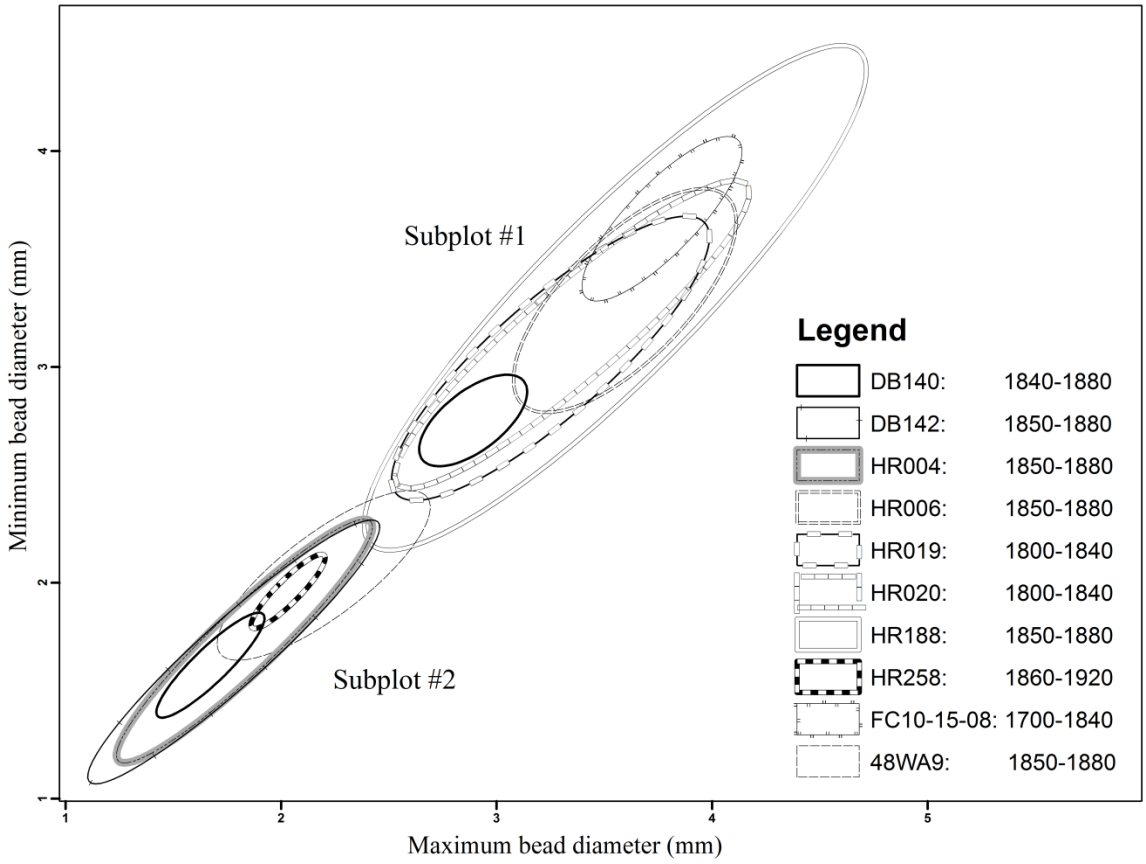

Figure 1.2. Plot of bead minimum and maximum diameters by burial.

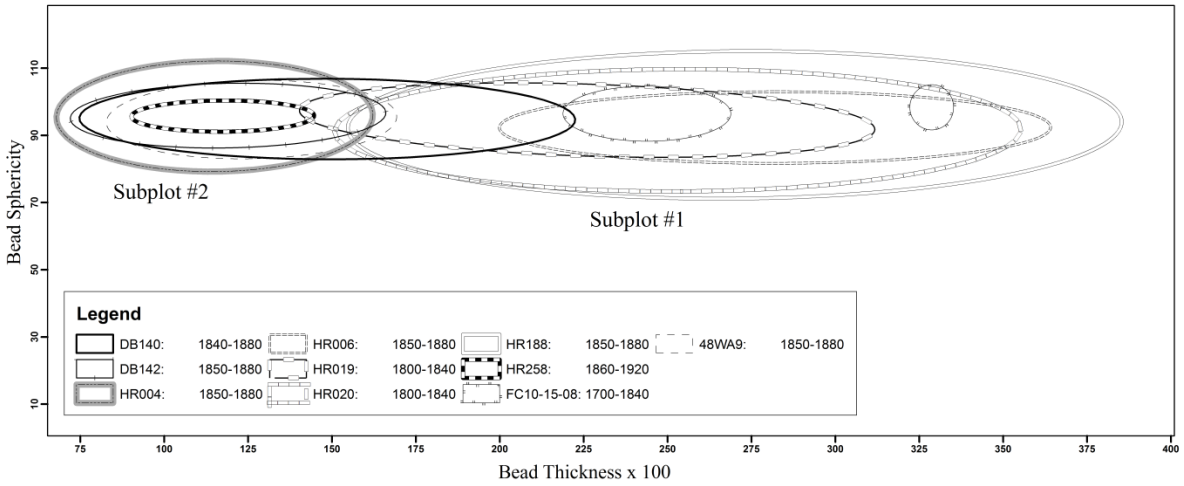

Figure 1.3. Plot of bead sphericity and maximum thickness by burial.

Table 1.4. Relationship between White Bead Ocifiers and Date Brackets.

OCIFIER	ASSOCIATED DATES
SN	Pre 1670
SB	1650-1850
AS	1850-1950
F	1880-1950

The analysis of turquoise beads is somewhat more difficult. Whereas white bead ocifier analysis is presence/absence the elemental analysis of turquoise beads requires the identification of the percentage of seven specific elements. Variation in the amount of these elements in a sample in relation to one another allow for the placement of a bead in a specific time frame (Table 1.5).

Research has also shown that the shift from the cementation to crucible steelmaking process during the mid-18th century led to changes in the microstructure of the metal itself. These changes are identifiable using a Scanning Electron Microscope. Additional changes in steel manufacturing led to the introduction of manganese into the process after 1840 (Wiltzen and Wayman 1999). This information allows for date brackets to be applied to unidentifiable metal fragments through microstructural and chemical analysis.

This project analyzed the elemental composition of white and turquoise beads from seven burials (HR004, HR006, HR188, HR258, DB140, DB142, 48WA9) and examined steel fragments from three burials (HR004, HR188, HR258) for the presence of manganese. I must note that this method of bead analysis was developed in northeastern North America where beads from well dated sites were analyzed in an effort to create a chronology that was applicable to the rest of the region. The use of this analysis in the High Plains and Rocky Mountains should be considered experimental as this procedure was not developed for this region. To address this, the sample used for analysis comes from, in most cases, burials with additional dating information in the form of radiocarbon dates, dateable historics, and/or complementary bead size and color analysis. Additionally, beads from the well dated Bordeaux Trading Post site were included in the sample to further address the accuracy of the application of this type of analysis in this region.

Table 1.5. Relationship between Turquoise Elemental Breakdowns and Date Brackets. Adapted from Hancock, Chafe, and Kenyon 1994; Hancock, Aufreiter, Moreau, and Kenyon 1996; and Kenyon, Hancock, and Aufreiter 1995.

Al%	Ca%	Cl%	Cu%	K%	Na%	Mn ppm	Associated Date Brackets
0.63±0.16	1.8±0.7	1.29±0.15	1.23±0.23	< 2.6±0.6	10.2±1.0	320±250	1580-1600
0.62±0.20	3.4±1.0	1.55±0.26	0.97±0.28	< 3.2±1.1	11.4±0.7	660±490	1600-1650
0.57±0.10	4.6±1.0	2.00±0.36	0.88±0.15	< 2.4±1.0	11.9±1.0	539±534	1660-1760
0.62±0.14	4.7±0.9	1.66±0.15	0.92±0.16	< 4.1±0.7	9.5±0.8	436±181	1760-1840
0.37±0.03	1.5±0.4	0.93±0.05	1.78±0.07	5.3±0.9	10.3±0.5	186±54	1760-1840 (Sb rich)
0.42±0.30	1.9±1.6	0.61±0.49	1.56±0.67	< 4.8±2.4	6.1±2.3	391±456	1840-1900
1.82±0.78	3.1±1.1	< 0.23±0.05	0.97±0.43	< 2.7±1.4	11.6±2.1	< 142±123	1900-1930

The use of Comparative Datasets

Using this temporal information the dataset from the HRR was compared to the regional data to identify consistency with or variation from the regional burial forms through time. This information was supplemented with data on traditional Lakota Sioux, Cheyenne, Crow, Arapaho, and Shoshoni burial practices drawn from historic, ethnographic, and archaeological records. Data on burial practices from these groups was included in an effort to compensate for demographic changes, primarily in the form of migration, seen throughout the High Plains and Rocky Mountain regions during the Late Prehistoric, Protohistoric, and Historic Periods. The movement of cultural groups into and through the region during the 16th, 17th, 18th, and 19th centuries leaves open the possibility that tribal groups occupying the region historically were not the same indigenous populations inhabiting the region during the prehistoric era. To ensure the

inclusion of historic populations in the study, the burial practices of native groups in the region during the latter periods were included in the background sample.

This study acknowledges that burial forms differ between native groups and that issues relating to migration, marriage partner exchange, and the exchange of cultural values and ideas can add variability to inter group burials while simultaneously causing overlap between intra group burial forms. However, when one compares the range of native burial forms to Euroamerican burial traditions during this period native intra group variation diminishes in comparison to Euroamerican burials.

Using the regional and cultural data as a baseline the HRR dataset was then analyzed. Burial type, location, age, sex, and associated cultural material were examined for each burial. The methods of interment as well as the associated burial goods were compared to the regional model. This comparison looked to identify the manner in which Euroamerican goods and burial styles, such as the use of coffins and sub-surface burials, were integrated into native burials. Burial types was examined to determine if traditional native burial forms persisted through time and to investigate the manner in which Euroamerican burial forms were adopted and integrated into native burial systems. Associated grave goods were examined to determine the manner in which items of native manufacture were included after the introduction of Euroamerican goods and to identify the type of Euroamerican goods included in native burials.

RESULTS

The review of 20 Protohistoric and Historic period burials included five interment types including crevice/rockshelter, scaffold/tree, pit, cairn burial, and coffin burial types (see Table 1.1). None of these burial forms were recovered from organized cemeteries. Crevice and rockshelter burials have been recorded as one form although they are representative of distinct interment styles. This is due to a lack of clarity in some ethnographic, historic, and archaeological records which prevented the author from accurately differentiating between the two types. The following section provides the results of the bead plot and element analysis, a brief synopsis of each burial, the associated dates and dating methods used, and will conclude with a discussion of the interment types and associated grave goods.

Bead Plots

Bead width and sphericity charts both show a good amount of variation within each sample. They also a reveal a break in distributions between subplot 1, containing HR006, HR019, HR020, HR188, and FC10-15-08, and subplot 2, containing HR004, HR258, DB142, and 48WA9 (Figure 1.4, Figure 1.5, Figure 1.6, Figure 1.7). DB140 has groupings with each of the subplots in Figure 1.2, however when plotted using sphericity this sample falls in with subplot 2. Subplot #1 appears to be a grouping of burials with earlier dates while those burials in subplot #2 generally return a later date range. The exception being HR188 which, while returning early dates based on bead plots, dates to after 1850 based on diagnostic artifacts recovered from the burial. The larger bead sizes, responsible for the earlier date range in the subplots, are likely a result of curated, and thus older, beads in the assemblage.

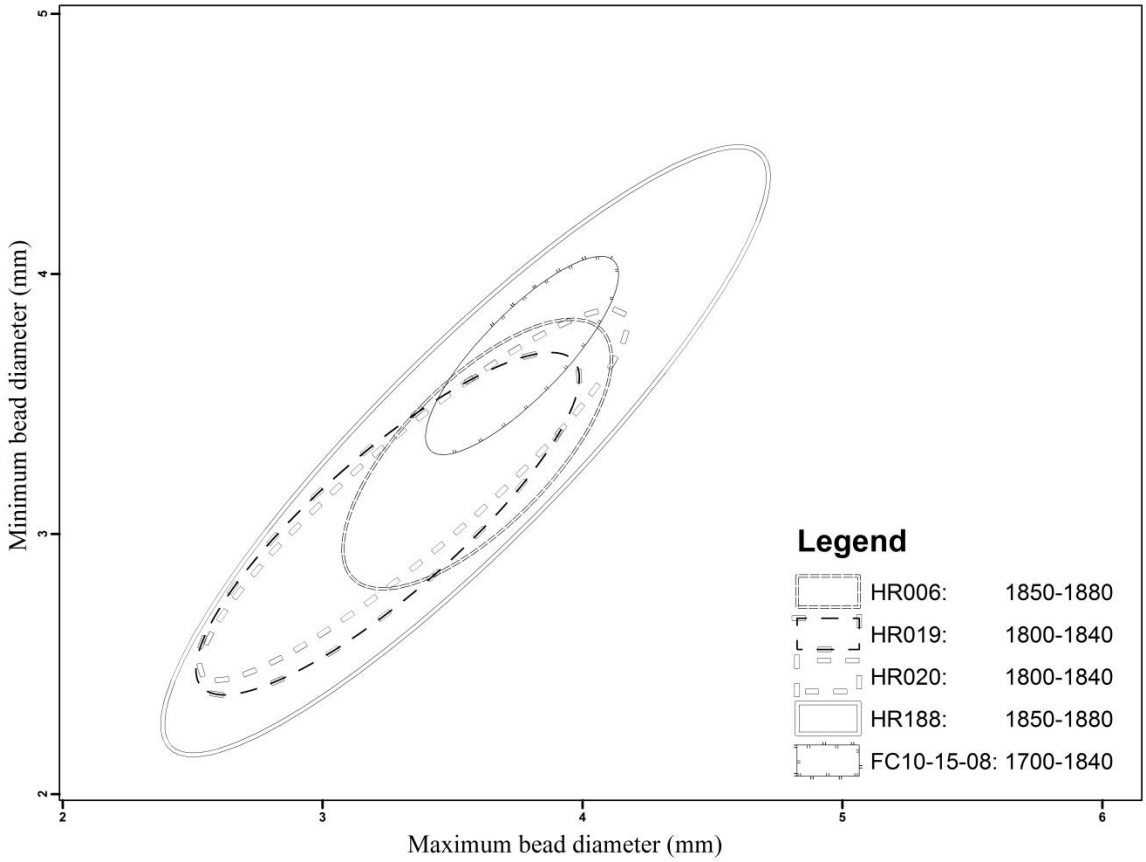

Figure 1.4. Subplot #1 of bead minimum and maximum diameters by burial

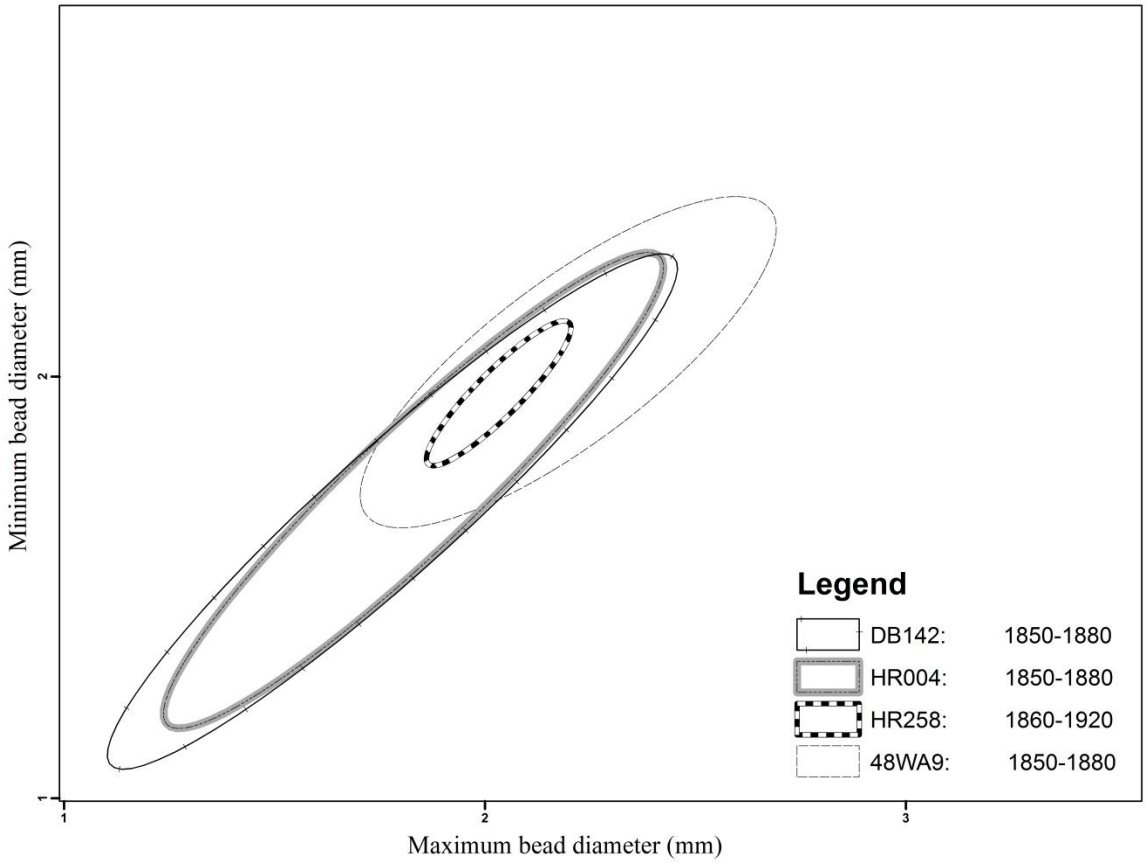

Figure 1.5. Subplot #2 of bead minimum and maximum diameters by burial.

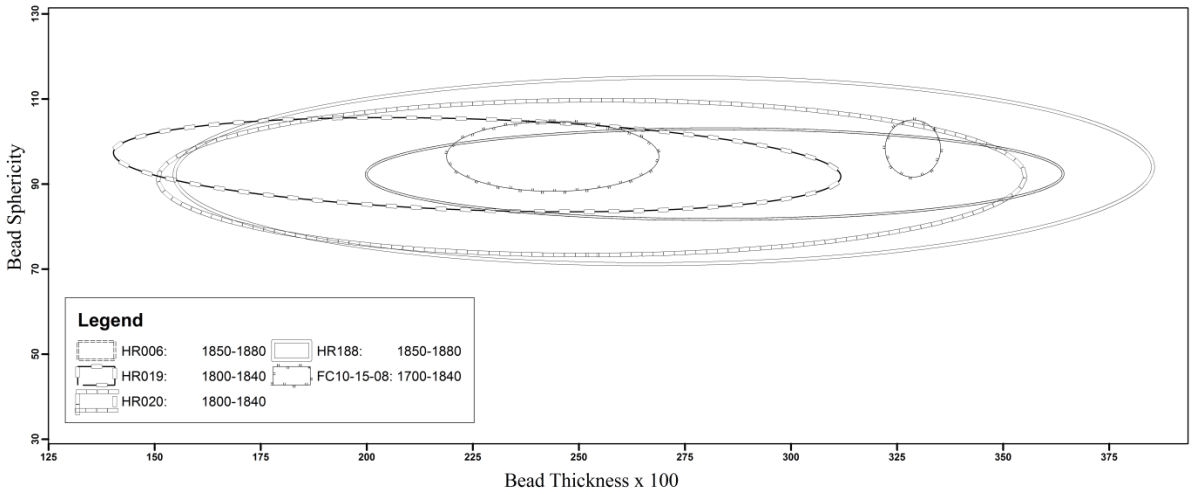

Figure 1.6. Subplot #1 of bead sphericity and maximum thickness by burial.

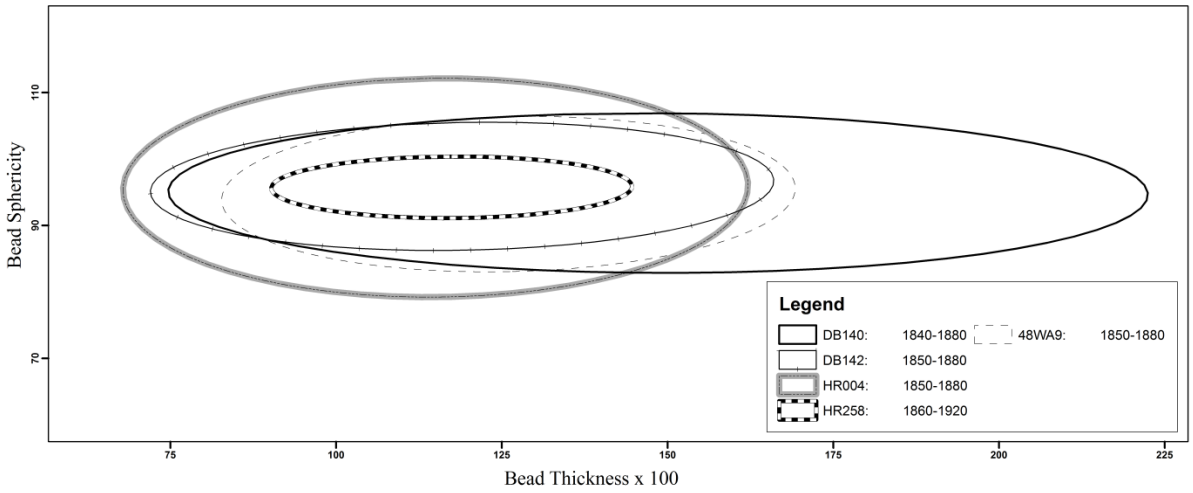

Figure 1.7. Subplot #2 of bead sphericity and maximum thickness by burial.

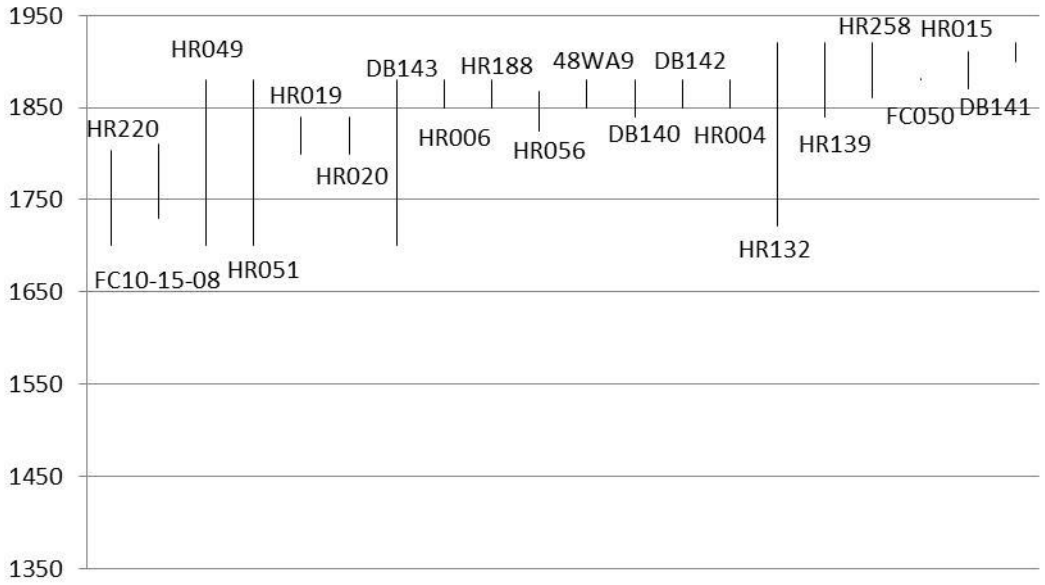

Figure 1.8. Burial dating brackets.

Elemental Analysis and Dating Brackets

Every white bead analyzed returned traces of *As* and not traces of *F*, *Sn*, or *Sb*. These results indicate that the sampled beads from HR004, HR006, HR188, HR258, DB140, DB142, and 48WA9 were all manufactured between 1850 and 1950. One metal sample from HR188 and HR258 were positive for the presence of *Mn* indicating their manufacture dates to after 1840. Negative samples from HR004 and HR188 do not necessarily indicate a pre-1840 date of manufacture. While *Mn* was only used after 1840 there continued to be *Mn* free ores used in the steelmaking process. The implication being that the presence of *Mn* indicates a later date but the absence provides no temporal information. The results of the white bead and steel artifact analysis helped to further refine our dating brackets while the turquoise bead analysis proved

Table 1.6. Interment Type in Chronological Order.

Burial	Burial Type	Date Range
HR220	Crevice/rockshelter	1700-1803
HR049	Crevice/rockshelter	1700-1880
HR051	Pit Burial	1700-1880
DB143	Scaffold/Tree	1700-1880
HR139	Cairn	1721-1921
FC10-15-08	Crevice/rockshelter	1730-1810
HR019	Crevice/rockshelter	1800-1840
HR020	Crevice/rockshelter	1800-1840
HR132	Crevice/rockshelter	1800-1920
HR056	Pit/Coffin	1825-1868
DB140	Unid.	1840-1880
HR006	Pit Burial	1850-1880
DB142	Crevice/rockshelter	1850-1880
HR004	Scaffold/Tree	1850-1880
48WA9	Unid.	1850-1880
HR188	Crevice/rockshelter	1850-1880
HR258	Crevice/rockshelter	1860-1920
HR015	Coffin/Cairn	1870-1910
FC050	Crevice/rockshelter	1880-1882
DB141	Unid.	1900-1920

inconclusive. The dating brackets developed through an analysis of historic artifacts, bead sizes and colors, radiocarbon dates, and the elemental analysis of glass and steel items allow for an assessment of the relationship between interment style and time (Figure 1.8 and Table 1.6). Still, in many cases the burials were given a wide dating bracket that could not decisively place the burial in the Late Prehistoric, Protohistoric, or Historic period. To compensate for this the burials were place in a continuum from oldest to newest. This allows for a discussion on continuity and change to the burial types over time without being limited by variation in date ranges.

The Burials

HR004. The Torrington burial, HR004, comes from site 48GO6, located on the south bank of the Platte River near Lingle, Wyoming. The exact location of the burial within the larger site is unknown. This burial is believed to be associated with a series of remains recovered in the area during the 1930s (Agogino and Galloway 1963:107; Howells 1938:318). This individual is a female Native American between the ages of 22 and 24 of unknown ethnicity, although associated burials may be of Siouan ancestry, based on cranial metrics (Agogino and Galloway 1963:109; Gill 2000). There is no visible trauma on the skull, although several teeth show evidence of dental carious lesions and the mandibular fossa shows signs of osteoporosis.

This was a scaffold burial dating to after 1850. While the manufacture and use of some artifacts date to the late 18th/early 19th century the presence of a four hole pie crust button, average maximum bead diameters of less than 2mm, a diverse range of bead colors, and the presence of *As* in the elemental analysis of the white beads were used to provide the post 1850 date. This is supported by bead plots which place this burial in subplot #2 and a Reher/Scheiber date of 1887.5. Associated material remains include at least five different types of Euroamerican manufactured cloth, 1458 hot tumbled glass beads consisting of 12 colors, 1 four hole pie crust button, leather strapping with stitching and buckle holes, an iron or steel buckle, 20 brass buttons with alpha loops, fragments of 3 copper bracelets, 24 pigment stained twigs, and one flat polished stone ellipsoid (possibly a hide polishing tool). Bead colors include white, blue, green, red, black, red/white, yellow, clear, light blue, orange, pink, and turquoise.

HR006. The City Springs burial, HR006, from site 48AB6, was discovered in east Laramie in 1968. This individual is a female Native American of unknown tribal ethnicity between the ages of 21-24. The remains exhibit no dental carious lesions or pathological conditions with the exception of a shortened and misshapen metatarsal on the left foot. This condition is possibly the result of localized trauma to the big toe. The injury appears to have healed as the metatarsal began to fuse to the 1st cuneiform. Arthritis is present in the vicinity of the injury. Stab wounds and trophy finger removal also indicate that the individual may have been murdered (Rick Weathermon, personal communication 2015).

The limited number of bead colors, including white, black, and turquoise, and an average maximum bead diameter of over 3.5mm suggests this burial dates to before 1840. Bead plots and the Reher/Scheiber formula support this terminus ante quem date. However the presence of *As* in the elemental analysis of the white beads indicates that this interment occurred after 1850, likely indicating that this burial should be dated closely to the middle of the 19th century when larger Pony beads were being replaced by smaller Seed beads and Sb rich beads were being replaced by *As* rich beads. While the remains were found below ground, the presence of four postholes and associated sticks and bark caused for initial analysis to determine that it may have been a scaffold burial (Frison 1968). However, subsequent evaluations have led to the determination that it was a log lined pit burial (Rick Weathermon, personal communication 2013). Associated burial material includes one complete and three fragmentary copper bracelets, 11 leather fragments, 1239 complete hot tumbled beads consisting of three colors and 177 bead fragments, and one large elliptic piece of red hematite.

HR015. HR015 was recovered from a site in the vicinity of Pryor, Montana near the Crow Reservation. The remains were recovered from a group of looted graves as part of the

Montana Archaeological Survey, a WPA sponsored project, during the late 1930s or early 1940s. The remains belong to a Crow male child between the ages of 3.5 and 4.5 years. These remains consist only of the skull and mandible. While no pathologies or trauma are recognizable, there are dental caries present likely the result of defective tooth enamel (Owsley and Scheiber 1994:1-2).

The burial is believed to date to the late 19th or early 20th century based on the presence of wire nails in the coffin (Mulloy 1941, 1958). The coffin was located inside a stone masonry wall with five other burials, two of which were also in coffins (Mulloy 1941, 1958). All of the burials had been looted. Present items included glass beads, harness straps, and a single potsherd. The association of specific artifacts with individual burials was difficult due to the comingling of burials with each other and surface debris. HR015 was marked by a cairn-like structure (Owsley and Scheiber 1994:1). Associated burial material includes one blue glass hot tumbled bead, an unidentified fragment of cloth less than 4mm square, and a possible burial shroud (Rick Weathermon, personal communication 2015). A date range of 1870-1910 was assigned by University of Wyoming researchers based on artifacts associated with the burial (Owsley and Scheiber 1994:1).

HR019 and HR020. The Pitchfork Rockshelter burials are associated burials from site 48PA42 in Park County Wyoming. The burials were excavated from a rock shelter near Sunshine Reservoir in 1973. Both semi-mummified remains are Crow males. HR019 is between 27 and 35 years of age and HR020 is approximately 25 years of age. Neither partial skeleton shows signs of trauma. HR019 has no visible pathologies, although a small number of dental carries are present. HR020 has no carries but does have two tooth abscesses.

The limited number of bead colors, an average maximum bead diameter of over 3mm, the inclusion into bead Subplot #1, an early Reher/Scheiber date, the presence of shell hair pipes, and a wool trade coat with gold plated brass buttons indicate that the burial dates to between 1800 and 1840 (Scheiber 1994:37). Both remains were primary interments in a small rockshelter high up on a cliff. Individuals were wrapped in blankets and buffalo robes. HR019 was also wearing a wool coat associated with the fur trade and dating to approximately the 1820s (Nottage n.d.). Associated artifacts with HR019 include 3 blown glass beads, 13 lamp wound beads consisting of two colors, 280 hot tumbled beads consisting of four colors, 61 hot tumbled glass bead fragments, five dentalia shell necklace beads, three conch shell hair pipes, three brass buttons with Alpha loops, one wool trade or chiefs coat, and two wool blankets, one of which was a Hudson Bay Point Blanket. Bead colors included white, blue, black, and red/white. HR020 is associated with 5 lamp wound beads, 739 hot tumbled beads consisting of 4 colors and 51 bead fragments, one dentalia shell necklace bead, one wooden bowl, one bison robe, one wool blanket, and one buckskin or calfskin leather garment (Gill 1976:303). Bead colors included white, blue, black, and red/white.

HR049. The Hudson Falls Creek burial comes from site 48BH1853. The remains were recovered north of Shell, Wyoming in the 1920s and donated to the University of Wyoming in the 1970s (Human Remains Repository Files n.d.a:20). The partially mummified remains consist of a left upper torso, arm, and head of a 1-1.5 year old Native American of unidentified tribal ethnicity. The young age and limited set of remains do not allow for a definitive designation of sex, although the pointed chin may indicate this individual was a female (Owsley and Scheiber 1994:4). There are no recognizable pathologies or trauma present on the remains.

The only temporally diagnostic artifact in the assemblage is the probable gold plated brass wire, which was only available on the High Plains after A.D. 1700 (HRR n.d.a:21). Due to this, the date brackets for this burial start with A.D.1700 and end with the removal of the tribes in the region to reservations, approximately 1880. This was a primary interment, based on the mummification and articulation of the remains, in a crevice. Associated artifacts include one oval shell earring strung on the wire. Natural red pigment was found on the head.

HR051. The Fort Benton burial comes from north central Montana from site 24CH82. This site is located on the Missouri River near the mouth of Shonkin Creek in Chouteau County, Montana. The burial was identified and looted by a collector in 1974. The remains belong to a male Native American of unknown ethnicity between the ages of 60 and 70. The north location of the burials may indicate a Kutenai, Flathead, or Blackfoot ethnicity. There are no present dental caries although the individual did have a tooth abscess, osteoarthritis, and a broken and then healed left clavicle. The presence of blunt force trauma to the head and face indicate the individual was likely murdered (Rick Weathermon, personal communication 2015).

There are a number of questions regarding this burial due to the nature of its discovery and excavation. The remains and associated grave goods were initially recovered by collectors in 1974. The human remains have since been integrated into the University of Wyoming, Department of Anthropology Human Remains Repository collection. The artifacts have not been turned over. The site continued to be potted through the 1970s. A state issued site report in 1977 indicates that small pieces of metal, bone, and glass were all that remained of the burial. All of our current understanding of this burial comes from the human remains and a limited set of documentation that recorded data after the initial collection event (Aaberg 1975; Davis 1976; Human Remains Repository Files 1977). The burial has been reported as a stone lined burial pit.

As the artifact collection is in private hands, we do not have a complete list of items associated with this interment. Aaberg (1975) records the presence of Northwest flintlock gun with a hexagonal barrel, a powder horn, glass beads, and "other historic items" in the collection coming from this burial. We do not know what the other items are. Our limited knowledge of the HR051 collection makes dating this burial difficult. Characteristics of the gun itself such as barrel bore, maker's stamps, trigger style, as well as other stylistic qualities could be useful in dating the item. Undoubtedly, the "other historic items" could also be of aid in dating this burial. However, without these items the burial can only be attributed to the Protohistoric or Historic period, from approximately 1700 to 1880.

HR056. The Lingle Burial, HR056, was discovered in 1977. The burial was located east of the Grattan Massacre, a 19th century conflict between native tribes and the United States Military, and 100 yards from the Bordeaux Trading Post, a 19th century trading post in operation during the massacre. The burial contained two individuals, a Native American female between 18-25 years of age and the partial remains of a fetus or newborn of indeterminate sex. No skeletal trauma, pathologies, or dental caries were observed on either set of remains (Basgall 2006:2; Gill n.d.a).The ethnicity of these individuals has been classified as Siouan for two reasons. First the remains were located in close proximity to the Bordeaux Trading post. The owner, James Bordeaux, married into the Lakota Sioux. Second, the remains of the adult female had mummified flesh still attached to the skull. This flesh was painted with a red stripe. This type of red stripe is commonly associated with Sioux Buffalo Women (Basgall 2006:12-13; Walker 1917:149). Sioux Buffalo women are who have undergone the Buffalo Ceremony, a ceremony marking their passage from childhood to womenhood. Buffalo women maintained elevated levels of prestige in social and ceremonial circles (Basgall 2006:10-12).

The individuals were interred in a box described as a "crude coffin constructed of saplings" (Colyer n.d.). The wood associated with the burial was hewn but unfinished with bark still attached to the pieces (Basgall 2006:3). While the presence of hewn logs has been interpreted as indicating a coffin burial, there are in fact other possibilities. The logs could have belonged to a collapsed scaffold, a burial type common to the Lakota Sioux, or from a log picket that was often placed around a burial to protect it from animals (Basgall 2006:15-21). To complicate things further this interment may have been a combination of these burial forms as some remains were placed in coffins and then laid on a scaffold (Bushnell 1927:34). Associated with the burial were 40 beads of unidentified material and manufacture, five additional bead fragments, two steel Sanders style buttons, one unidentified button, and unidentified fabric fragments from three distinct types of fabric. The presence of the Sanders style buttons date the burial to after 1825 when this type of button manufacture was used (Basgall 2006:2; Luscomb 1999:17). Dating can be refined further when one considers the location of the burial and specific attributes of the interment. The association with the Bordeaux Trading post provides date brackets of 1849 to 1868, when the post was in operation. Should the burial be shown to have actually been a subsurface coffin interment the latter end of this range would be more applicable as burials in the ground came into use by the Lakota Sioux after 1860 (Bordeaux 1929:162).

HR132. The Bridger Gap Burial, HR132, was recovered from site 48UT920 in 1985. The site was discovered during mitigation efforts relating to highway construction activities along Highway 189. The remains belong to a Native American female who was over the age of 60 (Gill n.d.b). Craniometrics and other size indicators suggest this individual is possibly of Shoshonean descent (Truesdale and Gill 1987:26). However, the metrics from this sample do not fit squarely into any single tribal affiliation. This individual demonstrates traits found in earlier

prehistoric populations, possibly indicating an affinity with Athabaskan migrations from the north or the movement of native groups up from the southwest, and with other Northwest Plains tribes including the Cheyenne, Blackfoot, Flathead, or Arapaho (Human Remains Repository Files n.d.b:25). However, a Siouan affinity would be considered unlikely (Gill n.d.c). The likely Shoshone identification is based on skeletal metrics and the location of the burial in Wyoming. This individual displayed trauma to the right distal tibia and fibula, arthritic lipping on the spine and longbones, dental carries, and tooth abscesses. The trauma to the tibia and fibula appear to have occurred earlier in life and healed successfully, although the range of ankle motion would have been limited (Gill n.d.c).

This individual was placed in a small crevice, covered with strips of juniper bark, and then covered in large stones. This appears to have been a primary interment consisting of a nearly complete and fully articulated set of remains. The body was flexed and laying on its side, facing south, with the head to the east (Truesdale and Gill 1985:4). Radiocarbon dating of the juniper bark returned an uncalibrated date of 90±60, giving the burial a mean date of 1821±100 years (Human Remains Repository Files n.d.b:25). The preservation of the hide garments, the only artifacts found with this burial, together with the absence of artifacts of Euroamerican manufacture, common in burials from later in the Historic period, seem to indicate that this burial likely falls earlier on this spectrum (Human Remains Repository Files n.d.b:25; Truesdale and Gill 1985:13).

HR139. The Archive's Child burial consists of the remains of a Native American child between 2.5 and 3.5 years old recovered in the 1930s. The remains, recovered from along the North Platte River in eastern Wyoming, consisted of only the cranium. Associated with the cranium is a dress made from printed cotton fabric with 47 glass beads sewn into the neckline.

This was a cairn burial dating to the end of the 19th century or to the early 20th century (Rick Weathermon, personal communication 2012). Dating this burial relies on the average maximum white bead size of less than 3mm and the preservation of the cotton fabric. It is believed that the good preservation indicates that the interment could not have occurred much earlier than the last few decades of the 19th century (Rick Weathermon, personal communication 2012).

HR188. The Nunn burial, HR188, comes from site 48CO1829, a few miles north of the North Platte River. The remains represent a Native American female between the ages of 30 and 39. The remains consist of the skull, pelvis, major long bones, and scapula. This individual had a misshapen right femur and at least one tooth abscess (Gill n.d.d).

This individual was interred in a large rock crevice that was artificially walled at either end (Human Remains Repository Files 2000:7). Included were a large number of items of Native and Euroamerican manufacture. A number of Euroamerican manufactured items including alpha button loops, a glass bottle stopper, glass beads, metal trade points, and a trade knife with a makers stamp helped to date this burial. Some of these items, including the alpha loops and the glass trade beads, indicated that the burial dates to between 1785 and 1840. This early date was supported by the inclusion of this sample in bead Subplot #1 and an early Reher/Scheiber date. This early date would also be supported by the prevalence of items of native manufacture in the assemblage such as shell and elk tooth beads, an antler scraper, and stone tools. However, when the entire artifact assemblage is examined it becomes clear that the burial should be assigned a later date. The presence of a trade knife with a Pierre Chouteau Jr. and Company maker's stamp dates the burial to after 1838, as this is when that organization was in operation. The length of a trade point from this assemblage would seem to confirm this later date. Dating trade points by

length and morphology is a difficult task due to inter and intra tribal variation, native manufacture of points or modification of Euroamerican manufactured points, and repurposing and resharpening of existing tools. Still, it is believed that metal trade points in this region generally became longer through time with points longer than 76mm dating to between 1850 and1880 (Burnett et. Al 2008:5). A trade point from this collection is 92.71mm in length, dating it to after 1850. Finally, the elemental analysis of white glass trade beads and steel artifacts, showing the presence of *As* and *Mn* respectively, support the post 1840 date. In light of the two conflicting data sets it is possible that this interment occurred in the middle of the 19th century when bead sizes and elemental composition were in flux or that the artifacts dating to prior to 1840 were curated items that, while manufactured much earlier, were used alongside newer technologies and items and entered into the archaeological record at the same time.

HR220. HR220 was recovered from the QC5 ranch near Big Twin creek in Sublette county Wyoming in 1996 (Gill and Weathermon n.d.). This was a female Native American 12-15 years of age of unknown tribal ethnicity. The individual was interred in a rockshelter along with four distinct types of leather, over 240 elk tooth beads, cut velvet fragments, silk fibers, and red pigment. Dating the individual was done based on the presence of the velvet and silk fibers but the lack of other Euroamerican goods including buttons and beads. This suggests that the burial occurred during the Protohistoric period but likely prior to the regular movement of Euroamerican trappers and traders into the region after 1803 (Gill and Weathermon 1996:3-4).

HR258. The Sheridan WAS burial was recovered by members of the Sheridan chapter of the Wyoming Archaeological Society in the 1950s or 1960s from the Powder River Basin south of Lodge Grass, Montana (Bergen and Gill 2002; Human Remains Repository Files n.d.c:1). The exact location within Montana is unknown. The remains belong to a young to middle aged adult

Native American male of unknown ethnicity. No major skeletal pathologies, dental caries, or tooth abscesses were noted. The individual did have a broken and healed mid thoracic rib.

This interment was located in a rock shelter. A large amount of cultural material was associated with this burial, some of which was used to help provide dating brackets. Multiple buttons with Sanders shanks were present, placing this burial after 1825. The presence of three mass produced brass safety pins dates the burial to after 1849, when the patent was obtained by Walter Hunt. The fact that the pins appeared mass produced likely places these items after 1860 (Human Remains Repository Files n.d.c:5). Two piece military buttons with brass fronts and iron backs bearing makers marks and gold wash on the front were also recovered. These buttons had soldered Sanders style shanks and a raised decoration on the front depicting an eagle and a shield. These types of buttons were manufactured between 1848-1864. Finally a white glass collar stud places this burial between 1860 and 1920 based on fashion trends during that period (Human Remains Repository Files n.d.c:7-8). Diverse bead colors, an average maximum bead width of less than 3mm, bead plots, the Reher/Scheiber date, and the presence of *As* and *Mn* in the bead and metal elemental analysis support a post 1840 date for this burial.

DB140, DB141, DB142, and DB143. The cultural materials from DB140, DB141, DB142, and DB143 have no associated human remains. These collections come from what HRR files refer to as Don Gray's Footlocker. Don Gray was associated with the Wyoming Archaeological Society who donated this material after his death in1996.

DB140, designated as PROB-756 by HRR staff on the associated tag, is believed to have come from west of Chalk Butte, southeast of Indian Flat Surface. This places the burial in southeastern Montana. The age of the individual, the date of the burial, and the style of burial are all unknown. Twenty nine hot tumbled glass beads make up the assemblage associated with this

burial. Bead colors include white, yellow, pink, light blue, and blue. Variable bead colors, an average maximum bead diameter of less than 3mm, bead plots, the Reher/Scheiber date, and the presence of *As* in the white beads indicate that this burial dates to after 1840.

DB141 was designated as PROB-757 on the associated tag. This burial is believed to have come from near Lame Deer, Montana. This interment was believed to be an infant Cheyenne dating to approximately 1910. The type of burial was not recorded. Six glass beads comprise the assemblage associated with this burial. Bead colors are blue or white.

DB142 was designated as PROB-807 on the associated tag. This was a cliff burial from northeastern Wyoming, likely north of Sheridan. The associated notes indicate that the remains came from Barbula's place near the Montana line on the Tongue River. The age, tribal affiliation, and date of this burial are unknown. This assemblage consists of 459 hot tumbled glass beads, eight hot tumbled glass bead fragments, one wound glass bead, and one molded glass bead. Bead colors include turquoise, yellow, pink, red, white, red/white, blue, and black. Variable bead colors, an average maximum bead diameter of less than 3mm, bead plots, the Reher/Scheiber date, and the presence of *As* in the white beads indicate that this burial dates to after 1850.

The Prairie Dog burial, DB143, is recorded as having come from near the "Lower Prairie Dog". This is likely the Lower Prairie Dog creek in northern Wyoming, north of Sheridan. No information on the age or tribal affiliation of the individual associated with this burial is available. The notes do indicate that this was a tree burial. There are three hot tumbled beads in this collection. Their average size indicates they may date to before 1840, a point supported by a very early Reher/Scheiber date. However, their colors, blue and red, may indicate a later date of

after 1840. Unfortunately a sample of three beads is not enough for one to draw dating inferences for this burial.

FC050. The Marbleton Mummy burial, FC050, comes from site 48UT886. The burial was discovered near the town of Lonetree, Wyoming in 1983. These remains are from a Native American male between 24 and 30 years of age of Shoshonean descent (Gill n.d.e). The designation of Shoshone comes from cranio-facial metrics and the presence of a "checkered-diagonal" bead pattern on moccasins found with the burial (Gill 1984; Kroeber 1907:154). The mummified nature of the corpse made the identification of skeletal trauma or pathologies difficult, and none were evidenced. No dental carries or tooth abscesses were recorded.

The Marbleton Mummy was interred in a crevice and covered with juniper branches (Ottman 1992:4). This was likely a primary interment as most of the skeleton was present. Accompanying this burial was a large amount of cultural material including but not limited to: a saddle, a knife and sheath, a .22 caliber revolver, .45-70 rifle cartridges, beaded moccasins, blankets, beads, and other metal and glass items. Unfortunately this site was discovered by looters who removed both the associated grave goods and the remains themselves (Ottman 1992:4). As a result the context of the items in the collections today was corrupted and items originally associated with this individual have undoubtedly been lost. Still, the material that is present was able to provide date brackets for this burial. The presence of ten .45-70 rifle cartridges date the burial to after 1879 providing a likely date range of between 1880 and 1882 for this burial (Gill 1984).

48WA9. The Spring Creek Cave burial was recovered by George Frison in the 1940s or 1950s near Spring Creek Cave, on the western face of the Bighorns (Rick Weathermon, personal communication 2015). There is no recorded information on the age, sex, or ethnicity of the

individual or the type of burial. While there are no human remains associated with this accession, there is cultural material. A polished and worked antelope horn, and a worked piece of wood, leather fragments, wool and cotton fabric pieces, glass beads, and native fibers are included in the 48WA9 burial. Bead colors include red/white, yellow, black, dark blue, turquoise, pink, clear blue, white, and blue. Limited information makes dating 48WA9 difficult. Variability in bead colors, bead plots, the Reher/Scheiber date, and an average max bead width of 2.19mm dates the burial after 1850.

FC10-15-08. The Baby Doe burial was recovered in 1988 in the Beaver Creek area near Shell, Wyoming. The accession contains the remains of an individual between 1.7 and 2.3 years, possibly male. The individual appears to be of mixed Euroamerican and Native American descent. FC10-15-08 was a crevice burial. Associated with the burial were 11white glass beads and a cloud blower steatite pipe fragment. Limited bead colors, bead plots, the Reher/Scheiber date, and a maximum diameter of 3.73mm indicate a date of prior to 1840. This is supported by a radiocarbon date of 210±40, giving the burial a calibrated date range of 1730-1810 (Beta Analytic 2010).

Synthesis. The results of analysis of interment type reveal one cairn, one coffin/cairn, two scaffold/tree, two pit, one pit/coffin, three unidentified, and ten crevice/rockshelter burials. Of the 20 burials examined two had Euroamerican forms, HR015 and HR056, while 15 had distinctly Native American burial forms. The Euroamerican and Native American associations of the accompanying burial goods were also examined (Figure 1.9 and Appendix A). Appendix A provides a list of associated funerary objects from each burial while Figure 1.9 demonstrates the breakdown of the percentage of artifact types per burial based on data in Appendix A. This graphic uses artifact types rather than pure artifact counts to track the distribution of

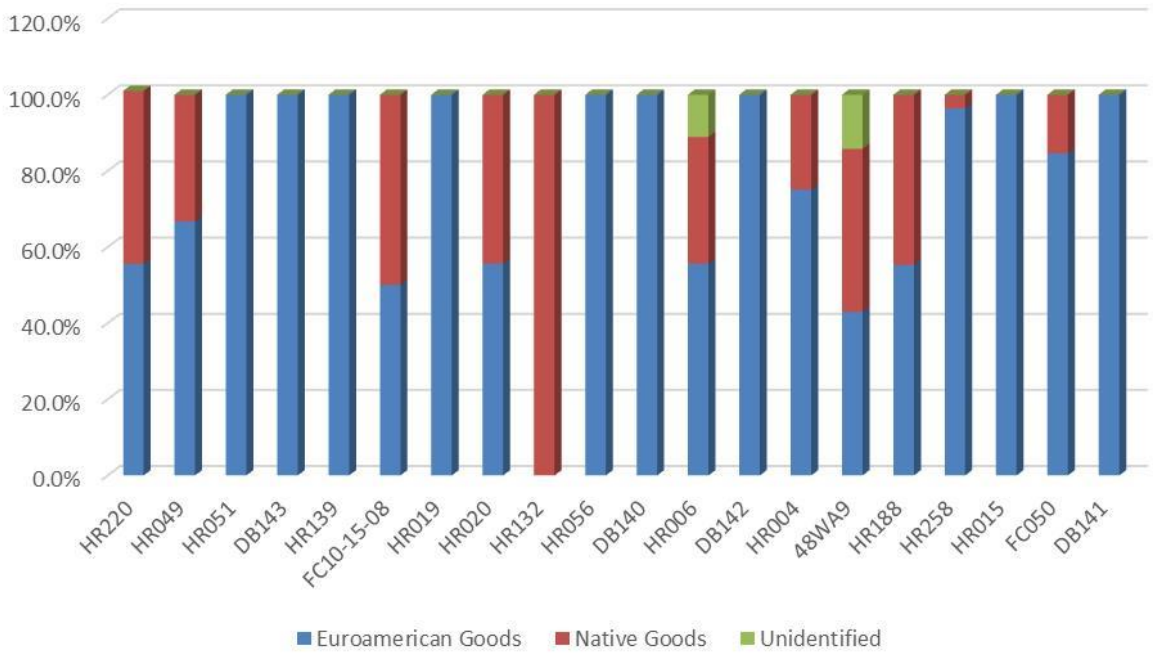

Figure 1.9. Percentage of native and Euroamerican artifact types.

native/Euroamerican materials for a number of reasons. This method compensates for the fragmentation of artifacts in the archaeological record. A single piece of fabric or leather strapping will break down over time resulting in a single artifact being represented in the present as two to hundreds of fragments. If raw artifact counts were used fragments from a single native or Euroamerican artifact could cause for the over- representation of either period in this analysis. Artifacts such as beads and buttons can result in the same problem as they are often used for a single purpose and come from a single artifact, such as a single piece of beaded clothing. Hundreds of beads in the archaeological record can come from one piece of historic beadwork or multiple buttons can come from a single piece of clothing again causing a single artifact to result in the over-representation of a period. The analysis of differential burial good types shows that of

the 20 burials two contained only native artifacts, eight contained only Euroamerican artifacts, and eleven had items of both Euroamerican and Native American manufacture.

Late Prehistoric Regional Burial Trends

The most recent synthesis of regional burial trends comes from Laura Scheiber's 2008 work, *Life and Death on the Northwestern Plains.* This analysis examined 39 burials from Wyoming, Montana, western Nebraska, and northern Colorado dating to the Late Prehistoric period. Burials contexts were classified as crevice/rockshelter, mound/cemetery, isolated, and other. Isolated interments consisted of individual pit burials, campsites, or cairn burials. Context for other burials was not identified. Fifteen of the burials were located in crevices or rockshelters, 19 were isolates, and five were classified as other. Associated artifacts include stone tools, including diagnostic point types, items of personal adornment, clothing, and burial wraps.

Late Prehistoric burials represent a shift from previous periods. The frequency of crevice/rockshelter burials increases sharply from the Woodland period, form 6.2% to 38.5%. There is also a shift in the type of funerary objects. Burials from previous periods tend to have few diagnostic artifacts. This is not the case in Late Prehistoric period interments, where time sensitive materials are more frequently included (Scheiber 2008:34). The shift towards crevice/rockshelter burials has been postulated as being indicative of increased habitation near escarpments, the need to hide individuals from others, or a preference for placing burials near the sky (Scheiber 2008:34).However, as escarpments are diverse ecozones they tend to be natural draws for human habitation the latter two explanations may be preferable. Changes in interment

type and associated grave goods support the thesis that, based on the introduction of new ceramic and lithic point types to the region, new groups were moving into the region.

Protohistoric and Historic Tribal Burial Forms

Some of the groups migrating into the region during the Late Prehistoric and Protohistoric periods were the Lakota Sioux, Cheyenne, Crow, Arapaho, and Shoshoni. An investigation of the traditional burial practices of these groups is necessary to provide a firmer foundation upon which to base our analysis. Archaeological data as well as tribal oral histories drawn from historic and ethnographic sources were used to recreate burial practices for the aforementioned tribal groups from the Late Prehistoric into the Protohistoric period.

Proto Siouan groups, after A.D. 1300, began to bury their dead in large mound centers. As tribal subsistence and settlement practices shifted, so too did their interment strategies. By the end of the Late Prehistoric the Lakota Sioux were practicing tree and scaffold burials whereby the body was painted, dressed, and bound in robes or blankets and placed on the elevated platform. Personal items including weapons were often interred with the deceased. The practice of scaffold burial persisted among the Lakota Sioux into the 1870s. There is also reference to the use of crevice burial for women (Barber 1877:202-203; Catlin 1973:10; Gibbon 2003:43; Hassrick 1964:37, 335-337; Hilger 1952:162-163; Humfreville 1897:94, 181-182; Snortland 1994:52; Yarrow 1880: 63-64, 70-71; Yarrow 1881:107-108, 158). While Lakota interment strategies were variable through time, the inclusion of grave goods was not. Archaeological data indicates that the practice of placing items such as ceramic vessels, shell gorgets, stone pipes, shell and bone beads, and stone tools in burials began with proto Siouan groups in Minnesota

prior to A.D. 1300 and continued through the Late Prehistoric, Protohistoric, and Historic periods as the Lakota began to push west onto the plains (Arzigian 2008: 137-138; Birk 1977:31; Howard 1968:135; Lugenbeal 1978:51; Syms 1979:283).

The Cheyenne transitioned from subsurface burials, some under mounds to tree and scaffold burials by the end of the Late Prehistoric. Archaeological evidence reveals that the practice of placing grave goods such as bone tools, beads, and items of personal adornment, antler tools, shell beads, ceramic vessels, and red ochre in burials began with proto Cheyenne groups in Minnesota prior to A.D. 1300 and continued into the Late Prehistoric, Protohistoric, and Historic periods as the Cheyenne began to move westward onto the plains (Jenks 1932:456; Johnson 1962:163; Ossenberg 1974:29; Snortland 1994:51; Wilford 1955:137-138). The later burials saw the individual dressed in their finest clothes and bound in furs, blankets, or shawls. Often the individual would be interred with their personal effects with a horse being shot near the burial. Into the reservation period many of these traits persisted. In the post-reservation period individual were frequently buried, sometimes in a formally designated graveyard. Still the individual was dressed, wrapped, and interred with their personal effects (Hilger 1952:163; Hoebel 1978:92-93; Voth 1893: 96-99).

In the Rocky Mountains and High Plains regions there were two primary divisions of the Crow prior to 1850. The Mountain Crow occupied the Bighorn, middle Yellowstone, upper Tongue, and Powder Rivers and ranged into the Bighorn, Absaroka, Beartooth, and Wind River Mountains. The River Crow occupied the lower Yellowstone, Marias, and Milk river regions. After 1850 a third a division of the Crow appeared, the clan based Kicked in the Bellies, who lived in central to northern Wyoming (Lowie 1912:183-184; Voget 2001:695). While there were geographic differences and undoubtedly differences in the tribal groups each Crow division was

in frequent contact with, the Crow essentially remained one people sharing cultural customs and beliefs (Lowie 1983:4). This is likely the reason many sources do not differentiate between Crow divisions when discussing burial practices. The Crow also practiced tree and scaffold burials. On some occasions the deceased would be removed from the platform once the flesh had decomposed and placed in a crevice or rockshelter. Individuals were painted, dressed in their finest cloths, and wrapped in furs or blankets prior to interment. Personal items would be placed in the bundle or on the burial platform and a horse was sometimes shot near the grave. Lowie (1983) also reports that a fifth pole may be erected next to the scaffold upon which a warrior's drums, rattles, or sashes would be hung. Scaffold and tree burials persisted into the reservation period although subsurface burials were also seen (Curtis 1909:179; Lowie 1983:66-68, 162, 168, 179, 195-196, 226-227, 332; Parker 1902:94-96; Voget 2001:704).

Arapaho burials differ somewhat from Lakota Sioux, Cheyenne, and Crow practices in that they did not use tree or scaffold burials. The Arapaho buried their dead below the surface of the ground with a covering of cacti, brush, and twigs over the grave; placed the deceased in rockshelters; or placed individuals on hillsides and covered them with rocks. Before burial the dead were painted red, dressed in their finest cloths, and wrapped in furs or blankets. Personal items, with the exception of weapons, were placed in the grave and a horse would be shot nearby. In some instanced a pole was placed near the head of the grave and the deceased's war shield was hung there (Fowler 2006:30; Hilger 1952:162-164, 228; Kroeber 1904:11, 228; Kroeber 1983:16; Michelson 1933:606; Voth 1893:96-98).

Various Shoshone groups used a range of burial practices including cremation, subsurface interments, and crevice or rockshelter burials. The Shoshone in this region appear to have favored crevice/rockshelter burials. Individuals were painted, dressed in their best cloths,

and wrapped in blankets prior to burial. Personal effects would be placed with the individuals and a horse may be shot in the vicinity (Lowie 1909:214-215; Lowie 1924:278-282; Shimkin 1986:308; Trenholm 1964:29, 66-67). Archaeological data reveals that the Shoshoni practice of placing goods such as bone beads and stone tools in burials dates to at least the Late Prehistoric period (Grey 1963:99-101; Miller and Gill 1980:235).

DISCUSSION AND CONCLUSIONS

The investigation of the 20 burials dating to the Protohistoric and Historic periods was undertaken to examine the manner in which the introduction of Euroamerican goods impacted indigenous burial practices. When approaching issues relating to continuity and change such as this, one needs to be explicit in defining what constitutes "change" and what is indicative of "continuity". Undoubtedly an analysis of any culture over time will reveal some level of change. In fact this is to be expected. Cultures change, they are not static entities. This is a point that is made in Introduction to Cultural Anthropology textbooks and classrooms nationwide. Likewise, there are components to culture which are considered "traditional". These are cultural traits that persist, or are believed to have persisted, over an extended period of time.

The introduction of new technologies and materials into indigenous systems indicates a point of departure from traditional activities for indigenous populations. However, the purpose of this study is not to focus simply on technological change but rather to investigate how this technological change was integrated into existing cultural practices. Furthermore, this paper

looks to understand how the integration of these technologies acted as an agent of larger cultural change or were used as a means of reinforcing existing cultural traditions.

Traditionally Native American archaeological contexts containing Euroamerican goods have been interpreted as reflective of enculturation or assimilation by indigenous populations (Rubertone 2001:xii). More recently investigators have found that in many cases Euroamerican goods were integrated into native contexts in ways that fit pre-existing ideological and social structures (Prince 2002:52). In doing so these items could be integrated into indigenous sacred traditions and given new native meanings (Hodge 2005:13; Rubertone 2001:140).

As was discussed earlier, in the High Plains and Rocky Mountain regions of the West where early Native American/Euroamerican interactions revolved around the fur trade one would expect to see relatively fewer changes in native cultural practices, such as mortuary contexts, as Euroamerican influence, power, and controlling mechanisms were not well established. Still, the changes some have suggested occurred to socio-political organization and social stratification brought about by fur trading activity and access to Euroamerican goods could be reflected in mortuary contexts. The increase in Euroamerican influence after 1840 through heightened emigration, militarization, missionization, and settlement of the region would only exacerbate changes in mortuary contexts began in the fur trade era.

Analysis of the Study Sample

An analysis of our test sample reveals burial traits that show continuity through time as well as the influx of new burial traits with the onset of the Protohistoric period. The following discussion will attempt to draw meaning from these similarities and differences.

The burial forms recorded in this study's sample compare favorably to Scheiber's (2008) analysis and with the expected Late Prehistoric burial forms such as crevice, rockshelter, scaffold/tree, pit, and cairn used by the Lakota Sioux, Cheyenne, Crow, Arapaho, and Shoshoni. With the exception of the coffin burials every other interment with an identified burial form matches the tribal sample. Furthermore the large number of crevice/rockshelter burials, 45% of the sample, meets the expectation that Scheiber puts forth that these burial forms increased dramatically in the Late Prehistoric into the Protohistoric period. Of interest is the apparent under-representation of scaffold/tree burials. The Lakota Sioux, Cheyenne, and Crow all practiced this type of interment, however this sample only includes two scaffold/tree burials. While it is possible that this type of interment fell out of favor through the Protohistoric period this seems unlikely as there are numerous contemporary references to scaffold/tree burials as late as the reservation period (see Barber 1877:202-203; Humfreville 1897:94; Lowie 1983:66-68, 162, 168, 179, 195-196, 226-227, 332; Parker 1902:94-96; Schoolcraft 1851:356; Snortland 1994:52; Voth 1893:96-99;Yarrow 1880:66-67, 70-71; Yarrow 1881:158, 161-165). It seems far more likely that these burials have been lost to decomposition and/or looting prior to their documentation (Scheiber 2008:37) and/or are under identified due to the removal of human remains for secondary interments.

The pit burials, while anomalous to our sample, do not appear to reflect a Euroamerican influence on native burial practices. Sample HR006 was a log lined burial pit located in east Laramie. This burial dates to between 1850 and 1880. HR051 was a stone lined burial pit located near Fort Benton, a prominent trading post in Montana. This burial dates generally to the Protohistoric/Historic periods from A.D. 1700 to A.D. 1880. Log and stone lined burial pits were not referenced by Scheiber as being common in the Late Prehistoric nor were they commonly

used burial forms for the tribal groups discussed in this study. However, there is reference to the use of pit burials by native inhabitants of the region during the Archaic, Woodland, and into the Historic period (Charles Reher, personal communication 2014; Scheiber 2008:30, 32). Additionally, proto-Siouan and proto-Cheyenne populations living west of the Great Lakes are recorded to have regularly used pit burials. This leaves open the possibility that this burial form persisted into the Late Prehistoric period. Pit burials may have also been an alternate interment forms used by the Crow, Arapaho, or Shoshoni. Every native group examined in this study showed variability within their own burial practices allowing for the incorporation of burial forms that were not frequently used or may not have been considered traditional.

Finally, the pit burials may also have belonged to tribal groups other than the Lakota Sioux, Cheyenne, Crow, Arapaho, and Shoshoni. While these were the prominent groups in the region during the Protohistoric period there were a number of other groups such as the Blackfeet, Assiniboine, Atsina, Kiowa, and Plains Apache that migrated through and visited the area between A.D. 1700 and A.D. 1880 (Scheiber 2008:35).

Regardless of which of these scenarios is in fact correct, the most important thing of note is that the use of log and stone lined burial pits with the inclusion of associated funerary material is not a burial style traditionally associated with Euroamerican interments. Euroamerican interments during the 18th and 19th centuries generally consisted of individuals washed and placed in a linen shroud, placed in a wooden coffin, and buried below the surface of the ground. A stone or wooden marker was placed at the head of the burial to mark the grave. Generally the bodies were aligned east to west and in settled areas the deceased were interred in formally designated spaces such as cemeteries (LeeDecker 2009:142-145). The use of stone or log enclosures and the absence of a formal grave marker deviate from traditional Euroamerican

burial forms. This indicates that while pit burials may not be a common burial form for the tribes included in this study, it is likely a native burial form rather than a Euroamerican one.

The use of coffins in burials HR015 and HR056 would also be considered anomalous to our sample. HR015 was located near the Crow Reservation in Montana and dates to between 1870-1910. HR056 was located near Lingle, Wyoming and dates to between 1825 and 1868. The presence of coffins in these burials clearly indicates the adoption of at least some Euroamerican burial forms. However, the association of a cairn above HR015 and associated funerary objects with both burials point to the adherence to some traditional native burial traits. Transitional burial types should not be considered unusual as a number of contemporary references discuss the incorporation of coffins into scaffold/tree burials or the practice of placing individuals in coffins on the surface of the ground surrounded by stones (Parker 1902:96; Voth 1893:96-98). Even as these traits were incorporated into native burial systems other traditional practices, such as binding the body in furs or blankets and interring items with the deceased continued. Additionally, at least in some instances, the traditional mourning rituals were also maintained (Parker 1902:95).

When looking at this sample, analyzing the manner in which distinct burial types are distributed through time is untenable, with the exception of crevice/rockshelter burials, due to the limited number of each type. Crevice/rockshelter burials can be found across the range of our study period with crevice/rockshelter burials coming as early as the 13th century and as late as the 1880s or possibly even into the 1920s. The individual dates for each crevice/rockshelter burial reveals that this traditional practice began prior to the Late Prehistoric and was in use into the 20th century. Other traditional native burial practices including tree/scaffold, cairn, and pit burials also ranged across this time span dating to as early as 1700 and as late as the 1920s.

Euroamerican burial forms do not appear in this sample until the middle of the 19th century. It was during this period when the United States government exerted an increasing amount of jurisdictional control over this region, made possible by the military in the area after 1850. The United States, through treaty and military force, were actively relocating Native American groups to reservations. Once on the reservation the tribes were encouraged to adopt more "American" ways of life. This processes actively sought to compel the tribes to embrace Euroamerican agricultural lifeways, reorganize their tribal government to more closely fit that of the United States, and to embrace Christian holy symbols, rituals, and marriage customs (Gibbon 2003:119). Prior to this, the American government had little ability to compel native cultures, not residing in or near military outposts, to adopt Euroamerican cultural practices.

Like interment styles, the examination of associated funerary material also reveals native and Euroamerican traits. Clearly the introduction of metal, glass, and Euroamerican fabrics into native burials represents a deviation from previous periods. However, the integration of these goods can also be seen as a continuation of traditional tribal practices dating back centuries. The practice of placing items in native burials was common prior to Euroamerican contact and continued during the Protohistoric and Historic periods (Hodge 2005:1). On the High Plains and in the Rocky Mountain regions of the West the use of grave goods such as point types, ceramics, and beads dates to at least the Late Archaic (Scheiber 2008:30-33). Proto Siouan and Cheyenne cultures placed items in the graves of their deceased as far back as 1400 A.D. While there was variation in the nature of associated funerary objects between cultural groups, with a range of utilitarian and ornamental grave goods being found, the practice was widely employed (Arzigian 2008:137-138; Birk 1977:31; Howard 1968:135; Lugenbeal 1978:51; Snortland 1994:51; Syms 1979:283; Wilford 1941:243-244; Wilford 1955:137).

While Euroamerican artifacts were new to indigenous burials, in many cases they represent the same functional types seen in native interments in the Late Prehistoric period and earlier. Identifiable artifacts from this sample include wool, cotton, flax, and silk clothing and fabric fragments along with buttons and buckles associated with article of clothing; items of personal adornment such as glass beads and copper bracelets; iron and steel tools; weaponry such as guns, powder horns, cartridges, and steel knives and points; leather saddles and associated leather, brass, and steel bridle components; Euroamerican pigments; metal spoons; a lead bead; and pipe fragments. These represent functional types such as tools, weapons, clothing, and items of personal adornment which were used as funerary objects in previous periods.

When considering the functional type of the particular grave goods included in these burials, rather than focusing on the manufacturing origin, it would appear that the presence of these Euroamerican goods represents a continuity with previous periods as similar items, albeit with different methods of manufacture, continue to be used. This practice is not without precedent. Items such as beads had pre-existing analogues such as color and shape with pre contact native goods (Jordan 2009:35-36). Vitelli (2011:179-180) finds that even in the absence of a discernable pattern in the distribution in the material and shape of beads they still represent "ethnographically derived traditional patterning" of behavior. This behavior belies a continuity in practice and belief among native groups whereby foreign items are integrated into native networks and given indigenous meaning akin to that of their native analogues. In other instances items such as tools, weapons, and kettles were reworked to duplicate native forms representing a reworking of not only the material object but of the use, conceptualization, and meaning of the item as well (Jordan 2009:35-36). In burials, specifically, the practice of wrapping and binding the body persists through time although the material of the wrapping itself transitions from native

manufactured furs in the Late Prehistoric to Euroamerican manufactured cloth in the Historic period. In all of these instances we see the continuation of native practice even as there is variation in the manner of the physical expression of the ritual or activity.

Materials and Meanings

In the examination of native burial assemblages the real focus then is not simply on the presence of an artifact but rather the manner in which this item is perceived and used by an indigenous population. Analysis of the inclusion of Euroamerican goods in burial contexts from the Eastern United States from the Late Archaic through European contact find that glass beads, and brass, copper, and tin items were equated by native groups with marine shells, native copper and silver, rock crystals, and colored stones. These native items were believed to be connected to the supernatural (Gosden 2007:172-173; Hamell 1983, 1987; Miller and Hamell 1986). Due to the perceived connection between Euroamerican brass, copper, tin, and glass items to native metals, shells, and minerals the items of Euroamerican manufacture were integrated into native belief systems and conceptualized in similar ways as their native counterparts.

It has been postulated that Euroamerican items that were imbued with spiritual significance were so important that native groups would have selected these materials over utilitarian goods when trading (Bradley 1987; Hamell 1992). While scholars can debate the merits of this hypothesis they cannot deny that large numbers of non-utilitarian items such as beads and Euroamerican pigments were traded for by Native American populations in the West. Furthermore, these items along with other Euroamerican utilitarian artifacts were placed in numerous Native American graves during the Protohistoric and Historic periods. Rubertone

(2001:140) finds that burials allow researchers to examine how native groups "incorporated goods into their sacred traditions and used them with more traditional objects to identify connections to kin and community". To this point, based on the analysis of our sample this study finds that it is likely that the presence of Euroamerican items in these graves indicates that these articles served the same ritualistic or spiritual purpose and contained the same cultural meaning that their native analogues did.

This position is strengthened when one considers that in some cases items of Euroamerican manufacture are found alongside items of native manufacture in the same burial. This sample included shell beads, hair pipes, and necklaces; stone hide polishers; fur robes and native leather fragments; elk tooth beads; antler scrapers; bone beads; native pigments; stone scrapers and bifaces; beaded moccasins; and worked antelope horn. The presence of Native American manufactures items indicates that indigenous materials and technologies continued to not only play a role in cultural practices but also maintained some level of importance in burial beliefs and rituals. In some instances similar Euroamerican and Native American functional types, such as shell and glass beads, will be found in the same burial. This would seem to indicate that while modern archaeologists may draw a distinction between Euroamerican and indigenous items, the tribes did not. It was the item itself that had value to it. Tools, weapons, items of personal adornment, and other funerary objects were imbued with religious, spiritual and likely personal meaning regardless of their origin. The continued use of native items alongside newer Euroamerican goods again represents continuity in native religious belief, in this case coupled with the adaptability of religious practice.

Native Adaptability and Cultural Continuity

Adaptability of native systems, which is often referred to by researchers as change in indigenous practice should not be considered unusual. Often when researchers discuss "traditional" indigenous practices they are in fact referring to an idealized native lifeway. In the West "traditional" generally references the Plains horse cultures that thrived from the 17th and 18th centuries until the mid-19th century. However, an examination of ethnohistoric, archaeological, and native oral historical sources indicates that the Lakota Sioux, Cheyenne, Crow, Arapaho, and Shoshoni have not been High Plains bison hunters for the entirety of their existence and that the settlement and subsistence practices of these groups shows variability through time. The same is likely true for native religious practice.

The analysis of our sample has shown that, in this region, Euroamerican materials and burial forms were integrated into and combined with indigenous interment practices in culturally creative ways. In fact this adaptability is considered by some to be a primary component of Lakota Sioux religious practice whereby core concepts would remain the same for long periods of time even as rites and customs were adjusted to meet changing circumstances (Gagnon 2011:6; Gibbon 2003:132; Pond 1986:86). This type of persistence through adaptability is reflected in the burial assemblages of the other High Plains tribes from our sample.

A Re-assessment of Native Burial Practices and Belief Systems

This study does not to seek to claim that native religious belief and practice was static for more than 300 years. Rather, it looks to show how even as new items, practices, and ideas were integrated into native religious belief these religious systems continued to reflect indigenous

worldviews and cosmologies. Harrod (1995) finds that cultural continuity was maintained through shared worldviews and common religious practices that were group specific. In fact the maintenance of cultural institutions was made possible through a shared understanding of religious tradition and ritual practice which had the ability to reinterpret a group's cultural identity. Religious belief, often through the guidance of religious specialists within a society, provided a culturally approved manner of responding to the introduction of new items, ideas, or individuals or dealing with external climatic, demographic, or political pressures. The chosen method of response to such external stimuli, be it outright rejection, adaptation, or wholesale adoption could be viewed by members of a cultural group as in continuity with their self-understanding of their society, as the actions had been sanctioned religiously. In many cases these reinterpretations led to the expansion of a particular tradition rather than massive cultural corruption. In Lakota culture the gift of the holy pipe appears to have deep prehistoric roots although the practice persisted into the Historic period even as it was adjusted and manipulated to meet the changing circumstances of the Lakota as they moved west (Gibbon 2003:133). Other religious and ritual practices of the Plains tribes such as the Sun Dance and the use and importance bundle complexes also saw intensification and expansion of use in the contact era (Ewers 1961:202; Harrod 1995:14; Lewis 1942:35-36; Secoy 1953:90).

Native Communities and Issues of Continuity and Change

Lowie states that (1983:xxii) "Aboriginal peoples have borrowed from one another for thousands of years, and the attempt to isolate one culture that shall be wholly indigenous in its origin is decidedly simple minded". Unfortunately academic investigations, governmental policy,

and public opinion often view native groups and issues related to indigenous/American interactions in relation to a population's "nativeness", or how closely a culture resembles perceptions of "traditional" native lifeways. However, this is neither a fair nor productive means of examining native cultures. Silliman (2009:226) finds that change and continuity are different sides of the same coin. That is to say that change is a necessary function of maintaining any cultural system. It is a manner of dealing with internal and external events and stimuli. Often changes that come as a result of these processes are internalized by members of a cultural group as being in line with their cultural traditions, standards, and cosmologies, a finding that supports Harrod's conclusions.

From this perspective the incorporation of items of Euroamerican manufacture into native political and social institutions could take many forms. Euroamerican items could be imbued with native spiritual significance, they could be repurposed for indigenous use, and in the case of tools and/or weaponry they could function to ease native subsistence all without dramatically corrupting or changing indigenous worldviews or cultural systems (Binnema 2001:114-115; Silliman 2009:226). This is due to the fact that the consumption of Euroamerican goods was a creative and culturally specific process whereby inanimate objects were transformed from simple commodities to elements of a given culture, an issue represented through the re-appropriation and integration of many items of Euroamerican manufacture in our burial sample (Appadurai 1988; Becker 2005:764; Forte 2001:211).

A comprehensive analysis of the datasets included in this study generally supports the conclusions reached in similar research projects investigating native mortuary contexts from North American (Hodge 2005; Prince 2002; Rubertone 2001). The continuation of traditional interment styles, the use of Euroamerican items in traditional native roles, and the use of

Euroamerican items alongside their indigenous analogues into the Historic period belie a use pattern whereby new goods were incorporated into indigenous burial practices through a process that gave them native meaning while using them in native ways. The inclusion of new Euroamerican goods represents a superficial change to native cultures. However, deeper analysis shows that these goods were integrated and understood by native people with the aid of existing cultural institutions which allowed for the development and maintenance of existing cultural systems and practices through a sanctioned process of adaptation and renegotiation. The end result of which allowed native cultures in the High Plains and Rocky Mountain regions of the West to internalize change while simultaneously maintaining existing cultural institutions and a cohesive concept of their native identity from the Late Prehistoric through the modern era.

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CHAPTER 2

EXAMINING BUTCHERING AND TRANSPORT PRACTICES AT THE VORE SITE DURING THE LATE PREHISTORIC, PROTOHISTORIC, AND EARLY HISTORIC PERIODS

This paper will continue the investigation of the impact that Euroamerican goods had on indigenous systems prior to the movement of large numbers of Euroamericans into the High Plains and Rocky Mountain regions of the West through an evaluation of native subsistence during the Late Prehistoric, Protohistoric, and Historic periods. This study will build on the analysis of the previous section which through an examination of burial contexts in the High Plains and Rocky Mountains found there to be a general continuity in indigenous burial practice across the region from the Late Prehistoric into the Historic period. Indigenous subsistence will be examined through an analysis of bison procurement and butchering practices at the Vore Site. The Vore site was a bison jump used a minimum of 22 times between approximately 1500 and 1800 A.D (Reher and Frison 1980:xii, 53-59). Site use stretched from the Late Prehistoric into the beginning of the Historic period, allowing for a comparative assessment of bison procurement and butchering strategies from one location over an extended period of time. The use of this site also predates the wholesale movement of Euroamericans into the region, allowing for the investigation of the interplay between Euroamerican goods and technologies and indigenous subsistence practices prior to the increased influence of Euroamericans themselves.

As early as A.D. 1500 indigenous populations living in the Great Lakes and Great Basin regions of North America began to migrate west and northeast respectively onto the Northern, High, and Great Plains. These migrations occurred during a phenomenon known as the "Little Ice Age", a 200 year environmental episode resulting in cooler and wetter conditions in parts of North America (Reher and Frison 1980:40). These environmental conditions improved foraging capacity for bison resulting in larger, more densely distributed herds (Bamforth 1988:74). Changes to bison ecology ultimately led in improved bison foraging for native groups across the plains resulting in an increase in bison hunting activities by mobile and semi-sedentary populations alike (Sutton 2004:3). As part of this process bison hunting came to be central to the subsistence of tribal groups such as the Lakota Sioux, Cheyenne, Arapaho, Crow, Kiowa, Plains Apache, and Shoshoni (Carter 1938:75; Fowler 2006:1-8; Fox 1976:3; Frey 1987:12; Frison 1967a:1, 226, 232; Gagnon 2011:2; Gibbon 2003:4, 77; Grinnell 1972:13; Leonard 1839:163; Lowie 1924:199; Madsen 1980:19; Mooney 1896:954; Smith 1925:47; Trenholm and Carley 1964:17; White 1978:4-5). Beginning in the 17th or 18th centuries Euroamerican goods, including the horse and gun were brought into the region by these groups via existing indigenous trade networks (Binnema 2001:89, 91; Ewers 1954:3). The result was the culmination of the Plains horse culture. This cultural complex is characterized by a mobile lifestyle relying heavily on bison hunting, increased levels of political integration, and a highly developed warrior culture invested in warfare and raiding to gain social status and prestige (Fox 1976:5-7; Madsen 1980:18; Secoy 1953). On the High Plains the Lakota Sioux, Cheyenne, Arapaho, Crow, Kiowa, Plains Apache, and Shoshone represented these mounted bison hunters although the Lakota may have moved into the region too late to have made significant use of the Vore site.

For over a century researchers have suggested that the introduction of Euroamerican items, especially the gun and the horse; the development of Euroamerican trade systems revolving around the fur trade; and the eventual movement of Euroamericans into the West influenced and changed any number of indigenous practices and cultural systems. These studies have focused on the impact that these Euroamerican items and processes had on native social or political organization; warfare and raiding practices; kinship systems; marriage practices; religious beliefs; settlement practices; and traditional subsistence and economic activities (Abel 1939:72; Fox 1976:7; Hans 1907:25; Humfreville 1903:335; Jablow 1951; Klein 1993:142; Lewis 1942:39; Madsen 1980:18; Moore 1987:138-139; Secoy 1953:52; White 1978:322; Wissler 1914). This work finds the ultimate result of these processes to be the development and fluorescence of the mobile Plains Horse culture.

Still, for the past 100 years other researchers have insisted that the characteristics of the cultural groups on the Plains had already been established prior to the introduction of Euroamerican goods, technologies, ideals, and individuals into the West and that contact only accelerated or helped to further develop these traits (Lowie 1916; Lowie 1927; Wissler 1917; Wissler 1926). In fact the question as to whether the introduction of Euroamerican items, such as the horse, and individuals into the West triggered fundamental changes to indigenous society remains unanswered today (Binnema 2001:86).

In an effort to add to this discourse examined the impact of Euroamerican goods and technologies on indigenous lifeways through an investigation of native subsistence during the Late Prehistoric, Protohistoric, and Historic periods prior to the movement of large amounts of Euroamericans into the region. This analysis is perhaps best conducted from the perspective of recent work seeking to redefine the manner in which we assess change within a given society.

Often when investigating contact events between Euroamericans and indigenous populations the analysis focuses on the corresponding level of cultural change seen in the native population. More recent research considers cultural change and cultural continuity to be part of the same process whereby cultures persist and survive through the ability to adapt to internal and external stimuli. In this manner it is understood that cultural change is indeed the norm and for culture to persist or exhibit continuity they must internalize changes to cultural systems in a manner that is consistent with the traditions, values, and mores of a given culture. It is from this perspective that I will investigate the impact of Euroamerican goods and technologies on native subsistence practices.

Subsistence practices, including indigenous foodways, provide an excellent means of investigating continuity and change in indigenous systems for a number of reasons. First, these traits show a high level of persistence through time. Even after relocation to reservations and the institution of United States government programs to transition indigenous populations away from mobile, seasonal bison hunting towards an agricultural lifestyle native populations in the West continued to move off reservations into the late 19th century to engage in bison hunting. Additionally, native foodways continued to be used into the late 19th century even as many indigenous peoples had at least partially adopted a sedentary, agricultural reservation lifestyle (Lewis 1942:37). Subsistence practices, in this case the hunting of bison, were also essential activities that not only provided food but also tools, clothing, and shelter to indigenous populations in the West.

Hunting and food procurement activities were also practices that were informed by shared systems of knowledge and learned skills passed down from generation to generation which were inextricably interwoven with religious belief, symbolism, and ritual practice (Forbis

1978:3; Frison 1991:219; Frison 2004:27, 32; Harrod 2000:6-7; Witthoft 1953:16). This was surely the case at Vore, reflected in the multiple cultural levels. As such hunting was a highly routinized behavior, grounded in formalized religious meanings which manifested themselves in symbols derived from shared religious traditions (Harrod 2000:7-8). Again this behavior manifests itself at the Vore site, this time in the presence of ceremonial skull alignments (St. Clair 2000:35-45). Finally, it is believed that subsistence activities influence or are directly related to other cultural practices such as settlement patterns and social structure (Hanson 1984:93).

By the end of the Late Prehistoric period bison had become central to indigenous subsistence on the High Plains. Researchers have speculated that the introduction of the horse fundamentally changed the manner in which bison were hunted and how items from the hunt were distributed; ultimately leading to increases in economic ordering (Fowler 2006:4; Gibbon 2003:90; Jablow 1951:19; Klein 1993:142). Still, some work has shown that some of the traditional means of bison hunting were maintained well into the horse period (Lowie 1922:211; Madsen 1980:18). Much like the larger question of how Euroamerican contact impacted indigenous societies the manner in which bison hunting subsistence strategies were altered during the Protohistoric and Historic period remains an issue of debate.

THE VORE SITE

To further investigate bison procurement practices from the Late Prehistoric through the Historic period an analysis of bison hunting, butchering, and transport strategies at the Vore Site was conducted. The Vore Site is a Late Prehistoric/Early Historic bison jump located in the Red Valley of the Black Hills in northeastern Wyoming. The site was discovered by a Wyoming State Highway drilling crew in the 1970's while working on I-90 construction. The bone bed is constrained in the bottom of a karstlike sinkhole 15 meters deep and approximately 31 meters across at the bottom (Figure 2.1). Initial excavations in 1971 and 1972 revealed at least 22 cultural levels, or discrete kill events, that reached a depth of almost 16 meters below the ground surface at the bottom of the sinkhole (Crago 2003:16; Reher and Frison 1980:1).

Initial excavations used 7.5'x10' units excavated in one foot arbitrary levels (Figure 2.2). Profiles from the initial unit (N1) were used to identify cultural levels within the arbitrary one foot levels. Based on this information later units were excavated in inches with cultural level breaks within the larger one foot levels being excavated individually. The entire horizontal extent of the excavation block was opened in the upper levels. Lower levels begin to open smaller and smaller excavation areas with only Unit N1 reaching all the way to the bottom cultural level. This resulted in approximately 10% of Level 1 being excavated with each successive level seeing a smaller sample until less than 1% of the bottom level was sampled. In total, the initial Vore excavations recovered less than 10% of site material. In 1995 the site was re-opened and archaeological investigations have been ongoing ever since. New units were placed adjacent to the south of the original 1970s excavations (see Figure 2.2). These units have expanded the horizontal extent of the upper six cultural levels. The vertical and horizontal extent of the site, the high level of preservation of the bones, and the percent of the site sampled resulted in one of the largest, functional research faunal collections in North America.

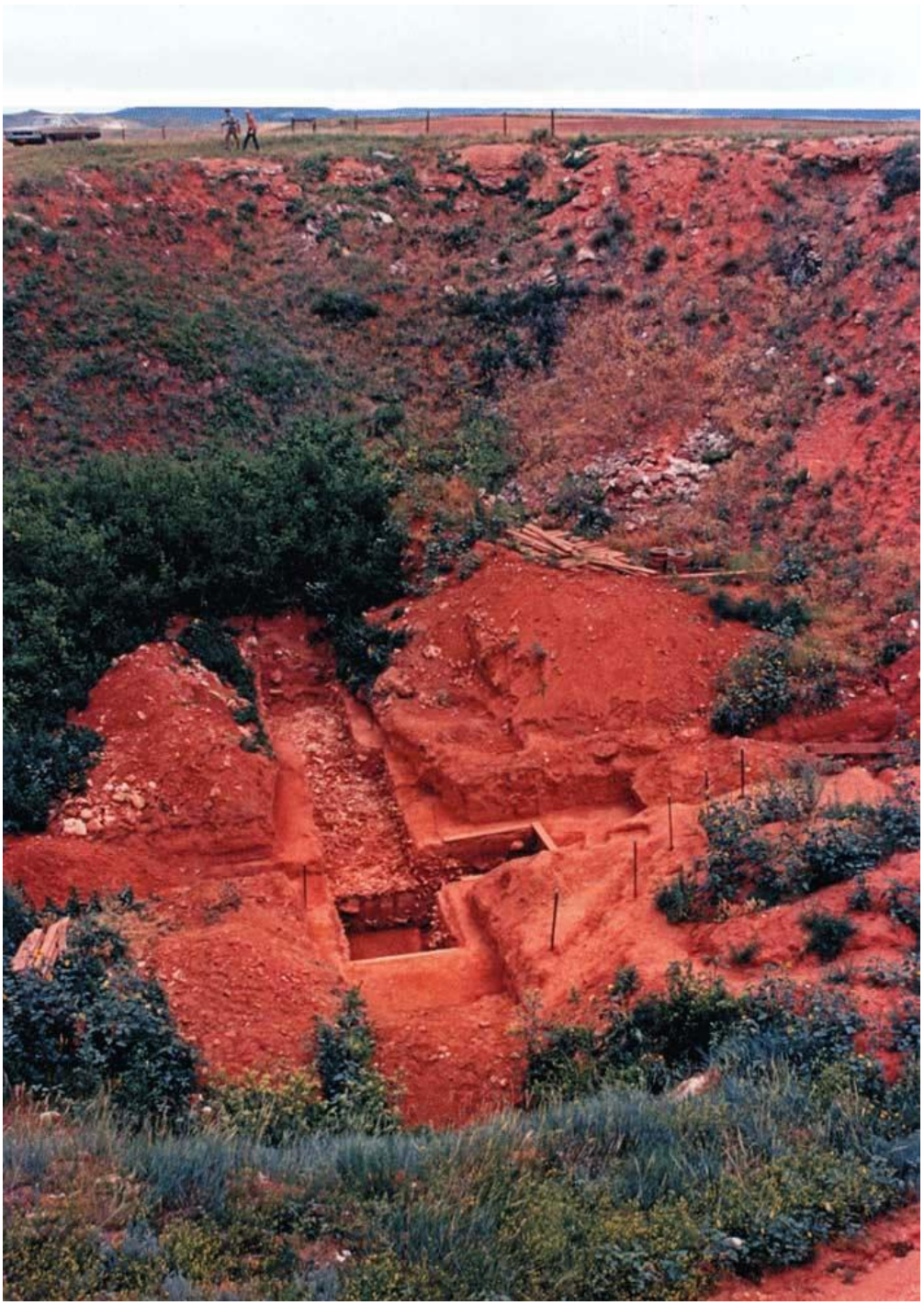

Figure 2.1. Overhead of the Vore sinkhole and excavation units.

Aside from bison bones faunal remains from canids, bear, and other large ungulates have been recovered from the deposits (Walker 1980:154-169). Additionally, 68 chipped stone butchering tools including flake blanks, side scrapers, bifaces, and retouched flakes; 972 retouching flakes; 35 cobble choppers and hammerstones; one grooved maul; bone choppers and fleshers; three bone awls; one bone needle; one antler knapper; two bone beads; and 217 point and point fragments were also recovered from the site during the initial excavations. Tool types recovered from the Vore site are reminiscent of portable, functional butchering kits found at other bison kill sites on the Plains during the Late Prehistoric Period (Reher and Frison 1980:20-25).

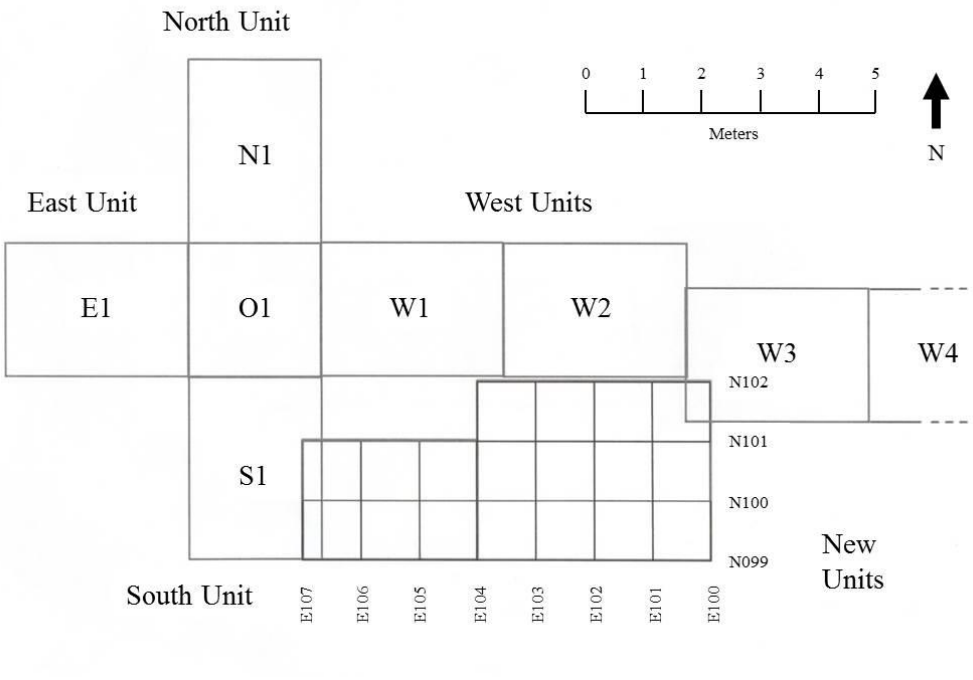

Figure 2.2. Planview of Vore excavation units.

The site was primarily used as a fall/early winter bison kill site by a number of native groups living in the region. Distinct projectile point styles identified between cultural levels within the site indicate use of the jump by a number of different ethnic groups (Reher and Frison 1980:95-120). Although cultural affiliations have not been positively assigned to any of the cultural levels it is possible that indigenous groups such as the Cheyenne, Crow, Kiowa, Plains Apache, Lakota Sioux, and Shoshoni made use of the jump (Reher and Frison 1980:29-34). In fact Cheyenne oral histories mention their use of the site during the Late Prehistoric and/or Protohistoric era (Grinnell 1956; Stands in Timber et al. 1972; Wildschut 1926). While there is, to date, no definitive means of correlating cultural levels to these cultural groups, the sourcing of lithic artifacts found at the Vore site indicate that the groups using the bison jump heralded primarily from the High Plains of southeastern Wyoming and the Powder River Basin in northwestern Wyoming and southeastern Montana. Additionally, periodically material from the tributaries of the Missouri River, north of the Black Hills, as well as Knife River Flint from North Dakota made its way into the site (Reher and Frison 1980:29).

The unique history of the use of the Vore site make it an ideal dataset from which to examine the impact that Euroamerican goods had on indigenous subsistence during the contact era. This single site was used repeatedly from the Late Prehistoric period through the beginning of the Historic period, providing a cross section of time, in one location, from which to investigate subsistence practices. Use of the sinkhole was directly related to bison procurement, a prominent part of indigenous subsistence on the High Plains beginning in the Late Prehistoric period. Additionally, the size of the assemblage as well as the preservation provided a large, intact dataset from which to begin the analysis.

FINDING THE PROTOHISTORIC

Central to the discussion of bison procurement practices at the Vore Site is the ability to clearly define the Late Prehistoric/Protohistoric threshold so as to be able to identify the manner in which the site was used prior to and after Euroamerican items were made available and integrated into subsistence activities. Establishing this baseline at any site can be difficult for a number of reasons. Tribal groups were highly mobile and early access to Euroamerican trade goods was often marked by shortages and uncertainty in resupply options. Indigenous populations on the High Plains and in the Rocky Mountains maintained trade relations with distant groups. Many Plains hunters operating in Wyoming, Montana, and Colorado obtained goods from the Mandan and Hidatsa villages in the Dakotas (Hyde 1959:128-129; Mathews 2008:52; Wood and Thiessen 1985:5). The Lakota Sioux participated in regular trade fairs with the Santee and Yanktoni Sioux in the east and the Shoshoni maintained trade relations with populations from the American Southwest (Galler 2008:472-473). In this manner indigenous populations living on the High Plains and Rocky Mountains could have obtained Euroamerican goods from distant native networks which maintained some level of direct contact with Euroamericans well in advance of the actual movement of Euroamerican traders into the region.

High Plains and Rocky Mountain groups would have obtained trade items through these distant networks in one of two ways. Tribal groups could have gained access to Euroamerican trade goods through first person exchanges, when native High Plains and Rocky Mountain populations traveled east and/or south to visit Euroamerican trading posts or meet Euroamerican

trappers in the field. They could have also acquired these items through down the line native trade (see Clark 1979; Hodder and Orton 1976; and Renfrew 1977 for more on down the line trade). Regardless of the source, trade items were likely to experience shortages and a relative uncertainty of resupply. Trading houses operating on the fringes of Euroamerican exchange networks often experienced item shortages and in many cases seasonal shipments of trade goods were late or never arrived in a given year. This would limit the ability of native traders to exchange for desired items at Euroamerican trading houses or with agents in the field. Additionally, indigenous intermediary traders may have refused to exchange goods with other tribal groups in instances when regular access to Euroamerican goods was limited, as these items would have been reserved for personal use (Binnema 2001:94-96). Shortages and uncertainty in trade item availability, especially during the early Protohistoric period, could result in high curation rates of highly valued items resulting in the presence of archaeological contexts from the Protohistoric and Historic period without the presence of Euroamerican items.

Due to variability in item availability and in the manner in which trade goods were obtained, identifying the exact date when Euroamerican goods reached the High Plains and Rocky Mountain regions of the West can be difficult. In archaeological contexts the co-occurrence of native and Euroamerican goods can be used to identify Protohistoric sites and thus provide a boundary between the Late Prehistoric and the Protohistoric periods. Given the date brackets for the use of the Vore site one would expect that Euroamerican goods would be present in the archaeological deposits. In the case of the Vore site one would expect to see items such as metal knives and points which would have been associated with hunting and butchering activities. Unfortunately, even with the excellent preservation of the site materials, there have to date been no Euroamerican goods recovered from Vore.

The lack of Euroamerican goods makes it difficult to properly differentiate between pre and post contact levels. One means of dealing with this issue is to look for evidence of the presence of Euroamerican goods when the items themselves may be missing. At the Vore site there are thousands of bison bones from kill events reaching into the 19th century (Crago 2003:60; Reher and Frison 1980:xii, 53-59). This places site use firmly in the Protohistoric period and possibly into the Early Historic period. There is ample evidence of bison butchering at this location, but to date no metal tools have been recovered. This does not mean they are not or were not present as less than 10% of the site has been excavated. However, even as the artifacts themselves have not been located evidence of their presence may remain in the butchering marks left on the bones. An analysis of bone surface modifications can identify human made marks such as cutting, chopping, and scraping associated with bison skinning, butchering, and marrow processing. This analysis can also differentiate between stone and metal tool marks. This information can be used to accurately delineate the Late Prehistoric/Protohistoric threshold at the site, through the identification of stone only layers and strata where metal tool marks are present. Differences and similarities in attribute data between these two types of strata can provide information relating to changes in bison procurement and processing through time.

HUMAN PRODUCED CUTMARKS AS A PROXY MEASURE

The analysis of cutmarks on bones is a well-established area of archaeological inquiry that has been used to examine a wide range of questions relating to human behavior (Dewbury and Russell 2007:354). Cutmark analysis has been used as a means of investigating early hominin hunting and scavenging (Binford 1981; Binford 1985; Binford 1988; Bunn 1981; Bunn and Kroll 1986; Potts and Shipman 1981; Potts 1983; Potts 1988; Shipman 1986; Shipman 1988; Shipman and Rose 1983), to examine butchery and transport strategies (Binford 1978; Binford 1981; Binford 1984; Bonnichsen 1973; Bonnichsen 1979; Crader 1974; Frison 1991; Guilday et al. 1962; Jones 1980; Stanford et al. 1981), and to track the spread of metallurgy in Europe (Greenfield 1999).

These studies have used human bone modifications as a means of examining past human behaviors and to look for the presence of items or technologies that while once at a location did not pass into the archaeological record. In fact, what this article proposes is not without precedent. Walker and Long (1977:606) determined that human modifications to bones such as butchery marks can be used to infer the usage of tools at an archaeological site, even in the absence of the tools themselves. As early as 1956 the identification of metal, as opposed to stone, cutmarks on animal bones recovered from a rockshelter in New Zealand were used as a means of assigning a Post European contact date to the occupation (Duff 1956).

In Greenfield's study he examined the frequency of metal versus stone butchering marks on animal assemblages dating to the Late Neolithic through the Bronze Age in the central Balkans and southeast Europe. He found that "quantifying the distribution of metal versus stone tool types over time and space provides insight into the processes underlying the introduction and diffusion of a functional metallurgical technology for subsistence activities" (Greenfield

1999:797). In this study Greenfield used metal cutmarks as a proxy measure to more accurately investigate the spread of metal items and associated technologies.

The absence of metal tools at Vore could be considered unusual as the indigenous population living on the High Plains and Rocky Mountain regions of the West would have been connected to multiple native trade networks, including the Mandan to the east and Spanish networks to the south, which dealt in down the line exchanges of Euroamerican goods. Still, the lack of metal implements at the Vore site could be indicative of the rarity of these items during the early Protohistoric period or of the subsequent deterioration after deposition (Greenfield 1999:797).

Scarcity and material degradation are not the only possibilities limiting the number of metal tools found onsite. It is likely that the paucity of metal tools on a given site during the early Protohistoric is also directly related to the manner in which they were obtained. Without direct access to Euroamerican goods, indigenous populations on the High Plains and Rocky Mountain regions of the West could have been reliant on other native groups who obtained these goods via first, second, or third person exchanges. In this scenario the further "down the line" one was, the fewer goods were available. The scarcity and difficulty of obtaining Euroamerican goods would have increased their value to those that sought to possess them. Shortages of trade goods in indigenous exchange systems could have also been exacerbated by a number of other external events. Supply shortages by trading posts or Euroamerican traders could decrease the number of goods coming into a trade system. In other instances down the line trade networks could be disrupted by warfare, disease, or shifting alliances (Binnema 2001:94-96).

In these contexts where metal implements were scarce or there was an uncertainty when these items could be replaced individuals would have been loath to discard a metal tool. Similar

behavior can be witnessed in relation to lithic technologies. In instances where quality lithic sources are readily available tools may be discarded after seeing little use whereas in situations where quality lithic resources are limited one will see an increase in the retouching, resharpening, and repurposing of tools until they have little or no utility (Dibble 1991:37). In similar instances, when metal implements are rare, difficult to come by, and/or the resupply is uncertain tools would have become precious commodities that were not discarded but resharpened, reworked, or repurposed until there was nothing to be salvaged (Greenfield 1999:797). This practice makes the discovery of metal implements in archaeological contexts unlikely as they were rare to begin with and discarded infrequently.

In light of this it seems clear that identifying the post-contact levels at the Vore site based solely on the presence of metal tools is difficult at best. However, much like Greenfield's 1999 study the identification of cutmarks can provide useful data on when these tools types were present onsite, even if they did not pass into the archaeological record.

THE RESEARCH QUESTION

This study seeks to examine the impact that the introduction of Euroamerican items and technologies had on Native American subsistence during the Late Prehistoric/Protohistoric/ Historic transition. To accomplish this I analyzed a selection of femora, humeri, metacarpals, scapula, and mandibles from the Vore Buffalo Jump. The bones were examined for stone and metal butchering marks. The presence/absence of metal cut marks was used to identify

Protohistoric/Historic and Prehistoric cultural levels respectively. Tool marks were used to identify processing techniques including skinning, butchering, and marrow processing and instances of metal tool use were compared to the minimum number of individuals per level. This level of analysis complements previous work directed by Dr. Charles Reher, who has overseen 28 student research papers recording and examining butchery data, including impact and carnivore activity studies, from the Vore site. These studies did not do extensive cutmark analysis.

The cutmark analysis was integrated with other site data to identify continuity and/or change in bison procurement and processing from the Late Prehistoric through the Historic period. The MNI per level, based on mandible counts, had already been determined. Updated MNI counts were created using humeri and femora data. These new data was compared to the mandible data to examine differences in butchering and transport strategy by examining differences in MNI by element.

It is believed that this analysis will show that: The frequency of metal cut marks will increase in more recent levels. Still, given the lack of major horse transport at the site there should not be a major shift in butchering strategy. Due to this, level traits such as element selection and processing techniques should remain constant. Stone tools will remain in use into the Protohistoric and Historic periods. Meeting these expectations will show there to be continuity in traditional bison procurement and processing strategies.

Potential limitations of this analysis are issues related to sample size and dating brackets. The size of the entire Vore collection is large, making an analysis of every bone unrealistic. I focused on a select number of bones from more recent excavations. These have been processed,

analyzed and sorted by element and location. This project used the existing records to relocate and examine the bones for cut marks.

Dating may also pose an issue. While there are well documented dates for the lower levels of the bone bed, this is not the case for the upper levels. The Vore deposits have been divided into thirds; the top deposits between 1.22-2.44 meters were dated to between A.D. 1700-1800, the middle deposits between 2.44-3.66 meters were dated to between A.D. 1600-1700, and the deposits below 3.66 meters were dated to between A.D. 1500-1600 (Crago 2003:60; Reher 1974; Reher and Frison 1980:29; Reher and Frison 1993; Reher et al. 2008). Calibrated radiocarbon dates and laminated sediments, cross referenced with dendrochronology data, provide an accurate chronology for the lower cultural levels. Initial laminated sediment/dendrochronological cross dating relied on the nearest tree ring sequences which were located in the Upper North Platte River Drainage (Reher and Frison 1980:29, 53-59). This sequence was revised in 2003 using tree ring sequences closer to the Vore site (Crago 2003). In the middle and upper levels the laminated sediments were not as well defined and no reliable radiocarbon dates were available, leaving the chronology somewhat more ambiguous than the lower levels. Issues with the varved sediment dating were exacerbated by the thickness and density of the middle levels which, while appearing to be one very thick level, were likely multiple levels in contact or comingling with one another. Differentiating between distinct cultural levels within the large strata was difficult. Still even as the exact chronology is not understood, researchers believe these levels date to the Protohistoric and Early Historic periods.

The sample for this study will be drawn from available data from the top ten cultural levels, as they rest between 1.22 and 2.44 meters. To compensate for the absence of exact dates the Vore data will be classified as Prehistoric or Protohistoric/Historic. Analysis will focus on

differences or similarities between the two periods. The presence/absence of metal cut marks can be used to classify data into each period. Finer analysis within each period is also possible. Back plots, generated from data from the new units, have been created in an effort to refine previously defined cultural levels. Examining changes between levels can provide the study with data concerning change through time, albeit without exact dates.

METHODOLOGY: CUTMARK IDENTIFICATION AND SITE DATA ANALYSIS

The foundation of the analysis put forth in the previous section relies on the ability to accurately differentiate cutmarks from other human modifications and natural processes that impact bone surfaces. The issue at hand is that a number of agents can cause modification to a bone surface prior to and after it enters the archaeological record. Burning, carnivore marks, rodent gnawing, excavator or preparer marks, insect damage, percussion and chopping marks, root etching, sedimentary abrasion, trampling, vascular grooves, and weathering impact bone surfaces and can mimic or alter cutmarks. Over the course of the past 30 years researchers have spent a significant amount of time creating ways to distinguish between these forms of modification and marks which are human in nature (Andrews and Cook 1985; Behrensmeyer 1978; Blumenschine 1988; Blumenschine and Selvaggio 1988; Blumenschine et al. 1996; Capaldo and Blumenschine 1994; Dominguez-Rodrigo et al. 2009; Egeland 2003; Fisher 1995; Herrmann and Bennett 1999; Olsen and Shipman 1988; Potts and Shipman 1981; Shipman 1981; Shipman and Rose 1983; Walker and Long 1977). While this is an ongoing area of investigation

it is commonly held that human modification of bone surfaces can be differentiated from other taphonomic processes through the identification of a series of diagnostic traits. Likewise, researchers have developed methods of identifying cutmarks created with stone as opposed to metal tools (Greenfield 1999; Greenfield 2002; Greenfield 2005; Olsen 1988; Walker and Long 1977:608).

Research has shown that while diagnostic features such as cutmark shape and the presence of linear striations on the interior of the mark are useful in differentiating human produced cutmarks from other types of bone surface modifications these traits alone are not enough to definitively, in many cases, identify a mark as human in nature. This is due to the fact that bone surface modifications show inter and intra group variability. This results in a range of morphological characteristics within a given group ultimately leading to an overlap in specific diagnostic characteristics between discrete modification types. For analysts this can leave very similar marks caused by quite different causes (Fisher 1995:44; Shipman 1981:365).

To address this issue Fisher (1995:12-16) recommends using a series of diagnostic traits in concert with what he refers to as the configurational approach. It is widely held that a V shaped groove (Figure 2.3), fine parallel striations within the groove (Figure 2.4), and barbs at the end of the groove are traits commonly associated with cutmarks (Figure 2.5) (Bunn 1981; Cook 1986; Lyman 1987; Shipman 1983; Shipman and Rose 1983; Walker and Long 1977). A configurational approach examines contextual information such as the anatomical placement of the mark, the number of marks present on a given bone, the orientation of the mark, and the association of a mark with other bone surface modifications in an attempt to overcome the aforementioned issues with cutmark diagnostics (Behrensmeyer et al. 1986; Oliver 1989; Oliver

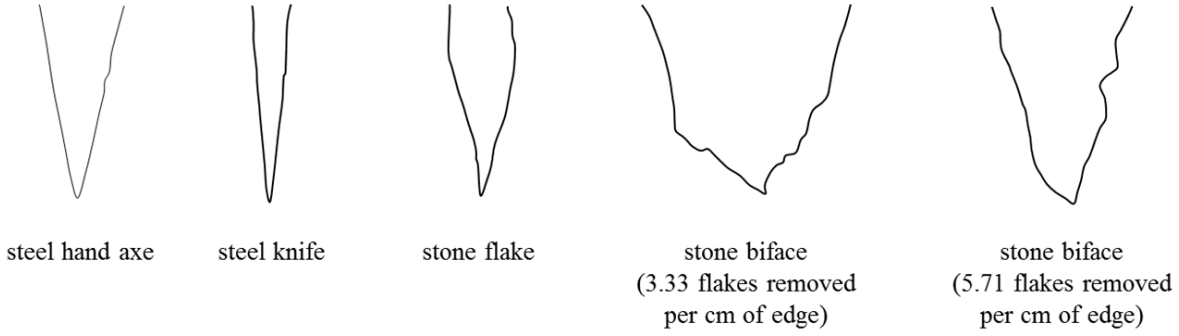

Figure 2.3. Basic morphologies of metal and stone modifications. (Adapted from Walker and Long 1977:607).

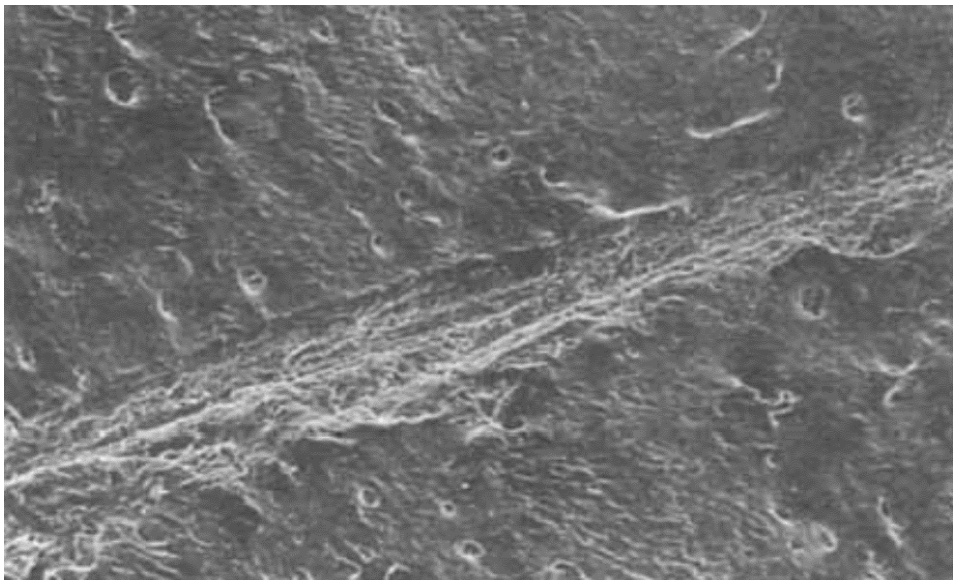

Figure 2.4. Magnified image of a cutmark with striations. (from Shipman 1981:364).

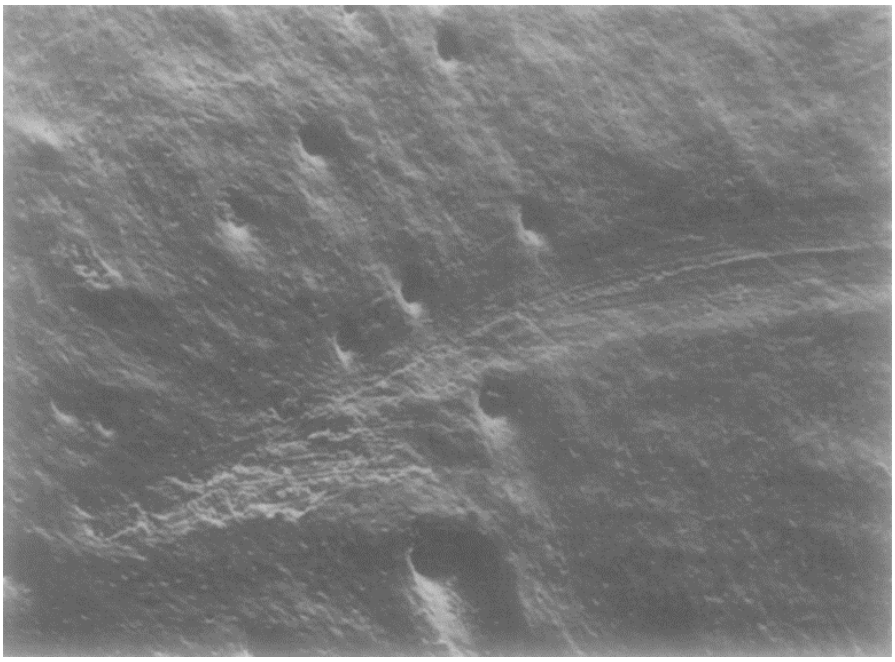

Figure 2.5. Magnified image of a cutmark barb. (from Shipman and Rose 1983:69).

1994; Olsen and Shipman 1988; Shipman 1988). The use of multiple diagnostic traits helps to overcome the shortcomings associated with the overlapping of traits. The configurational approach provides further insight into surface modifications through the use of the contextual information based on our understanding of human butchering practices. Combining these methods of analysis allows researchers to operate with high levels of confidence.

This study recorded the modification's length in millimeters; maximum and minimum width in microns; the association of the bone surface modification with other marks; the cross section of the mark; the presence/absence of symmetrical sides; the presence/absence of a uniform rise to each side of the mark; the presence/absence of a uniform groove depth; trajectory as straight, arcuate, or serpentine; the orientation of the mark on longbones; the location on the bone; the presence/absence of barbs; the presence/absence of striations; and the presence/absence

of uniformity in the striations. The relation of each of these attributes to this analysis is presented in Table 2.1.

The sample for this study was drawn from the top six cultural levels from the Vore site. The selected elements contain samples from the original 1970s excavations as well as the more recent investigations began in the 1990s. The inclusion of elements from the original and recent excavations allow for a broader sampling of the horizontal extent of the upper 6 cultural levels.

This sampling method creates some technical issues that must be dealt with. The original Vore excavations were conducted in one foot levels. As a result of this much of the original data and analysis relies on these arbitrary levels as discrete units. Likewise, much of the comparative analysis done in this paper will be based on these same units. However, this should not limit the accuracy of analysis as each excavation level contains all or portions of one to three cultural levels. Tree ring and varved sediment analysis resulted in an estimate that kill events at Vore were undertaken between 14 and 40 years apart (Crago 2003:60). Based on this estimate each excavation level's data is representative of a minimum of 28 to a maximum of 80 years, certainly a limited enough temporal bracket from which to draw conclusions on changes and/or continuity in site activity through time.

Cutmark data for this study was recorded for the top six cultural levels. This allows for a finer grained analysis of the upper cultural levels, presumably those which represent the terminal Late Prehistoric and incipient Protohistoric periods in the region. Table 2.2 provides a correlation of Vore excavation levels, cultural levels, and other attribute data. Within this table cultural levels 17-22 were dated using the varved sediment and tree ring data. Associated cultural levels were correlated with excavation levels based on work done during the initial excavation phase identifying breaks in the open profiles and through backplots generated from more recent

Table 2.1. Recorded Attributes and their Meaning.

RECORDED ATTRIBUTE	IMPORTANCE
NUMBER OF SIMILAR MODIFICATIONS	Butchery marks generally occur in lower amounts than trampling or sediment abrasion marks.
LENGTH	Cutmarks tend to be longer than other surface modification.
WIDTH	Metal cutmarks tend to be thinner than stone cut marks and chop marks. Metal cutmarks often have a more consistent width across the length of the cut.
ASSOCIATION	Scraping, sediment abrasion, and trampling marks often occur in higher associated numbers than cutmarks.
CROSS SECTION	Roots and vascular grooves tend to be U shaped while chop marks, trampling marks, and cutmarks have a V shaped cross section.
SYMETRICAL SIDES	Vascular grooves and root etching often have symmetrical sides while chop marks, trampling marks, and stone cutmarks generally do not. Metal cutmarks often have symmetrical sides on bifacial blades, although unifacial blades and different cut angles can present unsymmetrical sides.
UNIFORM SIDES	Metal cutmarks generally have uniform slopes to the sides of the groove. Stone cutmarks do not.
UNIFORM GROOVE DEPTH	Cutmarks tend to be shallower at the beginning and end and deeper in the middle. Tooth marks tend to be uniform throughout.
TRAJECTORY	Butchery marks are commonly straight, sediment abrasion can be straight or serpentine, root etchings are serpentine, and trampling can be straight or arcuate.
ORIENTATION	Butchery marks can be oblique, perpendicular, or parallel to the axis of the bone depending on the butchering technique. Often associated cutmarks will have similar orientations. Trampling marks, sediment abrasion, and root etching should show no preference for orientation.
LOCATION	Some modifications show locational preference. Trampling marks are often on the shaft. Cutmarks usually result from three activities: skinning, disarticulation, and filleting. Skinning marks occur around the long shaft of the lower leg and phalanges and the lower margins of the mandible. Disarticulation marks occur on the articular surface, or edges, of long bones and on vertebrae or pelvic bones. Filleting often results in cutmarks parallel to the long axis of a bone.
BARBS	Barbs are sometimes present on the ends of cutmarks. Barbs have not been identified on any other bone surface modification.
STRIATIONS	Stone cutmarks often have internal striations that run parallel to the length of the cut. Vascular grooves, root etching, trampling marks, sediment abrasion, chop marks, excavator damage, and carnivore activity do not present internal striations. Metal cutmarks generally do not leave internal striations. When they do they are of more uniform depth and spacing than those made by stone.
UNIFORM STRIATIONS	Striations found in stone cutmarks have less even length, thickness, and spacing than those found in metal cutmarks.

Table 2.2 Vore Level Data.

Excavation Level	Associated Cultural Levels	Associated Dates	Cubic feet of excavation space	MNI
1	1, 2, 3	1700-1800	581.25	42
2	3, 4, 5	1700-1800	581.25	86
3	5, 6, 7	1700-1800	581.25	116
4	7, 8, 9	1700-1800	581.25	67
5	9, 10, 11	1637-1700	581.25	130
6	11, 12	1637-1700	581.25	22
7	12, 13, 14	1637-1700	281.25	18
8	14, 15, 16	1637-1700	281.25	15
9	16, 17	1637-1700	206.25	4
10	17, 18, 19	1637-1663	131.25	5
11	19	1637-1642	131.25	0
12	20, 21	1572-1608	131.25	0
13	21, 22	1553-1572	75	1

excavations. MNI numbers were obtained using mandible data from the original excavations and presented in the Reher and Frison (1980:77) memoir and femur and humeri databases generated by subsequent research by Dr. Charles Reher. Associated dates were drawn from the work done by Reher and Frison (1980) and Crago (2003). Cubic feet of excavation space was calculated by multiplying the horizontal extent of each level by the one foot excavation level depth. The smaller numbers in the lower cultural levels are indicative of the limited number of units opened below excavation level six. The following discussion will omit excavation levels nine through thirteen, corresponding to cultural levels 17-22, as the area of excavation is severely limited in comparison to the upper eight excavation levels. Additionally, for the remainder of this paper excavation levels will be referred to as such while discussions involving cultural levels will explicitly state this fact so as to avoid confusing the two types of analysis.

While this may seem unnecessarily burdensome, the distinction between cultural and excavation levels is necessary for two reasons. First and foremost these divisions, and the resulting analysis, are a reality for investigators working with the Vore collection due to differences in data collection between the 1970s and the 1990s to the present. Archaeological principles and methods are constantly changing and evolving and the Vore site reflects this.

These distinctions also allow for separate levels of analysis. Using the Vore excavation levels it is possible to track broad changes and similarities over the course of a few hundred years to as few as 28 years. Analysis of the cultural levels provides a finer grained analysis, on a kill specific level, of these same attributes over the course of the Late Prehistoric/Protohistoric/ Historic transition.

Analysis was conducted on 82 bones from the top six cultural levels of the Vore Buffalo Jump. Element types and counts are presented in Table 2.3. Each element was first examined under a 10x magnification lens by three researchers who recorded visible surface modifications. Marks with attributes common to human bone modifications were collectively recorded for each sample. These marks were then independently examined by two researchers under a stereoscopic microscope up to a magnification of 75x. Low magnification analysis generally took between 10 to 20 minutes per bone per researcher, although some took longer to analyze. While higher levels of magnification have been used in other studies employing scanning electron microscopes (SEM), magnification below 100x is often sufficient to accurately identify diagnostic traits. Low level analysis also offers some benefits over SEM analysis. Scanning electron microscopy requires small samples which need to be treated before analysis. This treatment can be costly and the small sample limits the portion of each cutmark that can be examined at one time. Low level magnification requires no pre-treatment and can allow for diagnostic criteria to be more clearly

Table 2.3. Elements and Associated Counts.

ELEMENT	COUNT
FEMUR	8
HUMERI	15
MANDIBLE	33
METACARPAL	6
SCAPULA	20

identified as there is a greater field of vision (Greenfield 1999:799; Greenfield 2006:151). The results of each researcher's analysis were compared with concurring results being recorded as such. Modifications that were recorded differently by researchers were re-examined and recorded only when a consensus was reached. In instances when no consensus could be reached the mark was recorded as unidentified. Data was recorded in the lab on hard copy paper data forms and later transferred to a digital excel file used for the analysis.

The study conducted for this paper was based on previous work by Robert Blumenschine, Curtis W. Marean, and Salvatore D. Capaldo (1996). This study used low power microscope analysis to differentiate between carnivore tooth, hammerstone percussion, and cutting and scraping marks on bones. An overall accuracy of 90% was reached by novices with no prior experience in cutmark or faunal analysis after spending only three hours studying bone modification diagnostics and images. After a total of six hours studying the same material these

individuals increased their accuracy to 95%. Experienced analysts reached over 97% accuracy in correctly differentiating between several types of bone surface modifications.

In an effort to duplicate this type of accuracy researchers for this project spent over ten hours examining bone modification diagnostics and an additional 10 hours analyzing a controlled sample under low magnification. The control sample consisted of twelve cow femora and humeri. The elements were obtained from a local butcher and boiled to remove the flesh and periosteum. Marks made by the initial butchering process were recorded, then each element was marked with a variety of unifacial metal, bifacial metal, bifacial stone, and stone flake marks. Each mark's location and source were recorded. Blind tests were conducted whereby researchers examined a select number of modification on each bone. Efficiency in analysis of this controlled sample increased from less than 80% on the first element to over 98% after an additional 6 hours of microscopic analysis.

For each bone from the Vore sample the number and location of each human modification was recorded. Cutmarks were recorded as raw counts and as butchery instances. A butchery instance is defined as a discrete, non-adjacent (> 1 cm apart), and non-overlapping mark or set of marks (Lyman 1992:250; Lyman 1994:304). Butchery instances were recorded because in many cases cutmarks can be clustered and overlapping. When this occurs earlier marks may be obscured or even destroyed making the generation of an accurate tally of discrete marks impossible. There are also analytical implications to recording the modifications in this manner. It has been suggested that the number of cutmarks is reflective of a differential investment in meat or tissue removal (Binford 1988:127). Butchering skill, tool shape and sharpness, and tissue density can all influence the effectiveness of a single cut. Differences in these areas, and not in reduction technique, can result in differential cutmarks from the same

activity. To compensate for this cutmark instances are used as they likely reflect a single butchery step.

The results of this work were analyzed in several ways. First, cutmark instance frequencies were examined on a cultural level by cultural level basis allowing for an investigation of the relative amount of metal tools in the assemblage during a given kill event. Cutmark data were also integrated with other site data to examine butchery and transport practices.

RESULTS

The analysis of human generated bone modifications included the identification and quantification of cutmarks, chopping marks, and percussion marks associated with prehistoric carcass reduction practices. Not only were these modifications recorded but attempts were made to determine the type of reduction activity that each mark represented. Human made modifications relate to specific types of carcass reduction, each leaving discrete and distinct marks on the bone. Cutmarks can be created during defleshing, filleting, and disarticulation activities. Chopping and percussion marks can be generated during disarticulation, defleshing, and marrow processing. No filleting or hammerstone percussion marks were recorded. Defleshing and disarticulation cutmarks as well as chopping marks associated with marrow processing were recorded.

Of the 82 bones examined, 28 contained human generated modifications. A total of 288 defleshing cutmarks, 55 defleshing instances, two disarticulation marks, two disarticulation instances, four chopping marks, and one chopping mark instance were recorded. Additionally, green bone breakage and interior bone flakes in the vicinity of green breakage was used to identify instances of marrow processing when no tools marks could be identified. Using this criteria 16 instances of marrow processing was recorded, all on longbones. Of the entire sample 34.1% of elements showed signs of defleshing, 19.5% showed signs of marrow processing, and only 2% show signs of disarticulation.

One scapula from cultural level 3 and one humeri from cultural level 5 contained disarticulation marks. These low observances of disarticulation marks may be the result of several factors. First, on many of the longbones the proximal and distal heads were damaged or missing as a result of carnivore activity or marrow processing. The result being that disarticulation marks located on these element portions would have been obscured or destroyed. Second, it is unlikely that the mandibles, 40% of the observed elements, would have been disarticulated, again lowering the number of bones in this study with disarticulation marks. Finally, some of the disarticulation activity onsite may have been done with choppers severing attaching ligaments. This activity may have impacted the bone or destroyed portions of the proximal or distal heads with impact. Regardless of the cause, the paucity of disarticulation marks makes their use as an analytical tool untenable. As such, disarticulation marks will be omitted from further discussion and the term cutmark will be used to specifically reference instances of defleshing unless otherwise noted.

Tables 2.4 and 2.5 present the relationship between element and other modification types. Overall, 34% of our sample bore visible human made bone modifications. The percent varied by

element between 15% and 54.5%. Lower percentages of bones with identifiable modification marks should not be considered unusual as other studies have identified human modifications on between 2% and 14.5% of the examined assemblage (Miller and Burgett 2000:30; Scheiber 2007:304). At Vore previous studies have shown between 6% and 33% of a given analyzed sample to bear evidence of butchery, depending on the element examined (Burgett 1989).

Cutmark frequencies and defleshing instances are variable by element. Mandibles have the highest instance followed by humeri, femora, metacarpals, and scapula. Likewise, marrow processing shows variability by element with only humeri and femora exhibiting instances of marrow processing. Of these two elements humeri show a much higher percentage of marrow removal, with 86.7% of examined humeri exhibiting evidence of processing compared to 37.5% of the examined femora.

Of the 288 defleshing cutmarks identified 174 were made by metal implements and 114 were generated by stone tools. The material of the implement that created the four chopmarks could not be identified (Figures 2.6-2.15 provide a diagrammatic breakdown of human modification types by location on each element). Modifications found collectively on each element are represented in red. Further analysis of these cutmarks reveals that there are 55 total defleshing instances from this sample, 16 of which are from stone tools and 39 of which are from metal implements. Every element except for the humeri has more metal than stone cutmarks and defleshing instances.

The analysis reveals that every cultural level included in this study, cultural levels 1-6, contained bones with metal cutmarks. This correlates with the current understanding of the Vore chronology derived from radiocarbon dates and varve like sediments which date the upper third

Table 2.4. Elements and Associated Defleshing Data.

Element	Sample Count	Elements with Defleshing Cutmarks		Elements with Stone Defleshing Cutmarks		Elements with Metal Defleshing Cutmarks		Total Defleshing Cutmarks	Defleshing Cutmarks		Total Defleshing Instances	Defleshing Instances	
		# of	% of	#	%	#	%		Stone	Metal		Stone	Metal
Femora	8	2	25.0%	1	12.5%	1	12.5%	3	1	2	3	1	2
Humeri	15	4	26.7%	2	13.3%	2	13.3%	5	3	2	5	3	2
Mandibles	33	18	54.5%	4	12.1%	14	42.4%	268	106	162	41	10	31
Metacarpal	6	1	16.7%	0	0.0%	1	16.7%	1	0	1	1	0	1
Scapula	20	3	15.0%	1	5.0%	2	10.0%	11	4	7	5	2	3
	82	28	34.1%	8	9.7%	20	24.4%	288	114	174	55	16	39

Table 2.5. Elements and Associated Marrow Processing Data.

Element	Sample Count	Marrow Processing	% with Marrow Processing
Femora	8	3	37.5%
Humeri	15	13	86.7%
Mandibles	33	0	0.0%
Metacarpals	6	0	0.0%
Scapula	20	0	0.0%
	82	16	19.5%

of the site, roughly cultural levels 1-10, to 1700-1800 (Reher and Frison 1980:29). Stone cutmarks can be found in every level with the exception of cultural level 5. Although the sample of bones with cutmarks is small, between 3 and 8 per level (between 25% and 60% of the analyzed sample per level), there appears to be general similarities between cutmark instances and the percentage of elements modified by stone versus metal in cultural levels 1-5; with cultural level 6 standing in contrast. Cultural levels 1-5 have higher overall frequencies of elements modified by metal as opposed to stone, with a high of 100% metal to 0% stone and a low of 62.5% metal and 37.5% stone. In level 6 the ratio is 50% to 50%. This relationship is even more pronounced when cutmark instances are analyzed. Cultural levels 1-5 have higher overall frequencies of metal versus stone cutmark instances, with a high of 100% metal to 0% stone and a low of 66.7% metal and 33.3% stone. In level 6 the ratio is 66.7% stone to 33.3% metal. Tables 6 and 7 present the relationship between elements, bone modifications, and the Vore cultural levels.

DISCUSSION

The results presented in the previous section allow for analysis of bison procurement and processing techniques during the end of the Late Prehistoric period through the Early Historic period in the High Plains and Rocky Mountain regions of the American West. This can be accomplished through an investigation of continuity and change in the Vore assemblage and a

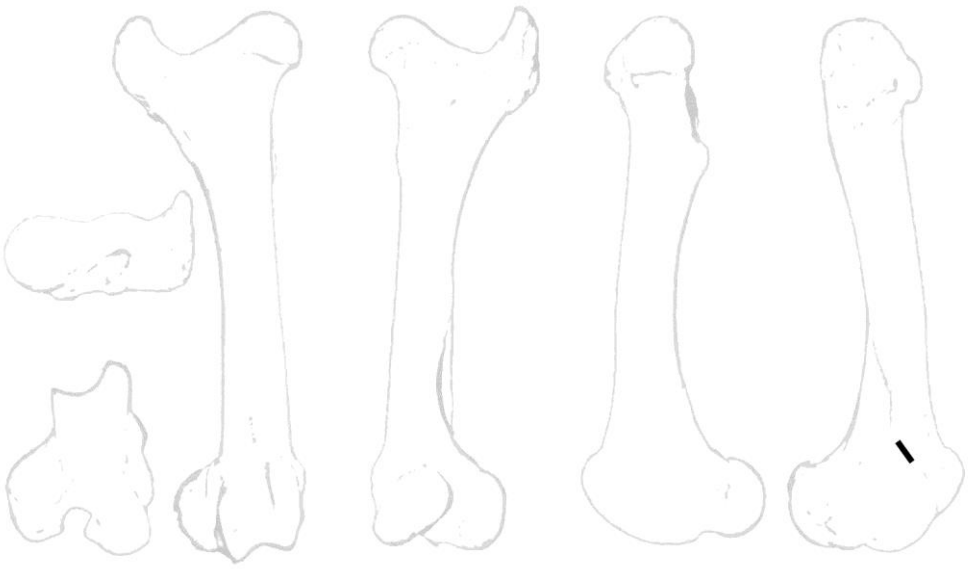

Figure 2.6. Distribution of stone cutmarks on analyzed Vore femora.

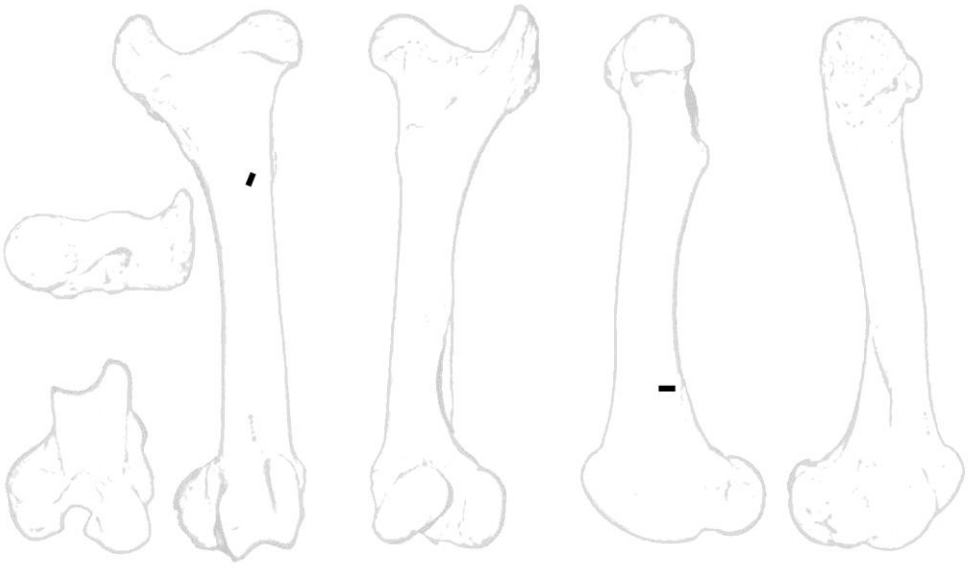

Figure 2.7. Distribution of metal cutmarks on analyzed Vore femora.

Figure 2.8. Distribution of stone cutmarks on analyzed Vore humeri.

Figure 2.9. Distribution of metal cutmarks on analyzed Vore humeri.

Figure 2.10. Distribution of chopmarks on analyzed Vore humeri.

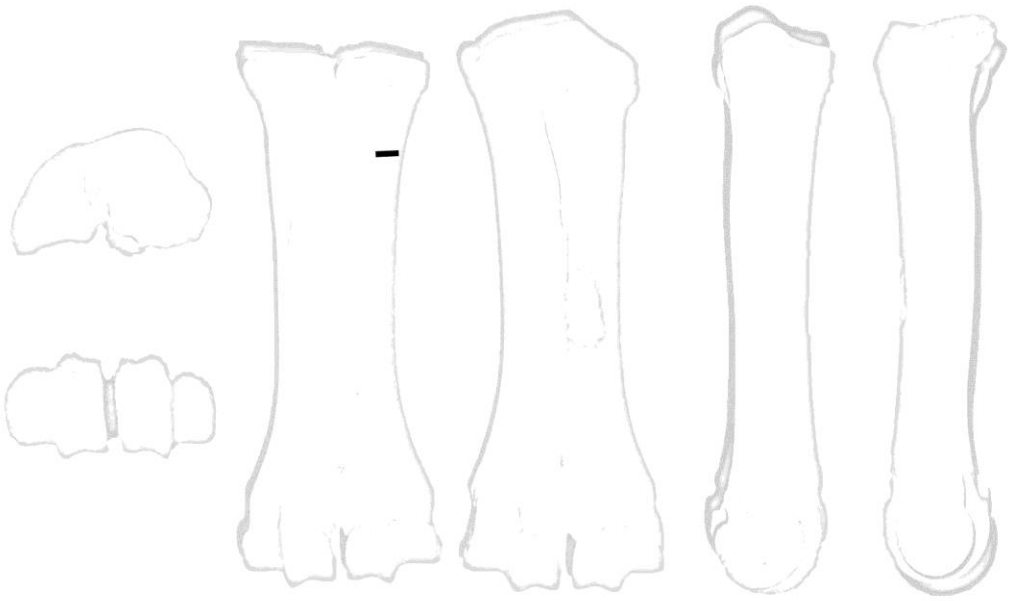

Figure 2.11. Distribution of metal cutmarks on analyzed Vore metacarpals.

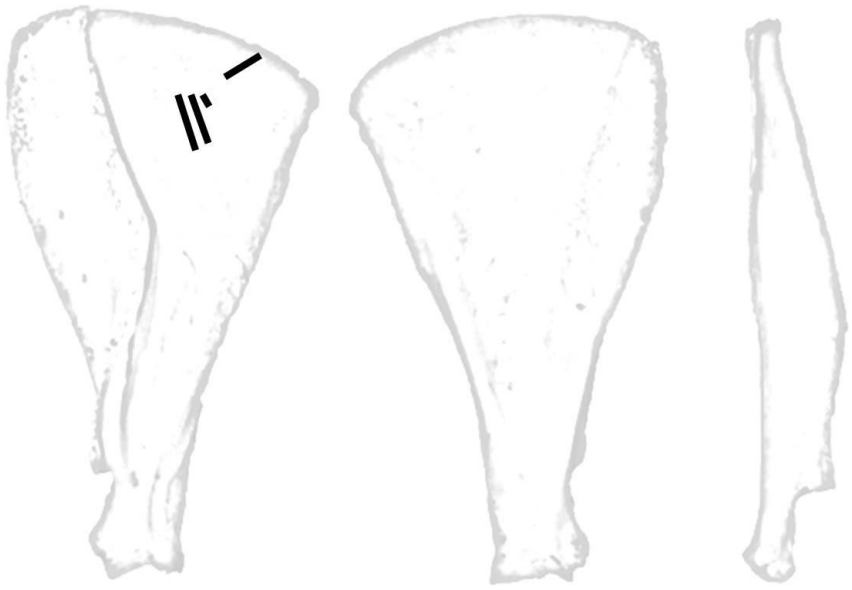

Figure 2.12. Distribution of stone cutmarks on analyzed Vore scapula.

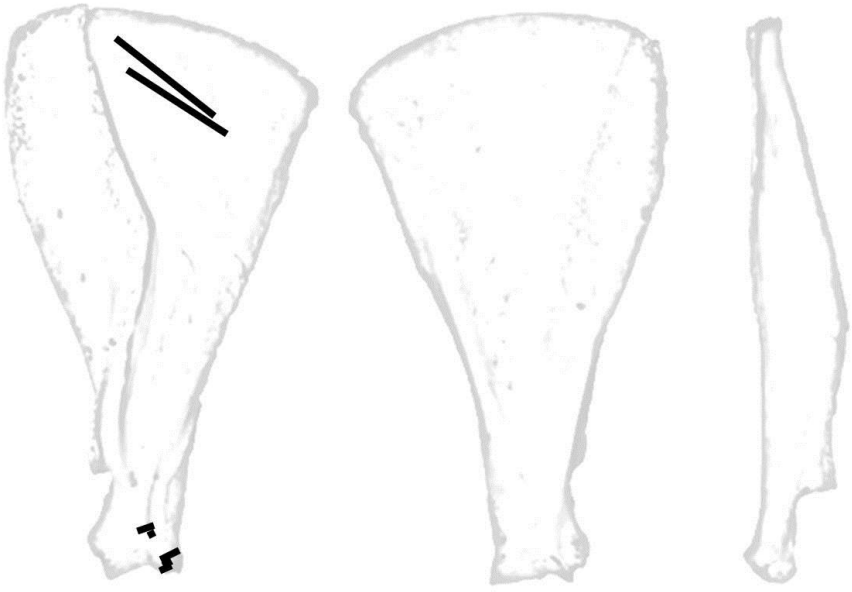

Figure 2.13. Distribution of metal cutmarks on analyzed Vore scapula.

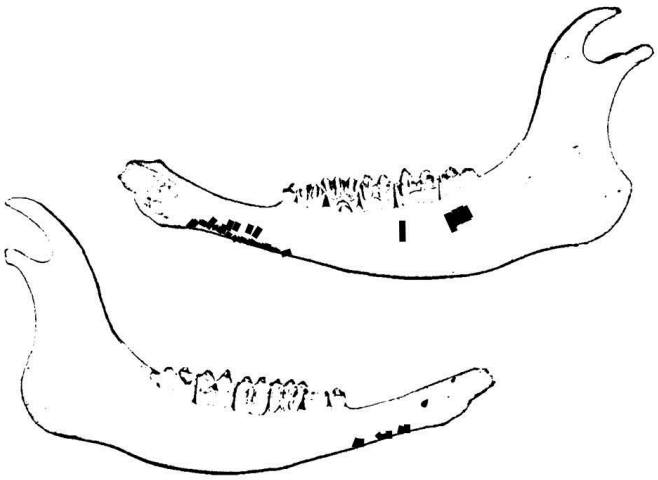

Figure 2.14. Distribution of stone cutmarks on analyzed Vore mandibles.

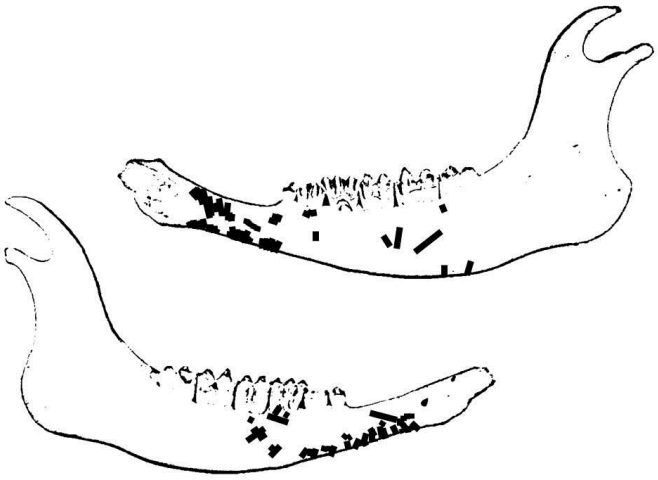

Figure 2.15. Distribution of metal cutmarks on analyzed Vore mandibles.

Table 2.6.Cutmarks by Type, Element, and Level.

Cultural Level		Count per Level	Elements with Cutmarks		Elements with Stone Cutmarks		Elements with Metal Cutmarks		% of Modified Element Which is	
			# with	% of	# with	% of	# with	% of	Stone	Metal
1	Humeri	5	-	-	-	-	-	-	-	-
	Femora	3	-	-	-	-	-	-	-	-
	Metacarpals	1	-	-	-	-	-	-	-	-
	Scapula	3	-	-	-	-	-	-	-	-
	Mandibles	4	4	100.0%	1	25.0%	3	75.0%	25.0%	75.0%
	Level Total	16	4	25.0%	1	6.3%	3	18.8%	25.0%	75.0%
2	Humeri	-	-	-	-	-	-	-	-	-
	Femora	-	-	-	-	-	-	-	-	-
	Metacarpals	-	-	-	-	-	-	-	-	-
	Scapula	4	-	-	-	-	-	-	-	-
	Mandibles	9	4	44.4%	1	11.1%	3	33.3%	25.0%	75.0%
	Level Total	13	4	30.8%	1	7.7%	3	23.1%	25.0%	75.0%
3	Humeri	-	-	-	-	-	-	-	-	-
	Femora	-	-	-	-	-	-	-	-	-
	Metacarpals	-	-	-	-	-	-	-	-	-
	Scapula	4	2	50.0%	0	0.0%	2	50.0%	0.0%	100.0%
	Mandibles	1	1	100.0%	0	0.0%	1	100.0%	0.0%	100.0%
	Level Total	5	3	60.0%	0	0.0%	3	60.0%	0.0%	100.0%
4	Humeri	8	2	25.0%	1	12.5%	1	12.5%	50.0%	50.0%
	Femora	1	-	-	-	-	-	-	-	-
	Metacarpals	3	-	-	-	-	-	-	-	-
	Scapula	5	1	20.0%	1	20.0%	0	0.0%	100.0%	0.0%
	Mandibles	9	5	55.6%	1	11.1%	4	44.4%	20.0%	80.0%
	Level Total	26	8	32.0%	3	12.0%	5	20.0%	37.5%	62.5%
5	Humeri	1	1	100.0%	0	0.0%	1	100.0%	0.0%	100.0%
	Femora	3	2	66.7%	1	33.3%	1	33.3%	50.0%	50.0%
	Metacarpals	1	1	100.0%	0	0.0%	1	100.0%	0.0%	100.0%
	Scapula	3	-	-	-	-	-	-	-	-
	Mandibles	3	1	33.3%	0	0.0%	1	33.3%	0.0%	100.0%
	Level Total	11	5	45.5%	1	9.1%	4	36.4%	20.0%	80.0%
6	Humeri	1	1	100.0%	1	100.0%	0	0.0%	100.0%	0.0%
	Femora	1	-	-	-	-	-	-	-	-
	Metacarpals	1	-	-	-	-	-	-	-	-
	Scapula	1	-	-	-	-	-	-	-	-
	Mandibles	7	3	42.9%	1	14.3%	2	28.6%	33.3%	66.7%
	Level Total	11	4	36.4%	2	18.2%	2	18.2%	50.0%	50.0%

Table 2.7. Cutmark Frequencies, Instances, and Marrow Processing.

Cultural Level		Count per Level	Total Cumarks	Total Butchery Instances	Stone Cutmarks	Stone Butchery Instances	Metal Cutmarks	Metal Butchery Instances	% Stone Butchery Instances	% Metal Butchery Instances	Marrow Processing	% with Marrow Processing
1	Humeri	5	-	-	-	-	-	-	-	-	4	80.0%
	Femora	3	-	-	-	-	-	-	-	-	1	33.3%
	Metacarpals	1	-	-	-	-	-	-	-	-	0	0.0%
	Scapula	3	-	-	-	-	-	-	-	-	0	0.0%
	Mandibles	4	59	6	46	2	13	4	33.3%	66.7%	0	0.0%
	Level Total	16	59	6	46	2	13	4	33.3%	66.7%	5	31.3%
2	Humeri	-	-	-	-	-	-	-	-	-	-	-
	Femora	-	-	-	-	-	-	-	-	-	-	-
	Metacarpals	-	-	-	-	-	-	-	-	-	-	-
	Scapula	4	-	-	-	-	-	-	-	-	0	0.0%
	Mandibles	9	76	11	1	1	75	10	9.1%	90.9%	0	0.0%
	Level Total	13	76	11	1	1	75	10	9.1%	90.9%	0	0.0%
3	Humeri	-	-	-	-	-	-	-	-	-	-	-
	Femora	-	-	-	-	-	-	-	-	-	-	-
	Metacarpals	-	-	-	-	-	-	-	-	-	-	-
	Scapula	4	7	3	0	0	7	3	0.0%	100.0%	0	0.0%
	Mandibles	1	4	2	0	0	4	2	0.0%	100.0%	0	0.0%
	Level Total	5	11	5	0	0	11	5	0.0%	100.0%	0	0.0%
4	Humeri	8	2	2	1	1	1	1	50.0%	50.0%	8	100.0%
	Femora	1	-	-	-	-	-	-	-	-	1	100.0%
	Metacarpals	3	-	-	-	-	-	-	-	-	0	0.0%
	Scapula	5	4	2	4	2	0	0	100.0%	0.0%	0	0.0%
	Mandibles	9	44	14	9	3	35	11	21.4%	78.6%		0.0%
	Level Total	26	50	18	14	6	36	12	33.3%	66.7%	9	36.0%
5	Humeri	1	1	1	0	0	1	1	0.0%	100.0%	1	100.0%
	Femora	3	3	3	1	1	2	2	33.3%	66.7%	1	33.3%
	Metacarpals	1	1	1	0	0	1	1	0.0%	100.0%	0	0.0%
	Scapula	3	-	-	-	-	-	-	-	-	0	0.0%
	Mandibles	3	7	1	0	0	7	1	0.0%	100.0%	0	0.0%
	Level Total	11	12	6	1	1	11	5	16.7%	83.3%	2	18.2%
6	Humeri	1	2	2	2	2	0	0	100.0%	0.0%	0	0.0%
	Femora	1	-	-	-	-	-	-	-	-	0	0.0%
	Metacarpals	1	-	-	-	-	-	-	-	-	0	0.0%
	Scapula	1	-	-	-	-	-	-	-	-	0	0.0%
	Mandibles	7	78	7	50	4	28	3	57.1%	42.9%	0	0.0%
	Level Total	11	80	9	52	6	28	3	66.7%	33.3%	0	0.0%

comparison of this data to our current understanding of bison hunting and processing strategies during this time frame. The following section will present an analysis of the Vore dataset, and integrate this information with archaeological, ethnohistoric, and tribal historical sources in order to investigate the manner in which indigenous subsistence practices were influenced by contact processes, especially the introduction of Euroamerican goods. Element, MNI, and seasonality data provide information on the basic composition of the assemblage and can be used to assess kill size and the relationship of site use to annual seasonal subsistence activities. Butchering and element data allow for an investigation into processing and transport techniques and their relationship to the arrival of Euroamerican goods such as metal tools and the horse. A correlation between metal tool mark frequencies and changes in these areas may indicate broader changes to subsistence activities while continuity of these traits likely points to uniformity in subsistence activities at this location.

Late Prehistoric/Protohistoric Bison Hunting and Processing

In order to accurately assess the manner in which the arrival of Euroamerican goods impacted indigenous subsistence practices we first need to understand what native subsistence looked like prior to the arrival of these items. Bison hunting was practiced by indigenous populations on the High Plains from the Paleoindian period though the Historic era although it is believed that this practice reached its peak, in terms of the number of animals killed, in the Late Prehistoric period (Frison 1991:211; Miller and Burgett 2000:28; Reher and Frison 1980:29-31). It is believed that increases in bison hunting resulted from the development of broader based

subsistence practices and in response to the need to feed larger populations (Bozell 1995:156-157). Tribes such as the Cheyenne, Sioux, and Crow began to increase bison hunting activities to augment other hunting, gathering, and horticultural activities during the Late Prehistoric period when they still inhabited permanent or semi-permanent villages east of the Missouri River. Tribal groups in the east moved west at various points during the year to engage in bison hunting activities and likely reached as far west as the Black Hills or further. As their populations increased bison hunting was further intensified as large communal hunts allowed for massive amounts of meat to be obtained at one time.

Bison hunting could take many forms from single kills conducted by one or a small number of individuals to large communal hunts resulting in dozens or hundreds of captured prey. Communal bison hunting generally involves stampeding bison into natural traps such as arroyos, artificially constructed corrals or pounds, or jumping them off of cliffs or other natural rises (Brink 2008:8; Forbis 1978:3; Hyde 1959:127; Miller and Burgett 2000:28 see also Grinnell 1972:258; Lowie 1922:211; Lowie 2004:72-74 for tribal ethnographic accounts of communal bison hunting). Often these events would involve the use of natural topography and drivelines constructed of wood and rock to help guide the stampeding bison towards the target (Forbis 1978:5). The manner of hunt was determined by topography, group size, and herd size.

While communal hunting could be practiced year round it was the fall hunts that were especially important. Tribal groups required large quantities of preserved meat to survive the winter (Ferris et al. 2000:19; Reher and Frison 1980:236). To acquire this meat, smaller family units and bands aggregated into larger groups to participate in fall hunts (Bozell 1995:157). These hunts were governed by supernatural and ritual beliefs and practices that helped to organize the hunt, compelled people to adhere to the rules of the engagement, and to ensure the

success of the endeavor (Forbis 1978:3; Frison 1991:219). After the introduction of the horse the use of bison jumps and pounds fell off in favor of the chase method whereby mounted hunters would surround or chase a herd killing them with bows from horseback (Brink 2008:246-250; Forbis 1978:7; Frison 2004:120).

After the kill the animals were butchered and transported from the site. Bison butchering was a group wide affair with men and women participating in the process, although ethnographic evidence indicates that men were more often involved in primary butchery practices while women engaged in secondary butchery and cooking (Scheiber 2007:304). The act of butchering a carcass has been defined by Lyman (1987:247; 1994:294-295) as the reduction and modification of a carcass into consumable and/or usable parts. This is not a process defined by a singular act. Rather, butchering is a series of events that begin with the kill and continues until the carcass is totally consumed or discarded (Binford 1978:63). Butchering involves skinning, dismemberment or disarticulation, defleshing and/or filleting, organ removal, marrow or bone grease processing, and the removal of ancillary parts such as horns and sinew (Lyman 1987:247).

The reduction of a carcass is believed to occur in two or three stages. Binford identifies two butchering stages, primary and secondary (Binford 1978:48). Lyman (1987:247) adds a final stage to the first two called the consumption stage. Stage 1, primary butchering, is considered kill stage butchering where the animal is reduced into transportable parts. Stage 2 is a secondary butchering event in which components are further reduced to edible or storable units. Stage 3, the final stage, involves the consumption and presumably the discard of the carcass units.

The process of carcass reduction shows a great deal of variability although Binford (1981:91), using a range of ethnographic sources, finds some general similarities in the reduction techniques of various cultural groups across the globe. Most groups tend to separate the head

from the neck between the occipital condyle and the atlas, separate the neck from the rest of the vertebrae, remove the front legs from the axial skeleton, and separate the rear legs from the vertebrae. Still, as kill and butchery events are distinctly singular events there can be a number of dismemberment and defleshing strategies employed (Lyman 1994:301). This is due to the influence of external factors on the implementation of butchering events. These factors include but are not limited to time of day, time of year, weather conditions, number and/or size of animals killed, condition of the animals killed, ages and/or sex of the animals killed, accessibility of the kill site, soil conditions onsite, group size, and distance to camp (Belcourt 1944:16; Binford 1978:88; Frison et al. 1976:50; Gilmore 1924:24; Kehoe 1967:69-70; Lyman 1987:246; Wissler 1910:41). It is only natural that indigenous populations would have a range of responses to these variables which manifest in differential butchery practices dependent on circumstance.

Research has shown that indigenous populations often only transport a portion of the carcass away from a kill site (O'Connell and Marshall 1989:393). As a result native transport strategies are considered to be directly related to and an influencing factor of butchery practices (Lyman 1992:246; Lyman 1994:299). Distance to transport, method of transport, maximizing edible carcass components, and nutritional requirements may all figure into the manner in which an animal is butchered.

Binford (1978:48) finds that transport innovations above pedestrian transport, such as dog and horse transport, ultimately result in the movement of larger elements and/or larger amounts of meat away from the site. It is also believed that proximity of a kill to camp influences the size and amount of items transported. In scenarios with shorter distances to travel meat will be transported on the bone and larger components will be moved. When there are long distances to

travel meat may be removed from the bone, the carcass will be more completely reduced, and/or fewer items will be taken (Gilbert 1969:289).

A group's nutritional requirements also influence transport decisions. Speth (1983:89) identifies two butchering methods defined as "bulk" and "gourmet" butchering and transport strategies. This theory classifies elements according to their "quality". The quality of an element is directly related to the edible components of each. In this classification system elements such as bison humeri would have a high degree of quality based on the large amount of meat and marrow contained by each while elements such as medapodia would have a low quality as they contain very little meat and marrow. Speth's bulk strategy involves the removal of high and medium elements with the abandonment of low quality elements, although it is possible in times of severe dietary stress low quality elements would also be removed. The gourmet strategy involves the removal of higher quality elements. It bears mention that the gourmet strategy is neither wasteful nor overly selective; this strategy simply selects for higher quality or higher yield skeletal components. Depending on variables such as group size and dietary pressures different butchering strategies will be used to meet the unique nutritional requirements of a specific group.

This interplay between nutritional requirements, distance to transport, and method of transport led to butchery and transport decisions which ultimately seek to maximize the net nutritional benefit of the kill relative to the costs of field processing and transport (O'Connell et al. 1988:113; O'Connell and Marshall 1989:399; O'Connell et al. 1990:301). The result of this decision making process is that elements left at a kill site will have a relatively low caloric or nutritional value in relation to the elements removed from the site. This can often result in the abandonment of axial skeletal elements and the removal of appendicular elements from the kill site (Bunn et al. 1988:438); something evidenced in the Vore levels (Reher and Frison 1980:15).

The Vore Data Analysis

An analysis of the Vore cutmark data shows several interesting trends. First and foremost metal cutmarks are present in every level, indicating that the top six cultural levels at Vore date to the Protohistoric period. The data from these levels reveals a relative continuity in the percentages of stone to metal cutmark distributions, on cutmark bearing bones, and on the percentage of stone to metal butchery instances in levels 1-5 (see Table 2.6 and Table 2.7). An examination of cutmark bearing elements from cultural levels 1-5 reveals that the majority of the bones were modified by metal implements. This same pattern is seen in the investigation of total butchery instances per cultural level. These numbers show a clear preference for metal tools for the first 5 cultural levels of the Vore site, although stone tools continue to be used at the site. Cultural level 6 deviates from this pattern. Cutmark bearing elements from this level break even with 50% being modified by stone and 50% modified by metal tools; a clear deviation from the first five cultural levels. The examination of butchery instances is even more dramatic as 67% of the total butchery instances from this cultural level were generated by stone tools. These data clearly show a difference in the presence, or at least the usage, of metal tools in the upper cultural levels at the Vore site suggesting that metal tools were present in larger numbers in the upper cultural levels and/or were used preferentially during these kill events.

I propose that cultural levels 1-5 represent a portion of time on the High Plains and in the Rocky Mountains when indigenous populations had at least semi-regular access to Euroamerican manufactured trade items which were obtained through native trade networks as well as direct exchanges with Euroamerican trappers, traders, and trading posts. Variations in the percentages

seen across these levels could be a result of changes in trade good availability from year to year, tribal preference, or sample size. Cultural level 6 represents a period when Euroamerican trade goods were difficult to come by. Goods were likely obtained via down the line trade or from sporadic encounters with traders and trappers visiting the region. Should this be the case, metal tool marks will likely remain limited in relation to stone marks in the cultural levels immediately below cultural level 6 only to disappear in subsequent cultural levels. A detailed study of stone and metal bone modifications for cultural levels 7 and below would be needed to verify this hypothesis.

An analysis of the Vore lithics seems to support the conclusion that there is a change in the artifact assemblage between the upper and lower cultural levels. Three general lithic types were recorded at the Vore site: retouching flakes, butchery tools, and projectile points. Tools consisted of four types including large flake blanks, side scrapers, bifaces, and thin retouched flakes. Of the 201 complete or nearly complete projectile points recovered during the initial Vore excavations 198 were from the upper 8 excavation levels. All of these points were typical of the forms seen on the Northwestern Plains during the Late Prehistoric, Protohistoric, and Historic periods. Point morphology and distinctive flaking patterns found between cultural levels suggest that at least five separate cultural groups made use of the Vore site (Reher and Frison 1980:25).

Much like stone and metal cutmarks, all three lithic categories are found in each level (Table 2.8). In examining the lithic assemblage from Vore comparing raw numbers per level is likely not a productive means of investigating changes or similarities through time. This is primarily because of the variability of each kill. Each event was participated in by a different

Table 2.8. Vore Lithic Data.

Excavation Level	Associated Cultural Levels	Associated Dates	Level MNI	# of Flakes	Flakes per bison	# of Tools	Tools per bison	# of Points	Points per bison
1	1, 2, 3	1700-1800	42	118	2.8	79	1.9	15	0.4
2	3, 4, 5	1700-1800	86	332	3.9	212	2.5	32	0.4
3	5, 6, 7	1700-1800	116	461	4.0	267	2.3	29	0.3
4	7, 8, 9	1700-1800	67	306	4.6	199	3.0	35	0.5
5	9, 10, 11	1637-1700	130	536	4.1	311	2.4	23	0.2
6	11, 12	1637-1700	22	34	1.5	32	1.5	15	0.7
7	12, 13, 14	1637-1700	18	56	3.1	57	3.2	26	1.4
8	14, 15, 16	1637-1700	15	62	4.1	55	3.7	23	1.5

number of people, various tribes, and resulted in the collection of a different number of bison. Excavation levels 1-8 returned an MNI of between 15 and 130 bison. This number, of course, does not reflect the actual number of bison contained within each excavation level as the sample size for these levels is only between 2.86% and 9.55% (Reher and Frison 1980:13). However, as the lithic assemblage has the same sample rate as the bison bones themselves from each excavation level, these two sets of data provide a useful comparative sample from which to base our analysis. Additionally, the lower excavation levels were not opened to the extent of the upper six resulting in lower MNIs for excavation levels 7-13. All of these factors result in wide variability in bison MNI numbers as well as the lithic assemblage. In an effort to allow for a cross level comparison flake, tool, and point counts were generated in relation to the MNI for each level. This resulted in the creation of a Flakes per Bison, Tools per Bison, and Points per Bison count which provided a means of assessing the number of lithics deposited at the site in relation to the intensity and size of the actual kill event.

As was mentioned earlier, this discontinuity between the levels of analysis with the cutmark data and other Vore datasets does not prevent the comparison of the two samples.

Cutmark data showing continuity in the upper five cultural levels correlates to excavation levels 1 and 2 in the lithic and MNI data. A Z test for significance, with a p value of .05, showed that flake and tool counts per bison, when compared to the rest of the sample were significantly different for only excavation levels 1 and 6. Projectile points reveal statistical significantly differences between excavation levels 1, 2, 3, and 5 and the rest of the sample (Table 2.9).

The reduction in flakes per bison and tools per bison in excavation level one, cultural levels 1-3, matches nicely with the hypothesis put forth earlier. As metal tools became more common stone tools would have been relied on less intensively. Should this be the case one would expect stone tools, and more importantly resharpening flakes to become less frequent in the assemblage. Resharpening flakes are perhaps more representative of stone tool use onsite as tools themselves would retain some level of value and would only be discarded when completely used up or accidentally lost. Resharpening flakes on the other hand contain no value and were readily discarded, making them ideal for tracking relative stone tool use at a site as they can represent tools used onsite and then removed.

Lithic flake and tool data generally support the expectation, based on the cutmark data, that there will be a reduction in stone tool use in the upper cultural levels. However, excavation level 6 also returned significantly lower flake and tool per bison counts than the lower levels. This should be considered unusual as lower excavation levels tend to have increased levels of raw lithic counts and per bison counts. Of interest is that excavation level 6 returns a number of other apparently anomalous data points when compared to the rest of the assemblage. This level has a drastically lower mandible MNI per cubic meters of excavation than the rest of the excavation levels, and it is the only layer in the top 8 excavation levels that has higher femur and humeri MNIs than mandible MNIs (Table 2.10).

Table 2.9. Vore MNI Data.

Excavation Level	Associated Cultural Levels	# of Flakes	Flakes per bison	Flake Z Value	# of Tools	Tools per bison	Tool Z Value	# of Points	Points per bison	Point Z Value
1	1, 2, 3	118	2.8	0.015	79	1.9	0.003	15	0.4	0.039
2	3, 4, 5	332	3.9	0.856	212	2.5	0.380	32	0.4	0.046
3	5, 6, 7	461	4.0	0.921	267	2.3	0.158	29	0.3	0.009
4	7, 8, 9	306	4.6	0.999	199	3.0	0.967	35	0.5	0.205
5	9, 10, 11	536	4.1	0.970	311	2.4	0.269	23	0.2	0.003
6	11, 12	34	1.5	0.000	32	1.5	0.000	15	0.7	0.533
7	12, 13, 14	56	3.1	0.106	57	3.2	0.996	26	1.4	1.000
8	14, 15, 16	62	4.1	0.972	55	3.7	1.000	23	1.5	1.000

Table 2.10. MNI Counts by Element and Level.

Excavation Level	Associated Cultural Levels	Mandible MNI	Femora MNI	Humeri MNI	Cubic Feet per level	Mandible MNI per cubic foot	Femora MNI per cubic foot	Humeri MNI per cubic foot
1	1, 2, 3	42	5	14	581.25	.072	.008	.024
2	3, 4, 5	86	7	8	581.25	.148	.012	.014
3	5, 6, 7	116	12	16	581.25	.199	.021	.028
4	7, 8, 9	67	9	12	581.25	.115	.015	.021
5	9, 10, 11	130	31	35	581.25	.223	.053	.060
6	11, 12	10	15	22	581.25	.017	.026	.038
7	12, 13, 14	18	10	10	281.25	.064	.036	.036
8	14, 15, 16	15	2	5	281.25	.053	.007	.018

Excavation level 6 needs further investigation before we can truly understand these apparently anomalous data points as there are multiple factors that could have created these results. Seasonality, differential transport strategies, the number of bison killed in this particular hunt, differential distribution of activity areas across the site which may not have been accurately sampled by the unit placement, the manner in which the cultural levels split across the excavation levels could have occurred in such a way that element and lithic data was split unevenly between excavation levels, or the area sampled by the excavation itself may not be accurately representative of the rest of the level. In any case this level is an outlier when examining trends in the element and lithic assemblages.

Projectile point data generally appears to support the conclusions of the cutmark and lithic tool and flake data that show a break in continuity between the upper and lower cultural levels albeit without the precision seen in the other datasets. Points per bison range between 1.5 and .2 per level. A Z-test of this sample indicates that point per bison counts for excavation levels 1, 2, and 3, cultural levels 1-7, returned statistically significant lower numbers when compared to the sample at large. Additionally, excavation levels 4 through 8 show a general increase in counts from .5 to 1.5 points per bison per excavation level. This data seems to support previously discussed lithic data that suggest lithics saw a reduction in use at the site in the upper cultural levels as one moves deeper into the Protohistoric period.

Unfortunately excavation level 5 bucks the trend of increasing point counts as one moves back in time away from the Protohistoric period. Z-tests also indicate that point per bison counts for excavation level 5 (n=.2) are statistically significantly lower than the rest of the sample. This number falls right in the middle of an ascending number trend from .5 to 1.5 from excavation levels 4 through 8. As with the anomalous MNI data from excavation level 6 there are a number

of possible causes for the apparent low point totals in excavation level 5. The numbers could be inherently related to the nature of the hunt that year, it could be the result of a sampling issue, or it could be related to the manner in which the excavation levels and cultural levels break at that point. Regardless, the point data when compared to MNI, cutmark, and other lithic data from the rest of the site again suggest a difference between the upper and lower cultural levels.

The fact that different datasets point to different cultural levels should not be considered unusual. The Protohistoric period was a transitional time when new people and technologies were entering the region. The movement of these entities was not uniform across the region, nor was it consistent or reliable across time. Furthermore, the Vore site was likely used by a number of different tribal groups resulting in natural variation in the archaeological record. The net result of these factors is that while stone tool use shows a general decline in use at the Vore site into the Protohistoric period issues of material availability, technological adaptation, and maintenance of traditional cultural practices result in variation in the representation of this process in the archaeological record.

Still, analysis has shown that cultural level 6 dates to the early Protohistoric period. Analysis of changes and/or similarities above and below this horizon will allow for a discussion on the nature of indigenous subsistence during the Historic/Protohistoric and Late Prehistoric periods respectively and the impact that the introduction of Euroamerican goods had on these cultural practices.

Bison Hunting and Processing at the Vore Site

It has been theorized that differences in archaeological assemblages, including variability in tool marks on bones, bone breakage patterns, and the type and number of butchery units present in a faunal assemblage have the ability to provide insight into patterned human behavior (Binford 1978:61-62; Binford 1981:95; Bozell 1995:155-156; Bunn and Kroll 1986:436; Frison 2004:xiii; Frison et al. 1976:49; Lyman 1992:248; Lyman 1994:307; O'Connell et al. 1988:113; O'Connell and Marshall 1989:393). The Vore site, due to its length and period of use, the extent of the collection, as well as the preservation of the assemblage, makes an ideal site from which to conduct this form of analysis. In light of this, an analysis of the Vore assemblage in relation to our current understanding of prehistoric bison hunting activity allows for a more detailed understanding of indigenous hunting and subsistence practices from terminal Late Prehistoric through the Early Historic period in the Black Hills region of the American West.

The Black Hills region provided an optimum environment for bison hunting during the prehistoric period (Frison et al.1976:29). Tribal groups participating in bison hunting in the region made use of the Vore site sinkhole for approximately 300 years from the early part of the 16th century to the first decade of the 19th century. For much of this period pedestrian hunting would have been practiced whereby drivelines would have been used to guide bison towards the sinkhole where they would have eventually been stampeded (Frison 1991:226; Reher and Frison 1980:136). Use of the site terminated in the early horse period, presumably as tribal groups in the region transitioned towards the chase method of hunting whereby mounted hunters would surround and run down bison herds, firing arrows and killing the animals while still mounted (Forbis 1978:7).

Bison hunting was a year round activity although different strategies were employed at different points of the year. Hunting strategies employed by High Plains bison hunters, based on

their knowledge of bison behavior and condition, involved the targeting of bull herds in the spring and summer and cow/calf herds in the fall and winter due to changes in behavior and the nutritional state of the cows and bulls throughout the year (Speth 1983:143). At Vore, an analysis of tooth eruption, longbone epiphysis fusion, and male/female longbone counts indicate that the jump was used primarily from fall into early winter with an occasional spring kill (Burgett 1989:13; Frison 1991:226). It then seems likely that the site was primarily used by indigenous populations to procure their winter meat repeatedly over the course of some 300 years.

Further continuity of site use can be seen in the butchering techniques used at Vore. Butchering practices from level to level are generally considered to show similarities from the top to the bottom layer (Reher and Frison 1980:23). This method involved the reduction of animals into transportable parts such as individual muscles packets stripped from the bone and/or articulated bone units which were then removed from the site for further processing (Reher and Frison 1980:151). There also appears to have been some level of marrow and/or bone grease extraction onsite although most quality marrow bearing bones were removed from the site, presumably for processing at a later date (Reher and Frison 1980:15).

Excavations at the Vore site unearthed rather distinct pilings of bones, often of single or similar elements, with areas of low bone concentrations between them (Reher and Frison 1980:15). It is believed that sorted and/or stacked concentrations of selected elements reveal specialized butchery activity at the Vore site, possibly indicating some form of "assembly line" butchery where individuals are tasked with specific reduction activities rather than attempting to butcher an entire animal individually (Reher and Frison 1980:18; see Frison 1967b for a detailed discussion on "assembly line" butchery practices). A systematic spatial analysis of element location within the Vore excavations has not been conducted, however, concentrations of similar

elements were observed during the initial excavations and in subsequent investigations beginning in the 1990s. These bone concentrations are believed representative of some level of co-operative, specialized butchery practiced throughout the use of the site. Kill size, party size, and individual/tribal preference could play a role in the institution of this practice by level. A more intensive spatial analysis of element distributions by cultural level is necessary to gain further insight into this phenomenon. However, as this type of investigation lay outside the scope of this project it is sufficient to say that co-operative, specialized butchery was practiced at the site at various times from the first use to the last.

An analysis of major limb bones from the Vore collection in the 1980s by Galen Burgett revealed further similarities in butchery practices across the Vore levels. Burgett (1989:11) found that the general pattern of butchering onsite involved a muscle stripping tactic whereby muscle packets were cut or chopped from the bone and removed from the site. Additionally, this study found that the butchering strategy implemented at the Vore site involved the selection of high meat and marrow bearing elements at the exclusion of other less desirable portions of the carcass, the "gourmet" strategy defined by Speth (1983:89). Based on this analysis it appears that prehistoric hunters using the Vore site were either not under severe dietary stress or were camped at a distance that would have made the transport of lower utility items prohibitive. However, as there is no indication by Burgett that butchery practices or element selections changed in the Protohistoric period, when horse transport would have become available, it is likely that element selection was influenced by dietary factors.

The analysis conducted by the author for this study supports Burgett's conclusions. The location of cutting and chopping marks identified in my analysis supports the muscle stripping strategy described above. Many of the marks on the longbones were horizontal or oblique marks

located in the vicinity of muscle attachments or on the distal or proximal epiphysis. This form of carcass processing should not be considered unusual as these defleshing marks are generally associated with primary butchery practices while filleting marks, marks that occur longitudinally along the axis of the longbone, are considered to be a secondary butchery activity (Binford 1981: 127-128). At Vore, the absence of filleting marks indicates a practice whereby indigenous hunters using the site reduced carcasses into manageable units or individual meat packets for transport to a secondary location. This method of reduction, and the associated transport strategy, appears to have been favored throughout the use of the site, belying a continuity of practice through the Late Prehistoric/Protohistoric/Historic transition.

My study also suggests that dietary stress may not have been a major concern for the populations using the Vore site. Burgett found that the production of bone grease was not a primary goal of the reduction activities at Vore and that marrow processing was limited to high quality elements. An analysis of elements examined for this study show that humeri were the only element with frequent instances of marrow processing with 86.7% of analyzed humeri showing signs of marrow processing. No mandibles, metacarpals, or scapula were reduced for marrow and only 37.5% of analyzed femora showed signs of processing. These numbers show a clear preference for high quality, high yield marrow bearing elements with low quality elements being disregarded. Again these results point towards a "gourmet" carcass reduction strategy that was favored for the duration of the site's use.

Tongue removal is another butchery practice that sees continuity of practice through time at the site. Cutmarks on the inside and outside bottom portion of the mandible are believed to be indicative of tongue removal. Between one and nine mandibles were analyzed per level with each cultural level showing evidence of tongue removal activities. The variation in sample size

between cultural levels makes a detailed analysis difficult. The data does suggest that tongue removal increased somewhat in the upper levels. Should this be the case this would not be considered unusual as tongues, which were a favored cut prior to contact, became a valued trade commodity during the fur trade era (Lewis 1942:29). In light of this, an increase in the collection of tongues would be expected. However, levels returning high percentages of processed mandibles come from levels with low numbers of mandibles analyzed leaving open the possibility that these results are a sampling issue. Further investigation is needed to verify this hypothesis.

A further analysis of the mandible sample shows that in all instances, save one, MNI counts for the mandibles are higher than those for femora or humeri, in some cases by a ratio of 12:1. While the ratio between mandible and long bone counts varies widely (see table 2.10) the presence of higher mandible verses long bone counts in most of the upper 16 excavation levels suggests a butchery and transport strategy favoring onsite mandible butchery and tongue removal. The apparently anomalous data from excavation level seven may be a result of sampling concerns whereby unit placement does not accurately represent the activity structure of the kill event, the interplay between cultural and excavations levels or variables associated with prehistoric activity such as tribal preference, or other aforementioned issues. Variation in MNI ratios between levels may also be attributed to these factors. Still, even with intra level variation the disparity in mandible versus longbone MNI counts from the top to the bottom of the site represent a persistence of butchery and transport practices through time at the Vore site that again spans the pre and post contact transition.

Variation in the MNI and individual element analysis should be expected due to differences in excavation and recording procedures through time as well as the natural variation

built into each hunt such as differences in herd size, animal size, seasonality, human group size, and tribal preference which would have been different with each kill event. Still, these MNI and elemental data do not reveal a decisive break in continuity which one would expect should major changes to site use have occurred. Rather, a holistic analysis of the Vore data shows a general continuity of hunting, butchery, and transport strategies over time that when compared to the cutmark data appears to span the Late Prehistoric/Protohistoric/Historic transition, a trait that was first recognized by Reher and Frison (1980:23).

Implications and Insights

Continuity in the Vore assemblage suggesting similarities in hunting, butchering, and transport practices from the Late Prehistoric through the Early Historic period is juxtaposed with the cutmark and lithic data showing clear differences between the upper and lower cultural levels included in this study. The relationship between these conflicting datasets and their implications for an analysis of larger cultural continuity or change in indigenous subsistence systems needs to be discussed. Silliman (2009:211, 213) warns against the trap of equating a one to one relationship between changes and/or similarities in material assemblages and change and continuity in indigenous cultural systems whereby the influx of foreign items, Euroamerican goods in this study, and the coinciding shift in material assemblages are reflective of larger cultural changes. Lightfoot (1995) finds changes in material assemblages alone often do not provide definitive data of the degree and direction of cultural change. This is largely due to the fact that technological, socio-cultural, and economic change varies across time and from place to place (Mitchell and Scheiber 2010:11).

Simply put, all of these phenomena do not affect all cultures simultaneously nor uniformly; largely in part to the manner in which foreign items were integrated into native societies. Often foreign objects or technologies were imbued with new, indigenous meanings by native cultures (Harrison 2004:141; Hodge 2005:85; Loren 2001:67; Loren 2003; Silliman 2009:215; Silliman 2010:36-37). In some instances Euroamerican goods or technologies served as replacements for indigenous analogues such as the replacement of traditional shell or stone beads and quillwork technologies by glass beads or the adoption of functional types such as metal tools or copper kettles which served to replace existing native technologies (Ewers 1997:48; Jordan 2009:34; Loren 2007:103). In other instances items of Euroamerican manufacture were repurposed and/or given new native meanings such as when Euroamerican trade metals were recycled and fashioned into ornaments or tools like projectile points or when items such as the gun, compass, telescope, magnet, or watch were integrated into native healing practices (Ewers 1997:25-27, 48; Hodge 2005:85; Loren 2003; Loren 2007:23; Prince 2002:50). Some items like lantern glasses were integrated into traditional socio-religious practices because of their perceived magical abilities. Other items such as copper, brass, tin, and glass trade goods due to their association with marine shells, native copper, rock crystals, and colored stones, items traditionally associated with the supernatural and supernatural beings, were given supernatural properties or meanings (Ewers 1997:25-27; Gosden 2007:172-173; Jordan 2009:34). Finally, some items such as Euroamerican clothing, textiles, jewelry or other personal adornments, grave monuments, and building materials were integrated into indigenous practices, traditions, and value systems through processes of appropriation, reconfiguration, and recontextualization as a means of strengthening traditional indigenous cultural practices (Prince 2002:63; Rothschild 2008:142; Rubertone 2001:140; Silliman 2009:114).

These examples provide a mechanism from which to re-evaluate the manner in which the relationship between material culture and technological change and larger cultural change is understood. Investigations focusing on shifts or changes in material goods or technologies are often really interested in examining larger cultural changes that are believed to be reflected in the material culture (Scheiber and Finley 2010:139). In order to accurately make this connection, researchers must focus not only on the presence or absence of new or foreign materials or simply compare differences in artifact assemblages between or within sites. Rather, they must attempt to determine the context in which an item or technology was obtained, produced, used, discarded, and understood by a given culture.

Focusing investigations on the construction and maintenance of past identities is an outgrowth of research seeking to redefine the manner in which issues relating to continuity and change in cultural systems are conceptualized and discussed (Harrod 1995; Hodge 2005; Prince 2002; Rogers 1993; Rothschild 2008; Rubertone 2001; Scheiber and Mitchell 2010; Silliman 2009; Silliman 2011; Silliman 2012; Stahl 2012; Tveskov 2007; Vitelli 2009; Vitelli 2011). This work, rather than viewing cultural change and /or continuity as separate and distinct outcomes, is built on the understanding that the two are interrelated and the existence of one does not necessarily prohibit the existence of the other (Silliman 2009:212-213). Culture, tradition, and cultural identity are not static entities (Haley and Wilcoxon 2005). These traits see continual maintenance through the innovation, re-invention, and re-conceptualization of traditional indigenous systems and worldviews (Tveskov 2007:431-432). This process allows indigenous, and in fact all, cultural groups to integrate new ideas, technologies, and individuals through the collective reinterpretation of traditional values, mores, and worldviews through sanctioned socio-cultural institutions (Harrod 1995:28). This process results in creative responses to external

stimuli that often led to the expansion, not destruction or corruption, of traditional cultural practices and systems while simultaneously leaving in place cultural beliefs and existing cultural systems which remained, or were believed to have remained, unchanged (Harrod 1995:3, 29). From this perspective it is possible to examine the manner in which small scale changes, such as the adoption of new items or technologies, impacted a group's ability to maintain long standing cultural institutions and value systems (Rogers 1993:75).

Cultural Identity and the Integration of New Items and Technologies

The ability for native groups in the West to maintain cohesive cultural identities likely stems from the manner in which they self-identified during the Late Prehistoric, Protohistoric, and Historic periods. Many interpretations of the Protohistoric and Early Historic periods find Native American/Euroamerican relationships as central to social interaction in the West. However, it is unlikely that this dichotomy existed (Binnema 2001:9). During this time tribal or band organizations were the primary means of social and cultural identification. Relationships were based on an insider/outsider method of conducting group and interpersonal interactions. Individuals self-identified with their particular unit, be it a band or tribal organization. All others, regardless of if they were Euroamerican or a different Native American group, were considered outsiders.

The West was a dynamic landscape and the indigenous cultures that lived there had been adapting to environmental, demographic, and social changes for centuries. In a sense Euroamerican goods were simply another in a long line of foreign introductions into a region where Euroamerican ideas, politics, and meaning were absent or held little sway. The

introduction of new Euroamerican items and technologies would have been integrated into indigenous cultural institutions. Thorough this process these items would have worked to ease subsistence pressures without rapidly or radically transforming native worldviews or cultural institutions (Binnema 2001:114-115).

Implications for the Vore Assemblage

Three lithic and one cutmark dataset were used to show a difference between attributes of the upper and lower cultural levels included in this study. This shift occurred somewhere in the vicinity of cultural levels three through six. These datasets speaks to an increase in metal cutmark instances in the upper cultural levels occurring contemporaneously with a decrease in lithic amounts in these same levels. These datasets likely point to the influx of new items and technologies into the region including projectile points, knives, and other metal tools. The discovery of metal cutmarks on the Vore bones indicates that these items were present and in use at the Vore site during the Protohistoric and Historic periods.

These new tools augmented traditional lithic technologies and were used alongside stone projectile points and knives through the final use of the site. The co-occurrence of traditional lithic and new metal technologies should not be considered unusual as the adoption of new tools and technologies is not believed to have immediately replaced existing technologies (Rosen 1984:504). Rather it is believed that existing tools and technologies would continue to see use until new items and technologies became readily available at an affordable cost in sufficient numbers to meet a group's needs (Greenfield 1999:807).

During this transitional period the Vore data suggests that not only were tribal groups hunting and butchering bison in similar ways in the Late Prehistoric, Protohistoric, and Early Historic periods but that the general subsistence practices of the tribes remained in place as well. This continuity in practice is seen elsewhere as investigations on the Northern Plains in Canada found that even as "traditional techniques were undergoing modification they were not altogether abandoned" and that even as the material culture in the region had been greatly altered the bison hunting practices persisted into the Protohistoric period (Vivian et al. 2005). It is likely that, much as Binnema (2001:114-115) postulated, Euroamerican trade goods at the Vore site primarily served to ease native subsistence without transforming existing cultural institutions.

CONCLUSION

For more than a century researchers have been debating the manner in which Euroamerican items and cultural institutions impacted indigenous cultural systems. Some have found that this contact was a transformative and decisive moment in native histories while others believe that these foreign phenomena have only helped to develop or enrich already existing cultural traits. While there is no denying that native cultural systems did in fact change from first contact with Euroamericans to the late Historic period, the nature of that change deserves further evaluation.

As part of this re-evaluation this article investigated the manner in which native subsistence systems were impacted by the introduction of Euroamerican goods and technologies

during the Protohistoric and Early Historic periods. Subsistence systems were chosen as the level of analysis due to the relationship between subsistence and a number of other cultural systems including economic and settlement practices. The Protohistoric and Early Historic periods were chosen as the periods of study so as to be able to control for the number of variables impacting indigenous populations. At this time, even when Euroamerican goods were relatively abundant, Euroamericans were not. This removes transformative pressures such as missionization, militarization, settlement pressures, and disease from the equation allowing for a more direct analysis of the manner in which Euroamerican items and technologies impacted Native American communities.

To approach this question the bison bone beds at the Vore site were analyzed. The Vore site was a bison jump used from approximately A.D. 1500 to A.D. 1800. Site use ranged from the Late Prehistoric period into the Historic period allowing for an inter-site investigation of bison hunting, butchering, and transport strategies over time. As bison were central to the Plains tribe's subsistence strategies during this period the site provided a tailor made dataset from which to base this type of investigation.

The analysis of the Vore data provided two apparently anomalous datasets. Comparative MNI data, mandible butchery patterns, longbone marrow processing, cutmark and chopmark location patterns, seasonality, and the spatial distribution the bones within each cultural level spoke to a continuity in site use over time. This conclusion stood in contrast to three lithic and one cutmark dataset which revealed a change in the attributes between the upper three to six cultural levels and those sitting below. However, when this information was evaluated in relation to current theoretical approaches investigating continuity and change in post contact settings the apparent difference between datasets can be rectified. This work understands that changes to

material assemblages do not necessarily reflect changes to indigenous cultural systems. Of interest is not that there is change to material assemblages, but what this change means.

At Vore the change in the lithic and cutmark data reflects the integration of metal tools into native assemblages. The question then is how does this change in material culture relate to larger cultural systems, in this case subsistence practices. Continuity in element analysis, seasonality, and spatial distribution all speak to a continuation of hunting, butchering, and transport strategies by the indigenous groups who used the Vore site. These findings suggest that, at least during the Protohistoric and Early Historic periods, indigenous subsistence systems remained intact and foreign items and technologies, rather than acting as transformative agents, were integrated due to the benefit that they could provide.

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CHAPTER 3

RE-EXAMINING CONTINUITY AND CHANGE IN NATIVE CULTURAL SYSTEMS ON THE HIGH PLAINS AND ROCKY MOUNTAIN REGIONS OF THE WEST DURING THE PROTOHISTORIC AND HISTORIC PERIODS

When examining Native American/Euroamerican interactions from the 17th through the 19th centuries often the focus is on the impact that Euroamerican technologies, institutions, diseases, and individuals had on indigenous systems. Frequently this research measures these impacts in the corresponding level of cultural change within native systems. Recent work has begun to re-examine the idea of cultural change envisioning the process as multi-faceted with cultural change and continuity being inextricable intertwined. This work understands that all cultures change with time, and perhaps this change strengthens traditional cultural worldviews and allows for indigenous populations to persist in locations and eras rife with economic, demographic, and environmental shifts.

This paper builds on the analysis in the previous two chapter which, through an examination of the impact of Euroamerican goods on Native American cultural systems prior to the movement of large amounts of Euroamericans into the region, found there to be a general continuity in indigenous burial and subsistence practices during the 17th, 18th, and 19th centuries on the High Plains and Rocky Mountain regions of the West. This chapter will integrate this analysis with a re-evaluation of the impacts that the introduction of the horse and the fur trade had on native societies. This work looks to add to the ongoing discussion on the nature of

cultural change and continuity among indigenous populations in the region during the Protohistoric and Historic era in the American West. While the level of analysis is the High Plains and Rocky Mountain regions this study is also applicable to other regions of North American as well as other studies examining issues relating to cultural change and cultural contact.

A BRIEF HISTORY OF CULTURAL CONTACT STUDIES

Anthropological studies on the processes, methods, and implications of cultural contact have been ongoing for nearly 150 years. While the conceptualization has changed with time, the importance of these encounters has never been questioned. Initial work considered cultural contact a one sided process in which cultural ideals, values, technologies and materials were forced upon indigenous populations by the dominant culture or naturally adopted through time by native peoples (Turner 1891; Turner 1893). These scenarios, explicitly or implicitly, consider the dominant culture superior; view the transmission of cultural ideals, values, technologies, and materials unidirectional; and represent native people as agentless players in this process (Sleeper Smith 2009).

A century of re-evaluation of culture contact events by historians, anthropologists, archaeologists, and other social scientists has led to the conceptualization of cultural contact as complex and varied processes. Researchers now understand that indigenous peoples are not passive actors in these events, cultural transmission works both ways, and that both groups are

influenced and impacted by contact. Over the last 30 years projects examining cultural contact have come to focus on the actions and ambitions of both social groups and the role they play in shaping contact period events (Bhabha 1996; Ewers 1997; Hall and Kardulias 2011; Lightfoot 1995; Naum 2010; Rothschild 2003; Sahlins, 1985; Silliman 2001; White 1991; Wolf 1982).

Contact studies in the West have traditionally focused on the fur trade and American western expansion, albeit with very different interpretations of events. Early work presented a narrative glorifying the exploits of hardy, entrepreneurial trappers, traders, and emigrants exploring and claiming territory in preparation for the eventual settlement of a region (Sleeper Smith 2009:xvii).

The response to these interpretations envisions a past where traders and trappers acted as exploitative agents corrupting and destroying indigenous cultures. These Euroamerican agents forced foreign goods on native peoples and compelled indigenous groups to enter into exchange networks with which they are unfamiliar; ultimately leading to the disruption of traditional indigenous lifeways and the destruction of the native culture itself. This interpretation falls into the trap of overemphasizing the importance of the dominant culture and ignoring the agency of indigenous groups.

Today it is understood that neither of these explanations provide an acceptable theoretical framework from which to examine contact in the West. In light of this, modern researchers not only recognize that Native populations have unique histories and social, political, and economic systems but they seek to understand how these histories influenced indigenous interactions with Euroamericans. From this perspective, building on Richard White's (1991) conceptualization of the Middle Ground, culture contact processes are now considered places and times of cultural

negotiation, translation, and remaking between two or more groups and understanding indigenous histories, motivations, and actions has become an important part of contact studies.

Even as the conceptualization of contact studies evolves researchers continue to focus on the impact that Euroamericans have on native populations (Ware 2010:vii). In some cases the actions, institutions, and agency of the indigenous groups is sometimes ignored or marginalized. Additionally, Euroamerican technologies, diseases, and political institutions can be viewed by some as overwhelming to less complex native cultures (see Mitchell and Scheiber 2010 and Sleeper Smith 2009 for a more robust discussion on the critique of modern analysis of cultural change). Contact with Euroamericans or the introduction of Euroamerican goods is described as having led to "drastic changes in the lifestyles of most tribes" (McCabe et al. 2010:48), bringing about "dramatic changes for the Plains groups" (Brink 2008:246), and as having "far reaching effects" which "transformed the lives" on plains cultures (Fowler 2003:35-36). Many of these works add greatly to our knowledge of the past, but in describing native cultures as such they can implicitly re-inforce the century old narrative that indigenous populations were "overwhelmed" by Euroamerican technologies, ideas, diseases, or populations and that these same native cultures were eventually destroyed.

The idea that native cultures were being destroyed or replaced by Euroamerican cultural values and institutions dates back to the 19th century. As early as the 1840s politicians, Indian agents, newspapers, academics, and even the trappers, traders, and explorers familiar with the tribes in the region were bemoaning the loss of indigenous cultures in the American West. While traveling through the West in 1846 Francis Parkman recounts a companions lamentations "that a time would come when those plains would be a grazing country, the buffalo give place to tame cattle, houses be scattered along the water-courses, and wolves, bears, and Indians be numbered

among the things that were" (Parkman 2008). The passing emigrant trains and the encroachment of civilization were the harbingers of change from Parkman's perspective, a concept that was shared by Thomas Fitzpatrick, a trapper, explorer, guide, and Indian agent. In the 1850s Fitzpatrick, working as an Indian agent, wrote how emigration had desolated and impoverished the tribes in the West in a plea to the United States government to provide assistance to these tribes who he believed could no longer provide for themselves (Hafen and Young 1938:178). Building on this, Henry C. Yarrow, an academic under the employ of the Smithsonian Institute, wrote in 1881 that "the primitive manners and customs of the North American Indians are rapidly passing away under influences of civilization" (Yarrow 1881:91). This idea that native cultures were being destroyed or swept away by the advance and influence of civilized Euroamerican lifeways and ideals had become commonplace by the 1880s and influenced academic interpretations of Native American/Euroamerican relations from the contact era in North America and beyond.

When speaking of the advancement of civilization into the West and as a result, from his perspective, the loss of native cultures and the unbridled wild nature of the region Parkman states that "We were no prophets to foresee all this; and had we foreseen it, perhaps some perverse regret might have tempered the ardor of rejoicing". Today this idea of regret manifests itself in the need to identify the individuals, processes, and events that resulted in the destruction of native cultures. Ewers find that:

"Many writers appear to think that we must find a scapegoat for the sad plight of the Indians in the West. If it is not the fur trader who introduced new and fatal diseases among the Indians and

encouraged them to destroy the very wildlife on which they depended for a livelihood; or the missionary, who sought to destroy the Indian's traditional religious beliefs, or the soldier, who pacified the Indians and broke their aggressive spirits, or the inept or dishonest Indian agent, who cheated the Indians or misled higher officials as to their progress toward civilization, then who was it? Ah, surely, it was the settler, whether miner, cattleman, farmer, or town builder, who took from the Indian what little he had left-his land" [Ewers 1997:16].

This tendency to place blame on a variety of Euroamerican agents for the transformation, disruption, corruption, and/or destruction on indigenous lifeways can still be found, implicitly or explicitly, in the writings of some modern scholars (Brink 2008:246; Fowler 2003:35-37; Fowler 2006:5; Klein 1993:156-158; Levy 2001:907; McCabe et al. 2010:48; Moore et al. 2001:863; Washburn 1988:1).

REASSESSING NATIVE CHANGE

The examination of native cultures from the prism of how native life was changed as a result of Euroamerican contact ultimately has unintended real life repercussions by inadvertently giving credence to the idea that native cultures today are something less than their ancestors, as their culture or their traditional lifeways have changed to such an extent that they are no longer to be considered legitimately "native". Silliman (2009:213) finds that "Native American

communities continue to be judged by private citizens, government officials, anthropologists, and the media based on how much they have changed or not changed, and these judgments directly impact issues of authenticity, sovereignty, land, and other aspects of their everyday lives". Mark Tveskov (2007:1-2) supports this argument as he finds that Native American economic development, political activism, and cultural identity often involves a reconstitution of traditional cultural practices by referencing oral traditions and active participation in historical, anthropological, and archaeological academic research. Often Euroamerican society contests this process of reconstitution and questions the legitimacy of indigenous social identity. Research focusing on how Euroamerican institutions change native cultural practices provides an aura of respectability to modern criticisms of native "authenticity" and questions regarding the validity of indigenous claims to connections with their past.

The impact that modern academic investigations have on American/Native American relations appears not to have been lost on a few modern researchers. As early as 2001 Theodore Binnema (2001:3, 16) was cautioning against framing cultural contact processes as events involving cultural clash, cultural change, or cultural continuity. More recently researchers have begun to re-analyze Euroamerican/indigenous contact events and processes through a re-definition of how continuity and change can be evaluated in native systems. This work has found the two to be inter-related with change to be an integral part of how groups maintain continuity in cultural systems including social, political, and religious institutions (Scheiber and Mitchell 2010; Silliman 2001; Silliman 2009; Stahl 2012; Tveskov 2007; Vitelli 2009; Vitelli 2011). This work does not seek to deny the change that can be observed in native systems from the 17th through the 19th century, rather it looks to re-assess the manner in which this change is evaluated.

Change in Native Systems

While there were undoubtedly changes to the Plains cultures during the early contact period, change may have been the norm in in this region. Environmental shifts began as early as A.D. 1400 during the climatic episode called the Little Ice Age when cooler, possibly wetter conditions disrupted agricultural activities and improved hunting and foraging conditions (Bamforth 1988:74; Frison 1967:227-229; Sutton 2004:3). This in turn contributed to settlement and subsistence changes for some indigenous populations through the Late Prehistoric period as some horticultural and agricultural groups began to rely more heavily on bison hunting. This shift in subsistence practice occurred concurrently with a transition from semi or full time sedentary village habitation towards a more mobile lifestyle.

Bison hunting led native populations onto the plains and into new territories by the middle of the Late Prehistoric period. By the 18th century Euroamerican goods, including the horse and the gun, were introduced into this shifting landscape to be followed by Euroamericans themselves in less than a century. These events created an ever evolving indigenous world in the Rocky Mountain and High Plains regions of the West marked by tribal migrations, climatic shifts, and changing subsistence and settlement patterns. Modern researchers have been investigating and documenting these developments for over 100 years. Yet, at least from a western academic perspective, contact with Euroamerican agents continues to be widely considered the most important event in Native American histories as this is often found to be the point at which their histories and cultures were forever altered or destroyed (Binnema 2001:6-10; Harrod 1995:1-17; Silliman 2012:113).

Many of the works examining the consequences of Euroamerican contact on native cultures focus on how the introduction of the horse or the development of the fur trade influenced and changed indigenous institutions such as native social or political organization; warfare and raiding practices; kinship systems; marriage practices; religious beliefs; and traditional subsistence and economic activities (Abel 1939:72; Fox 1976:7; Hans 1907:25; Humfreville 1903:335; Jablow 1951; Lewis 1942:39; Madsen 1980:18; Moore 1987:138-139; Secoy 1953; White 1978:322).

Work examining the introduction of the horse to native communities has found this event to have led to change in a range of native cultural institutions. Clark Wissler found as early as 1907 that the horse was at least partially responsible for the migration of native groups onto the Great and High Plains. In 1914 he goes further in stating that "no important Plains traits except those directly associated with the horse seem to have come into existence, the horse is largely responsible for such modifications and realignment as give us the typical Plains culture of the nineteenth century" (Wissler 1914). The typical Plains culture of which Wissler speaks consists of a mobile, horse culture that is heavily invested in bison hunting, warfare, and raiding (Fox 1976:5-7; Madsen 1980:18; Secoy 1953). Researchers have attributed the abandonment of sedentary or semi-sedentary horticultural to agricultural lifeways in favor of mobile bison hunting practices; the increase in raiding and warfare for the purpose of obtaining horses, slaves, and territory necessary for the intensification of bison hunting; and a resulting increase in political and social complexity, as a means of organizing and controlling raiding and hunting activities to the introduction of the horse. They find that the horse provided a logistical advantage to tribes that had them and placed those groups without at a decided disadvantage, making it almost compulsory that they acquired the horse.

Alongside the horse, fur trading activities are also considered to have influenced Native American cultural systems. Jablow (1951:v) finds that the economic activities of Euroamericans had a transformative effect on indigenous populations. Contemporary writers in the 19th century indicated that they believed that while tribes could easily do without Euroamerican goods, should they be made to believe these new goods were necessary there would be no trouble in enticing indigenous groups to engage in fur trapping activities for the purpose of trade (Abel 1939:72). As the importance of Euroamerican/Native American trade increased it would become the primary means by which indigenous social organizations were ordered. This new social ordering, or so goes the thesis, allowed for the surplus production and exchange of goods, the creation and management of complex alliances, the organization and implementation of raiding and warfare expeditions, and the centralized authority necessary for all of these enterprises (Jablow 1951:vi). Many of these traits are also often identified as typical traits of traditional Plains cultures.

Native Group Identification in the Prehistoric and Historic Periods

The introduction of the horse and other Euroamerican items through the fur trade undoubtedly influenced native society. The issue at hand is to what degree? The theses listed above often find the introduction of Euroamerican goods and institutions to have been the primary cause in the transformation of Native American cultural, social, political, economic, and religious systems. However as was discussed above the High Plains and Rocky Mountain regions of the West had seen environmental and demographic changes since at least the beginning of the 15th century. In light of this it is likely that Euroamerican trade goods were simply another foreign introduction into a region rife with change. The question then becomes not how

Euroamerican technologies transform native cultures, but how Euroamerican technologies were adapted and integrated into native systems.

When examining the interplay between native lifeways and Euroamerican goods it is common to identify artifacts as native, Euroamerican, or hybrid (Silliman 2009:213). In many cases this classification system is used to identify people, ideas, and institutions in contact period studies as well. However this is really a modern construct applied to historic and prehistoric peoples, events, and processes rather than a reality as understood by indigenous populations in the Late Prehistoric, Protohistoric, and Historic eras.

It is unlikely that native peoples in the 17th, 18th, and 19th centuries organized their world according to these native, Euroamerican, and hybrid categories. The idea that Native American/Euroamerican relations were central and important issues to contemporaries in the region during the Protohistoric and Historic periods is a result of our current understanding of events in the late 19th century and beyond relating to the ultimate outcome of Euroamerican/Native American contact rather than the reality for indigenous communities during this period (Binnema 2001:9-15). It is far more likely that native populations identified in what John C. Ewers (1997:23-24) refers to as a "tribocentric" manner. Indigenous populations did not identify as a collective Native American ethnicity, this is a modern development. Rather, native groups identified collectively according to the family unit, band, village, or tribe with which they lived. Individuals were Crow, Lakota Sioux, Cheyenne, Shoshoni, Kiowa, Plains Apache, or Arapaho. Everyone else was simple part of the "other", or an outsider be they friend or enemy. This manner of group identification was prevalent in the West until the last half of the 19th century. From this perspective Euroamerican goods were simply another foreign introduction into the region as they were likely classified as something "other" or something

coming from outside the immediate group rather than being viewed as something distinctly not Native American.

The ability of native groups to integrate individuals, ideas, technologies, and items from outside their social group is rooted in the political organization of the tribes on the High Plains. Band and tribal networks in the region were fluid, allowing for individuals to leave and even join with relative ease. In this system individuals could freely move between bands of the same tribe which maintained kinship, trade, and marriage relations. Hilger (1952:188) recounts how residence with an Arapaho band resulted in inclusion in that band and that dual band membership was also possible. These connective institutions were not limited to inter-ethnic relations. Groups from distinct ethnic groups or tribes also maintained relationships which allowed for intermarriage, trade, and cooperative hunting and raiding practices.

There is no reason to believe that band fluidity was limited to the exchange of individuals. The same mechanisms that allowed for the integration of an individual who was from the outside would have allowed for indigenous populations to internalize foreign items, ideas, and institutions as well. In defining everything originating from outside of one's cultural group, and maintaining a process for the integration of the foreign into one's culture, it allowed for items such as Euroamerican trade goods, and even the traders themselves in some instances, to be melded seamlessly into a group's various cultural institutions without dramatically changing their worldview or sense of ethnicity.

DISCUSSION

Understanding the impact that Euroamerican goods had on indigenous systems is necessary to completely understand the processes and events that marked the contact era in the American West. Social, political, demographic, and economic changes seen during the Late Prehistoric, Protohistoric, and Historic periods have all been examined (see Bamforth 1987; Bamforth 1988; Becker 2010; Binnema 2001; Frison 1967; Reher 1978; Reher and Frison 1980; Sutton 2004). What could still use more investigation is the impact of the introduction of Euroamerican goods. Exploring the impact that Euroamerican trade goods had on native systems provides yet another data set from which to explore contact processes in the West. To this end, work conducted for this dissertation sought to investigate the impact of Euroamerican goods on native religious and subsistence systems from the Late Prehistoric through the Historic period prior to the large scale movement of Euroamericans into the region.

Burials

Native religious systems were investigated through an examination of the burial practices of the Lakota Sioux, Cheyenne, Arapaho, Crow, and Shoshoni as these were the primary inhabitants of the High Plains and Rocky Mountain regions of Wyoming, southern Montana, western Nebraska, and South Dakota during the Historic era. Twenty one indigenous burials dating from the Late Prehistoric, Protohistoric and Historic periods were examined. Burial form and associated funerary material were recorded and compared to burial traditions seen in Late Prehistoric burials from the region as well as Lakota Sioux, Cheyenne, Arapaho, Crow, and

Shoshoni burial traditions drawn from archaeological evidence, ethnohistoric documents, and tribal oral histories.

This analysis showed that burial forms favored in the Late Prehistoric period were used well into the late 19th and early 20th century. Additionally, traditional Euroamerican burial forms including subsurface burial in coffin, often with a burial shroud, were not commonly adopted by Native American groups until well into the reservation period and after intense missionization. Associated Euroamerican funerary objects often duplicated the form and function of traditional native goods such as tools, weapons, pigments, or items of personal adornment. Items of indigenous manufacture continued to be placed in burial contexts alongside Euroamerican goods.

While the inclusion of Euroamerican goods presents a deviation from previous periods, collectively this body of data shows there to be a strong continuity in indigenous burial practice from the Late Prehistoric through the Historic period. As a culture's mortuary practices and rituals have been found to be related to a group's cosmology, worldview, and spiritual understanding (Gilchrest and Sloan 2005; Rubertone 2001:133) the conclusions of this study provide strong evidence for continuity in native religious belief during the same time period.

Furthermore, when examining the integration of Euroamerican trade goods into native burial systems it appears that these items were used for native activities and given native meaning. Traditional indigenous items commonly associated with burials included shell, bone, stone, or tooth beads; native manufactured pigments; and hide burial wraps were used into the Historic period. During the Protohistoric period these items were joined or replace by glass beads, Euroamerican manufactured pigments, and textile burial wraps. It is likely that these Euroamerican goods served similar purposes as their indigenous counterparts and in doing so

reinforced traditional cultural ideals and worldviews even as they were items of foreign manufacture.

Subsistence

Native subsistence practices were examined through an investigation of the bison bone bed at the Vore site. The Vore site is located in northeast Wyoming in the Black hills. The site consists of a large bone bed at the bottom of a sinkhole. The sinkhole was used as a bison jump by Native Americans from approximately A.D. 1500 to A.D. 1800 (Reher and Frison 1980:xii, 53-59). Twenty two cultural levels, or distinct kill events, are present. As these kill events span the Late Prehistoric/Protohistoric/Historic transition the site provides an excellent venue from which to investigate the interplay between native subsistence and the introduction of Euroamerican goods.

A sample of 82 bison humeri, femora, mandibles, scapula, and metacarpals were examined for metal and stone cutmarks. Metal versus stone butchering marks were used to identify the incipient Protohistoric levels at the site. Comparative MNI data between elements, lithic data, mandible butchery patterns, longbone marrow processing, cutmark and chopmark location patterns, seasonality, and the spatial distribution of the bones within each cultural level were then compared to examine butchery and transport strategies employed at the site over time.

The analysis of the Vore data revealed there to be a general continuity in indigenous use of the site from the Late Prehistoric through the Historic era. Metal and stone tools were used alongside one another for the duration of the site's use. The manner in which bison were killed, processed, and transported also remained the same throughout the site's use. This data suggests

that, at least during the Protohistoric and Early Historic periods, indigenous subsistence systems remained intact and foreign items and technologies, rather than acting as transformative agents, were integrated due to the benefit that they could provide.

Re-analyzing the Fur Trade and the Introduction of the Horse

Just as Euroamerican goods did not dramatically alter or destroy indigenous subsistence and religious practices a deeper investigation of the impact of the horse on native systems reaches these same conclusions. There has been a long and ongoing debate as to whether the horse triggered fundamental changes to indigenous cultures in the West without a consensus amongst researchers (Binnema 2001:86). Proponents of the cultural change theory often point towards shifts in political organization and increases in warfare and raiding during the horse era as proof of the impact caused by these creatures (Secoy 1953:52). The acquisition of horses, especially those taken from an enemy, became a means of acquiring social and political prestige (Frey 1987:21). As a result of this, as individuals sought to elevate their social standing within their cultural group raiding activity increased. Larger horse herds also allowed for an intensification of bison hunting activities, allowing for the production of excess robes for the fur trade and the expansion of tribal hunting grounds made possible through the military advantage the horse provided. The theory goes that as warfare, raiding, and bison hunting increased political organization became more complex as a stronger central authority was needed to organize and manage these activities; gender stratification became more defined as men came to control the hunt and many of the goods procured through raiding and trading; and the idea of individualism and individual property ownership became more prominent as bison hunting

strategies shifted from a village wide endeavor to a more individualized exercise (Fox 1976:5-7; Klein 1993:142; Madsen 1980:18; Secoy 1953).

While undoubtedly there was some level of change to 17th, 18th,and 19th century indigenous populations on the plains it seems unlikely that the introduction of the horse during this period was the sole impetus. For over a century some researchers have found that the characteristic features of Plains social and cultural organization were established prior to contact with Euroamericans or Euroamerican goods, and that these cultural institutions or traits were only incrementally or quantitatively altered (Lowie 1916). An analysis of the history of the Sioux, Cheyenne, Crow, Arapaho, and Shoshoni indicate that this may indeed be the case.

Research examining political organization among the Plains tribes finds that larger, more complex political bodies were seen post horse, developing out of a need to organize and manage complex activities such as raiding, warfare, and bison hunting. However this transition, often seen as the transition from band to tribal levels of political organization, may have happened earlier among some groups. It is believed the Sioux began this process by around A.D. 1300 as individuals aggregated into village clusters formed to facilitate defense and economic cooperation (Gibbon 2003:38-40). Among the Cheyenne the concept of a "Cheyenne Nation" or a tribal political body was likely established between 1720 and 1750 (Kroeber 1983:26; Moore 1987:118, 122, 144). During this period the Cheyenne were at least part time village agriculturalists living between the Great Lakes and the Missouri River. By the mid-18th century the Cheyenne began to acquire the horse in small numbers although they did not abandon their villages immediately. The abandonment of the villages did not begin until the last decade of the 18th century or later and was not complete until the 19th century (Grinnell 1972:32; Hoebel 1978:4-7; Jablow 1951:vi). Given this timeline it appears that the Cheyenne began the process of

tribalization before the acquisition of large numbers of horses, prior to their movement onto the Plains, and in advance of the wholesale transition to a bison hunting economy. Even after the coalescence of the Cheyenne into a tribal society and their movement onto the Plains they continued to live in small family based band units for much of the year, only coming together a few times a year to hunt or trade (Grinnell 1972:97; Moore 1987:174). As the Cheyenne heralded from the same Great Lakes region and engaged in similar settlement and subsistence practices as the Sioux it is likely that the same circumstances that led to tribalization among the Sioux were at work among the Cheyenne.

The Arapaho and Crow also record their origins in the Great Lakes region. Oral traditions indicate that both of these groups were also village agriculturalists that migrated onto the Plains and became bison hunters (Carter 1938:75; Densmore 1936:14; Eggan 1955:36; Elkin 1963:207; Frey 1987:11; Hilger 1952:2; Mooney 1896:954; Smith 1925:47). It is unknown when precisely these groups transitioned towards a tribal level of government. However, an increase in political integration is likely to have occurred prior to the acquisition of the horse. Tribalization may have occurred during the village agriculturalist phase as it did with the Sioux or it may not have occurred until after the migration onto the Plains. Both cultures were active bison hunters prior to their acquisition of the horse sometime after 1730 (Fowler 2006:4; Frison 1967:2; Haines 1938:430). Frison (1967:174-175) finds that bison hunting, even pre horse, would have required a great deal of planning and concentration. This indicates that an elevated level of authority or operational control would have been needed to manage the hunt. In either scenario an increase in political integration would have been seen prior to the introduction of the horse.

However, much like the Cheyenne, the level of political integration is questionable. Kroeber (1983:6) and Lowie (2004:10-11) find that the Arapaho and Crow respectively

maintained semi-autonomous clans or bands that came together only under special circumstances such as dealing with external threats. Much like the Cheyenne, the Arapaho and Crow developed some level of overarching tribal organization that had the ability to manage complex inter and intra tribal relationships involving trade, warfare, and hunting while maintaining more traditional, less complex forms of political organization.

Political integration among the Shoshoni is just as complicated. Some have found that the Shoshoni never attained the degree of social complexity that was seen among other Plains tribes (Fox 1976:7). Still, some researchers believe that a higher level of political organization was reached after the introduction of the horse in order to organize and manage the hunt (Mann 2004:13). The Shoshoni were one of the earliest tribal groups in the region to acquire the horse. Prior to the introduction of the horse around A.D. 1700 (Haines 1938:435) the Shoshoni were organized in small family groups (Siebert 1961:5; Smith 1925:36). During the horse era the band was the primary level of Shoshoni organization (Fox 1976:5). While there was no central authority, there were mechanisms in place that allowed for the coalescence of these bands into a larger body for activities such as communal bison hunts and warfare (Lowie 1924:283). Again as with the Cheyenne, Arapaho, and Crow we see a variable level of political integration based on conditions and group needs. Additionally, much as with the other Plains tribes discussed here we see nothing that indicates that the horse was the impetus for tribalization. It is far more likely that band organization, and the integrative mechanisms that allowed for the coalescence of these bands into larger groups, developed out of small family groups as the Shoshoni transitioned towards a bison hunting economy.

These histories indicate that in some cases tribal organization was achieved pre horse, in others true tribalization never occurred, and in some instances band organization and residence

existed alongside tribal affiliations with higher levels of political integration being exercised only in certain circumstances, often revolving around initiating or responding to hostilities or bison hunting activities. While it is likely that higher levels of political organization did occur during the 17th and 18th centuries these processes had their roots earlier as indigenous populations sought higher levels of operational or centralized planning authority to organize pedestrian bison hunts, deal with external military threats, or manage complex prehistoric trade systems.

An analysis of raiding activity and the concept of individual property among indigenous groups on the Plains will similarly reveal how these concepts had their roots in the pre-horse era and how they were governed by traditional tribal mores. Lewis (1942:46), citing Smith (1938:433), finds that the belief that the introduction of the horse dramatically changed warfare and raiding activity on the Plains is not universally held, nor has it been substantiated in any meaningful way. In many ways this remains true today. Raiding activity was practiced among pre-horse groups on the Plains and continued into the Protohistoric and Historic periods. It has been postulated that raiding activity increased with the introduction of the horse as means of acquiring social or political prestige. It is unclear if this is indeed true. However, it is clear that mounted raiding activity was subject to the same cultural values and belief systems that pre-horse raiding was. Long held tribal beliefs considered acts of valor or bravery to be not only admirable qualities but also necessary traits for leadership (Frey 1987:22; Hilger 1952:190; Lowie 1924:283; Lowie 2004:5, 215; Smith 1925:54; Stands in Timber et al. 1998:50). Some tribes had formalized acts that a man must achieve to advance his status. Among the Crow these acts included touching a live opponent, taking an enemy's weapon during hand to hand combat, stealing a picketed horse from an enemy encampment, and leading a raid (Frey 1987:22; Lowie 2004:5). This list of Crow acts of valor illustrates how horse raiding was integrated into an

already existing pre-horse cultural system that demanded the display of bravery and valor by male members of a society as a means of achieving social and political status. In this manner horse raiding did not represent a new activity but rather it was folded into an already existing value system governing male behavior and the acquisition of status.

Economic ordering within native cultural groups was also regulated during the horse era by cultural values and institutions from the pre-horse period. Some find that horses and the items derived from mounted raiding were individually owned, increasing the level of economic stratification within a given society and placing stress on traditional tribal communal relations (Klein 1993:142). However, the idea of individual ownership was not new to indigenous communities on the Plains. Traditionally, items recovered during raiding activity were considered the property of the individual who obtained them (Klein 1993:142). Additionally, the concept of generosity was important to native communities. These concepts provided a framework for regulating the ownership of items derived from mounted raiding activity. While it is true that articles acquired during raids became personal property there were cultural expectations placed on the owners of these items. It was not the wealth collected during these endeavors that brought respect and prestige but the valor that was required to successfully engage in such activities and the generosity of redistributing their spoils (Champagne 2007:290; Frey 1987:21). In light of this, traditional expectations of generosity worked to limit economic ordering as it had during the pre-horse era by providing a mechanism for the redistribution of material wealth to the rest of the community (Shimkin 1986:316).

Based on this evidence it seems far more likely that the horse, rather than being the impetus for cultural change, was integrated into traditional native activities during the Protohistoric and Historic periods. As part of this process the horse would have not been viewed

as an article of Euroamerican trade; rather it would have been conceptualized as a native commodity. This process of "indigenizing" the horse may have resulted in the acceleration or intensification of traditional native activities, such as raiding and bison hunting, or cultural practices related to social and political stratification. However, there appears to be no reordering of indigenous worldviews as a result of the horse. In fact post-horse political organization was rooted in cultural developments made prior to the introduction of the horse and activities such as raiding and cultural practices relating to social or economic ordering remained subject to beliefs and practices held before contact.

The fur trade has also been associated with significant change in native societies. Jablow (1951:10) finds that "prior to the subjugation of the Plains Indians by force of arms and their subsequent settlement on reservations, the two outstanding events which produced major changes in their lives were the introduction of the horse and the introduction of European goods through the fur trade". Mishkin (1940:1922) describes the interplay between the fur trade, horse ownership, and raiding as cyclical in which each component maintained and accelerated the other. In this scenario tribes with the largest horse surpluses were the most active traders and were compelled to be the most active raiders so as to replenish their stock to engage in future trading. It is believed that as tribes intensified their participation in fur trading activities centralized authority began to develop, individual enterprise became more prominent, the production of surpluses for exchange increased, settlement locations were shifted, and subsistence activities were disrupted as tribes increased their focus on trapping fur bearing animals for trade (Gibbon 2003:76, 90; Jablow 1951:vi, 21).

These changes were made possible by the creation of new needs in native communities through the introduction of Euroamerican manufactured goods such as guns and metal tools that

were perceived as superior to indigenous analogues or were believed to have made native life easier (Jablow 1951:17). Contemporary traders at the turn of the 19th century recount how indigenous populations could easily do without Euroamerican trade. However, the "spirit of imitation, rivalry, and the idea of luxury" would create the "need" for these items within a society, and this need would compel the tribes to participate in trapping, fur preparation, and trading activities (Abel 1939:72; Klein 1993:143-144; Kurz 1970:149).

The premise to this argument is that indigenous populations were induced to participate in fur trading activity through the lure of superior Euroamerican products. The draw was so great that native tribes reorganized their settlement practices, subsistence practices, and methods of social and economic ordering as they began to produce excess goods for exchange to facilitate their participation in a global market economy. Much like the previous analysis of the horse there are certainly kernels of truth in these findings. It would be naïve to believe that the introduction of new products and exchange networks would have no impact on indigenous cultural systems. However it would be equally naïve to assume a monocausal process in which Euroamerican goods and exchange systems solely allowed for the reorganization of traditional tribal systems. Rather, much like the horse, Euroamerican goods and exchange systems were integrated into native belief systems and institutions and any resulting change to indigenous systems is likely rooted in pre contact conditions and managed by traditional tribal mores.

Any re-analysis of the impact of Euroamerican/Native American fur trading activities in the West should begin with the understanding that not only were indigenous groups familiar with trading activity, but they were savvy traders with a complex understanding of the value of their furs and Euroamerican goods. Indigenous populations on the High Plains and in the Rocky Mountains were participants in long distance trade networks connecting the region to the

American Southwest, the Pacific Northwest, the Great Lakes region, and the Northern Plains in Canada as well as local exchange systems with other native groups for centuries before Euroamerican contact (Barbour 2000:7; Ewers 1954:429; Mathews 2008:47, 54; Vehik and Baugh 1994:249; Wood and Thiessen 1985:4-5).

The tribes were also well aware of the strength of their position in Euroamerican/Native American trade relations. They were not indiscriminate trappers and traders going to any lengths to obtain the desired furs and then trading them for what Euroamerican goods were available. Native traders understood the value of their labor and of the Euroamerican goods for which they were trading and sought to obtain a good market value during negotiations (Innis 1962:109-110; Sleeper-Smith 2009:xxix). As a result indigenous populations would refuse to collect furs if the prices being offered were too low, the risks of trapping too high, or if the goods being traded were of inferior quality (Ewers 1997:33; Ray 2009:334; Sleeper-Smith 2009:xx, xxix). Many groups even requested specific items, the nature of an item's attributes, and the desired style and design of exchange goods (Ray 2009:334-336; Sleeper-Smith 2009:xxxviii).

Additionally, the tribes would refuse to collect the pelts requested if they did not fit into already developed native worldviews or seasonal rounds. Contemporary traders recount how in the late 18th and early 19th century Plains tribes such as the Lakota Sioux and Cheyenne were not considered valuable trade partners as they often focused on hunting bison rather than the beaver (Abel 1939:162-163). At this time beaver pelts brought high prices while the bison robe trade had yet to become the profitable endeavor it would by the mid-19th century. Tribes on the Great, High, and Northern Plains relied heavily on bison meat, hides, and other byproducts for survival. Traders in the region found that these groups could not be compelled to shift their subsistence activities towards a beaver hunting ecology as they were unfamiliar with hunting this animal,

they did not reside in a region where these animals were plentiful, and they did not value Euroamerican goods enough to dramatically change their area of residence and favored subsistence activities. Neither would tribes engage in trapping activities if it did not fit within existing native mores. Charles Mackenzie, a Northwest Company trader, reports that at the beginning of the 19th century Mandan leaders, while living in a region with plentiful beaver, refused to engage in beaver trapping as they considered searching for these creatures in "the bowels of the earth to satisfy the avarice of the Whites, not only troublesome but degrading" (Masson 1889:331). Even tribes such as the Crow who did engage in beaver trapping did not dramatically alter their subsistence activities or abandon traditional indigenous trading activity with the Missouri village tribes such as the Mandan and Hidatsa to accommodate the fur trade (Voget 2001:697). As the bison trade developed in the 19th century many of the bison hunting tribes were eager to participate as bison hunting and robe preparation were activities with which the tribes were familiar and engaging in the robe trade would easily be integrated into existing native activities and worldviews.

While Euroamerican goods acquired through trade were quickly integrated into native lifeways, they did not in all cases rapidly replace existing technologies. Lithic, hunting, and warfare technologies including the bow and arrow remained in use from the 17th through the 19th century (Hyde 1959:132; Lowie 2004:xix). Native clothing materials and styles remained in use into the reservation period even as Euroamerican counterparts were readily available and traditional native foodways were maintained into the late 19th century by many groups (Lewis 1942:37). Additionally, items perceived by Euroamerican traders to be superior to their indigenous counterparts were never accepted into native society. Articles such as lightweight metal shields with the ability to stop musket balls were never adopted by the Plains tribes in spite

of their clear functional advantage due to the spiritual nature of the indigenous leather counterparts (Ewers 1997:52). There are a number of reasons for the persistence of indigenous items and technologies and the failure of Euroamerican analogues to be adopted. In some instances indigenous technologies persisted because Euroamerican analogues were not readily and constantly available. When Euroamerican items could not be replace, repaired, or manufactured by indigenous populations it would be common to maintain the ability to produce the native counterpart for instances when resupply was not possible. The ability for a Euroamerican item to be easily integrated with native practices, beliefs, and worldviews would also have figured prominently in the adoption of these articles.

Much like the horse, Euroamerican trading activity in the West was integrated into traditional native activities, institutions, and cultural processes. Trading activity carried a deeper meaning than a simple economic exchange to native cultures on the Plains. To the tribes, trade relations not only allowed for the procurement of foreign items but were integral in maintaining interpersonal and intertribal relationships which in turn allowed for the maintenance of alliances, the exchange of marriage partners, the exchange of information, and the mediation of disputes. As such, trade not only required familiarity between both sides but it was governed by codes of conduct and ritual practices. Euroamerican traders would have been subject to the same rules regulating this activity as native participants. They would have participated in the same gift giving and pipe smoking rituals as native traders and often married into a tribe to create the bond necessary to maintain a reliable trade relationship.

Just as indigenous exchange practices failed to change with the introduction of Euroamerican items it also seems unlikely that settlement and subsistence were drastically reordered to fit the demands of Euroamerican traders. Many of the Plains cultures were already

mobile prior to contact. In the cases of the Lakota Sioux, Cheyenne, Arapaho, and Crow these groups were moving west, away from established trading locations. The participation of these cultures in the fur trade in any meaningful way did not begin in earnest until the development of the bison robe trade. The implication being that participation in the fur trade en mass only began when the object of interest overlapped with existing subsistence practices and mobility patterns of the tribes. While to some degree a shift towards production for exchange would have been necessary to accommodate the posts, kin based systems were still important and economic ordering would have been limited by the same beliefs and practices at work with horse raiding. Again, as with the horse, we do not see a dramatic reordering of native beliefs and lifeways as a result of the introduction of the fur trade. Rather trading activity was integrated into existing native activities, conducted according to traditional native practices, and governed by existing indigenous beliefs and mores.

A Re-Analysis of Contact on the High Plains and in the Rocky Mountains

The previous section provides a re-analysis of the impact that Euroamerican items and institutions had on native systems. When examined as a whole, the findings above allow for a more complete re-analysis of issues relating to change and continuity in native cultures on the High Plains and Rocky Mountain regions of the West during the 17th, 18th, and 19th centuries.

Mitchell and Scheiber (2010:2-3) define four guidelines that researchers should consider when examining the relationship between native cultural change and Euroamerican contact. Researchers should not take indigenous change as a given, portray Native Americans as primitive environmentalists, assume that native technologies were quickly and completely

replaced by Euroamerican items, or implicitly or explicitly assume the inevitable corruption, destruction, or collapse of indigenous cultures.

Additionally, archaeological investigations of change must apply diachronic research in order to understand the native condition prior to, and after contact (Lightfoot 1995; Mitchell and Scheiber 2010:11; Silliman 2012:113; Tveskov 2007). Diachronic studies allow researchers to more fully understand the long term implications of intercultural contact through an examination of the manner in which pre contact indigenous cultures responded to change (Lyons and Papadopoulos 2002:1-2).

However, before these concepts can be applied we also need to address the manner in which continuity and change is identified in the archaeological record. Stahl (2012:159) finds that archaeologists identify discontinuities in material culture as an indication of cultural change while stability in material culture through time reveals continuity in cultural practice. Additionally, she makes note of how change has traditionally been the focus of archaeological analysis with the identification and discussion of continuity being a less compelling, and thus less frequently covered issue. Part of the issue in using material culture as a metric from which to discuss cultural change and continuity comes from the manner in which we classify archeological material. Silliman (2009:213) defines three categories into which all material recovered from contact era sites are placed: native, Euroamerican, and hybrid. Native items include ceramics and lithic technologies; Euroamerican goods can consist of items such as metal pots or certain cloth types; and hybrid objects are items of Euroamerican manufacture that have been reworked by indigenous peoples such as glass bottles that have been flaked into a tool or metal strapping that has been cut and shaped into an arrow point. These categories are not only used as a means of classifying material on site forms and for curation but they often provide a

basis for the conceptualization of these items by researchers. As these categories are held to be true all analysis begins from this point. In light of this it is hard to envision a scenario in which native communities would not be seen as having changed as the incorporation of Euroamerican items shows discontinuity in the material culture of a cultural group.

Hodge (2005) cautions that the integration of Euroamerican items by indigenous populations should not be seen as a blanket indicator of acculturation or cultural change but rather could be indicative of mimicry, hybridization, or the appropriation of cultural forms. In fact there are a multitude of ways that items of Euroamerican manufacture can be used in contact settings. These items can be used as a way of making Euroamericans feel more at home, a means of enforcing assimilation, raw material sources for indigenous populations, a method of substantiating trade between two groups, replacements for indigenous technologies, and as a way to feed families (Silliman 2009:216). This list is not exhaustive but it illustrates the range of functions that foreign technologies can serve in contact settings.

Recent work examining cultural continuity and change has taken these issues into account. As early as the 1980s researchers realized cultural contact, even in situations in which Euroamerican agents attempted to generate change in indigenous cultures, often resulted in innovative responses by native populations which reaffirmed native cultural systems (Roseberry 1989; Sider 1987:11). Building on this archaeological investigations began to examine how foreign items, technologies, and ideas were integrated into native cultural and ideological systems in ways that reinforced or redefined these indigenous institutions (Lightfoot 1995; Wilson and Rogers 1993). This work has culminated in recent analysis into how indigenous populations have maintained, innovated, and reinvented their cultural identity during the contact era (Tveskov 2007:431). In doing so, changes to cultural practices or cultural systems are often

internalized and culturally ordered in such a way so as to reinforce or reinvent what are believed by indigenous groups to be traditional lifeways. This mechanism for responding and adapting to any number of external pressures allows cultural groups to not only exist but flourish in contact era settings without losing their sense of a shared cultural identity (Hodge 2005; Prince 2002; Rubertone 2001; Silliman 2009; Tveskov 2007).

This understanding of the interplay between cultural continuity and change needs to be applied to indigenous cultures from the American West. Wendy Sutton (2004) provides a starting point for this type of investigation. Sutton evaluates how changes to social and economic organization among indigenous populations on the High Plains of the American West were influenced by changing environmental/climatic conditions, demographic shifts initiated by migrations of foreign native groups into the region, and the introduction of Euroamerican technologies and economies during the Late Prehistoric and Protohistoric periods. She finds that researchers can provide explanations for shifts or discontinuities in indigenous systems based on one of the aforementioned conditions while not fully considering other influencing factors. Rather than focus on one issue, this work examines the relationship between environmental, demographic, and economic factors and provides a multivariate model for examining cultural change in native systems on the shifting landscape on the High Plains during the Late Prehistoric and Protohistoric periods. Sutton finds that "through a combination of cultural resistance and a maintenance of native agency, changes in economic activities and accompanying social changes were negotiated within existing and adaptive native value systems" (Sutton 2004:14, 289). Sutton makes advances in the evaluation of contact processes in generating a diachronic study which incorporates a number of pressures which would have influenced the actions of native groups.

This paper builds on Sutton's work through the examination of indigenous burial and subsistence practices and through a re-assessment of academic discourse on the impact of the horse and the fur trade on native systems. This study employed a diachronic approach focusing on the impact that Euroamerican technologies and institutions had on Native American cultural systems in the post contact period. This analysis was integrated with data referencing indigenous cultural practices during the Late Prehistoric period so as to provide an understanding of native cultural practice prior to the influx of these foreign goods and institutions. Specifically Lakota Sioux, Cheyenne, Arapaho, Crow, and Shoshone burial and subsistence practices were examined with an eye towards identifying changes and/or continuity over time. The results revealed that while there were superficial changes in material culture, caused by the integration of Euroamerican items, there was remarkable consistency to burial practice, religious belief, and basic subsistence over time. Euroamerican goods were integrated into native systems, used in native ways alongside traditional indigenous technologies, and reworked to fit native forms. Additionally, these items were given native meaning and governed by traditional indigenous belief systems. A re-analysis of the introduction of the horse and the Euroamerican fur trade returned similar results. Careful analysis shows that the horse, fur trading activity, and the trade goods that accompanied them were internalized by the tribes and blended with traditional activities, worldviews, and cultural mores by indigenous populations to reinforce, rework, or re-imagine native systems as a means of responding to changing external environmental, demographic, and economic pressures.

Now it should be understood that I do not attempt to deny the presence of changes in indigenous cultures in the American West. However, it bears mention that these cultures always differed in some way from their predecessors. Groups like the Lakota Sioux, Cheyenne,

Arapaho, and Crow transitioned from mobile hunter/gatherers to relatively sedentary horticulturalists to the mobile Plains hunters Euroamerican travelers encountered in the 17th, 18th, and 19th centuries. During this period these groups encountered climatic changes, demographic pressures as a result of Native American population movements, a shifting political and diplomatic landscape caused by the influx of Euroamericans and migrations by indigenous populations, the breakdown and creation of indigenous trade networks, and the introduction of epidemic disease, foreign items and technologies, and new trade systems. These pressures began as early as A.D 1300 and continued for the next seven centuries. Situated in this historical landscape, it becomes far more likely that rather than being identified as decisive moments in tribal history, the arrival of Euroamerican items, technologies, trade systems, diseases, and individuals were simply processed by indigenous groups as another in a long line of foreign items and institutions to be dealt with.

This conceptualization of native history builds on Silliman's work identifying cultural change and continuity as being inter-related issues. Furthermore, traditional scholarly work defining Native American/Euroamerican relations in terms of how indigenous groups changed or remained the same is likely more representative of modern theoretical perspectives than the perceptions and interests of these cultural groups. Tveskov (2007:431), citing Haley and Wilcoxon (2005), finds that culture is not "static or reified"; rather it is "continually reinforced and contested by individuals during the negotiation of structured social relations through the innovative use of learned and shared cultural practices". He continues by relating how this process works to reinforce, change, or establish new cultural institutions, precedents, and beliefs that mold the experiences and identity of the existing and future generations (Tveskov 2007:431).

Herein lies the interplay between continuity and change. The introduction of new ideas, items, and institutions by their very nature reflect change to a given region or society. Further change can be achieved through a group's reaction to, interpretation of, and/or integration of these items, events, or processes. This is the change that researchers often focus on. However, this only represents half of the story. Directly related to these changes are how these stimuli are rectified with and governed by traditional cultural beliefs and mores. Harrod (1995:28-29) relates how cultural groups can successfully address foreign threats, novelties, and perceived dangers through established cultural institutions, such as religion systems and/or practitioners that provide mechanisms for the integration and reinterpretation of the foreign. He finds these mechanisms provide creative, culturally appropriate responses that are viewed by those within a culture as being consistent with traditional beliefs, worldviews, and mores. While religious ideology and religious practitioners provide a powerful means of dealing with changing circumstances other indigenous institutions such as familial, band or clan organizations as well as pan-tribal groups would have also provided institutional guidance by a respected cultural authority with the ability to suggest responses and actions to internal and external stimuli that would be perceived as authentic and in line with traditional values by members of that cultural group. This process itself, while embedded with change, constitutes cultural continuity; for as Mitchell and Scheiber (2010:17) state, "continuity is more than the absence of change."

In the West where processes such as militarization, missionization, relocation, and settlement came relatively late, researchers are provided a larger window with which to explore the interwoven dynamic between cultural change and continuity. The processes of militarization, missionization, relocation, and settlement position indigenous populations in direct, sustained contact with Euroamerican people, technologies, beliefs, and diseases. Such contact, especially

in instances where power relations are tilted by military or administrative superiority can increase the rate of cultural diffusion. This is exacerbated in instances where native populations are actively encouraged to adopt Euroamerican lifeways. Governmental and military policy into the 20th century, as well as the intensification of missionization that often accompanied the relocation of native peoples to agencies or reservations, sought to reorganize indigenous familial and political organization, subsistence activity, and religious belief. It is the results of these pressures that can lead many to determine the Euroamerican/Native American contact proved to be a decisive and destructive moment for indigenous populations.

This analysis may not accurately reflect the reality of the situation on the ground during the contact era. The High Plains and Rocky Mountain regions of the West remained "native" worlds until the middle of the 19th century. There were few Euroamericans in the region prior to the movement of overland bound emigrants in the 1840s and the subsequent arrival of American military forces after 1849. On this landscape, Euroamericans in the region had influence as a result of the desired items they exchanged but completely lacked power as their ability to remain in a given area was reliant on the will of the local populations. Tribes could, and did, bar or remove Euroamerican traders from their territories.

In the absence of military subjugation and relocation, epidemic disease, and administrative control by Euroamerican agencies the native peoples of the West were happy to integrate foreign items and ideas that eased the workload and improved the quality of life. However, the integration of Euroamerican ideas, items, and institutions was conducted selectively and only proceeded so long as these foreign introduction could be integrated with or were useful to traditional native activities, were rectifiable with indigenous belief systems, and had the ability to be governed by native mores and worldviews.

CONCLUSION

Early evaluation of contact events in the American West during the Protohistoric and Historic periods found that contact with Euroamerican items, individuals, and institutions was a decisive moment in indigenous histories which inevitably led to the transformation, disruption, corruption, and/or destruction of their culture. New theoretical approaches have begun to reanalyze the manner in which cultural change and continuity within native systems is evaluated. This project examined indigenous burial and subsistence systems on the High Plain and Rocky Mountain regions of the West and integrated the results of this work with a re-evaluation of the impacts of the introduction of the horse and the fur trade on indigenous populations.

This work showed that while there was undoubtedly change to indigenous groups during the Protohistoric and Historic periods these changes belie a deeper level of persistence or continuity within a given culture. Cultures are not static entities but rather they shift or morph over time. We see this among the tribal groups that inhabited the American West on the eve of contact. Many of these groups transitioned from mobile hunter/gatherers to semi-sedentary horticulturalists to mobile bison hunters in response to changing environmental, demographic, and political circumstances. Of importance here is the manner in which group identification persisted in the face of all these variables. Tribal populations in the American West were able to meet, integrate, and validate changes pre and post contact through societal mechanisms such as religious institutions and practitioners; familial, band, and political organizations; and pan tribal

groups which provided a means of understanding and validating change in ways that met with traditional beliefs, worldviews, or mores.

This study finds that the integration of Euroamerican items, ideas, and institutions including the horse and the introduction of the fur trade to have been conducted on native terms. Items and technologies were used for traditional native practices and given native meanings. Euroamerican ideas and institutions were governed by native worldviews and were integrated with and conducted according to traditional tribal mores. Items, ideas, and institutions which provided no advantage to native groups, held no purpose or use in native society, or were not reconcilable with indigenous beliefs were rejected by native populations.

This work builds on recent theoretical developments concerning the investigation of cultural change and continuity in native systems. First, while these conclusions may contradict some previous work it should be kept in mind the parameters of this analysis. This work focuses on native communities prior to the major influx of Euroamericans into indigenous territories and examines regions and populations where missionization had not yet played a major role and a strong United States military presence had yet to be realized. All of these things would come to pass and would eventually lead to more dramatic changes among the tribes. However, this discussion focuses on change and continuity prior to these events. Furthermore, the conclusions put forth in this article are really only applicable to the High Plains and Rocky Mountain regions of Colorado, Montana, Nebraska, and Wyoming**.** Native/Euroamerican interactions show wide variability across time and space and the unique histories of different geographic regions and the indigenous tribes can provide for a significantly different outcome to early contact than I propose for this region**.** Still, the manner in which Native and Euroamerican contact was evaluated in this

article has the ability to add to the discourse on culture contact processes in other times and places.

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APPENDIX A. ASSOCIATED FUNERARY OBJECTS

Site Number	Artifact Type	Number	Manufacture
HR004			
	Unidentified Cloth fragments (5 types)	23	Euroamerican
	Leather strapping fragments	18	Euroamerican
	Unidentified leather fragments	12	Euroamerican
	Iron/Steel buckle	1	Euroamerican
	Iron/Steel fragments	26	Euroamerican
	Copper bracelet fragments	3	Euroamerican
	Complete hot tumbled glass beads	1458	Euroamerican
	Brass buttons with Alpha loop	20	Euroamerican
	Glass four hole pie crust button	1	Euroamerican
	Woven plant fiber fragments	2	Native American
	Stone hide polisher	1	Native American
	Willow twig fragments	27	Native American
HR006			
	Wool fabric fragment	1	Euroamerican
	Complete hot tumbled glass beads	1239	Euroamerican
	Complete copper Bracelet	1	Euroamerican
	Copper bracelet fragments	3	Euroamerican
	Hot humbled glass bead fragments	177	Euroamerican
	Red Hematite	1	Native American
	Leather fragments	11	Unidentified
	Chert flake	1	Native American
	Ignimbrite flake	1	Native American
HR015			
	Unidentified cloth fragment	1	Euroamerican
	Wire nail	1	Euroamerican
	Complete hot tumbled glass beads	1	Euroamerican
HR019			
	Wool coat	1	Euroamerican
	Wool blanket	2	Euroamerican
	Iron bracelet	1	Euroamerican
	Brass buttons	3	Euroamerican

Site Number	Artifact Type	Number	Manufacture
HR019			
	Woven copper band fragment	1	Euroamerican
	Blown glass beads	3	Euroamerican
	Lamp wound glass beads	13	Euroamerican
	Complete hot tumbled glass beads	280	Euroamerican
	Hot tumbled glass bead fragments	37	Euroamerican
	Dentalia necklace beads	5	Euroamerican
	Conch shell hair pipes	3	Euroamerican
HR020			
	Unidentified cloth blanket	1	Euroamerican
	Iron/Steel ring	1	Euroamerican
	Lamp wound beads	5	Euroamerican
	Hot tumbled beads	739	Euroamerican
	Dentalia necklace bead	1	Euroamerican
	Wooden bowl	1	Native American
	Bison robe	1	Native American
	Leather garment	1	Native American
	Leather fragment	1	Native American
HR049			
	Gold plated brass wire	1	Euroamerican
	Oval shell earing	1	Native American
	Wool Fiber fragment	1	Euroamerican
HR051			
	Flintlock Gun	1	Euroamerican
	Powder horn	1	Euroamerican
	Glass Beads	Unknown	Euroamerican
HR056			
	Complete beads of unidentified material and manufacture	40	Euroamerican
	Unidentified bead fragments	5	Euroamerican
	Steel Sanders style buttons	2	Euroamerican
	Unidentified button	1	Euroamerican
	Unidentified fabric fragments (three distinct types)	Unknown	Euroamerican
HR132			
	Hide Garment Fragments	Unid.	Native American

Site Number	Artifact Type	Number	Manufacture
HR139			
	White Hot Tumbled beads	47	Euroamerican
	Printed Cotton Dress	1	Euroamerican
HR188			
	Silk fabric fragment	1	Euroamerican
	Cotton fabric fragments	2	Euroamerican
	Linen fabric fragments	4	Euroamerican
	Unidentified fabric fragment	1	Euroamerican
	Iron/Steel knife blades	3	Euroamerican
	Iron/Steel trade points	2	Euroamerican
	Iron/Steel buckle	1	Euroamerican
	Iron button with alpha loop	1	Euroamerican
	Iron/Steel scraper	1	Euroamerican
	Iron/Steel disc	1	Euroamerican
	Iron/Steel ring	1	Euroamerican
	Iron/Steel strap fragment	1	Euroamerican
	Unidentified Iron/Steel fragments	47	Euroamerican
	Brass button with alpha loop	1	Euroamerican
	Brass tubing fragment	1	Euroamerican
	Copper wire bracelets	19	Euroamerican
	Copper wire springs	4	Euroamerican
	Complete hot tumbled glass beads	7819	Euroamerican
	Glass bottle stopper	1	Euroamerican
	Shell beads	2	Native American
	Elk teeth beads	4	Native American
	Shell pendant	1	Euroamerican
	Shell disk	2	Euroamerican
	Antler scraper	1	Native American
HR188			
	Worked Willow twig fragment	1	Native American
	Copper Oxide pigment	.06 grams	Native American
	Iron Oxide pigment	2 grams	Native American
	Red Ochre pigment	.61 grams	Native American
	Complete tarsus bone bead	1	Native American
	Tarsus bone bead fragments	2	Native American
	Polished Quartzite stone	2	Native American

Site Number	Artifact Type	Number	Manufacture
HR188			
	Polished Andesite stone	2	Native American
	Chert scraper	2	Native American
	Chert biface	2	Native American
	Ammonite stones (Possible Buffalo Stones)	3	Native American
	Unidentified leather fragments	15	Native American
	Unidentified black pigment	4 grams	Native American
	Unidentified white pigment	.59 grams	Native American
HR220			
	Cut velvet fragments	2	Euroamerican
	Unidentified fabric fragments	9	Euroamerican
	silk fibers	5	Euroamerican
	Flax fabric fragment	3	Euroamerican
	Leather burial wrap with sinew stitching	1	Native American
	Unidentified leather fragments	142	Native American
	Leather strap fragments	2	Euroamerican
	Red pigment (possible ochre)	.26 grams	Native American
	Elk teeth beads	240	Native American
HR258			
	Wool fabric fragments	56	Euroamerican
	Wool/Cotton fabric fragments	39	Euroamerican
	Cotton fabric fragments	5	Euroamerican
	Unidentified fabric fragments	5	Euroamerican
	Leather fragments	25	Euroamerican
	Steel buckle	2	Euroamerican
	Steel nail	1	Euroamerican
	Steel ring	1	Euroamerican
	Steel safety pin	1	Euroamerican
HR258			
	Steel/iron fencing staple	1	Euroamerican
	Steel/iron square nail	1	Euroamerican
	Unidentified steel fragment	1	Euroamerican
	Brass buttons with Omega shanks	8	Euroamerican
	Brass buttons with Sanders Shanks	10	Euroamerican
	Brass and Iron military button with a Sanders shank	1	Euroamerican

Site Number	Artifact Type	Number	Manufacture
HR258			
	Brass and Iron military buttons with a Sanders shank and makers mark	2	Euroamerican
	Two piece button of unidentified material with a Sanders shank	1	Euroamerican
	Brass button	1	Euroamerican
	Brass studs	71	Euroamerican
	Brass stud fragment	1	Euroamerican
	Brass bracelets	8	Euroamerican
	Brass safety pins	3	Euroamerican
	Glass beads of unidentified manufacture	5	Euroamerican
	Complete hot tumbled glass beads	4	Euroamerican
	Glass hot tumbled bead fragments	7	Euroamerican
	Spoons of unidentified material	2	Euroamerican
	Glass collar stud	1	Euroamerican
	Chert bifacial core	1	Native American
DB140			
	Complete hot tumbled glass beads	29	Euroamerican
DB141			
	Molded glass beads	4	Euroamerican
DB142			
	Complete hot tumbled glass beads	459	Euroamerican
	Glass hot tumbled bead fragments	8	Euroamerican
	Wound glass bead	1	Euroamerican
	Molded glass bead	1	Euroamerican
Prairie Dog			
	Complete hot tumbled glass beads	3	Euroamerican
	Lamp wound glass beads	3	Euroamerican
	Extruded glass bead	1	Euroamerican
	Lead bead	1	Euroamerican
FC050			
	Wool blanket	1	Euroamerican
	Cotton fabric fragment	11	Euroamerican
	Unidentified fabric fragments	Unknown	Euroamerican
	Leather saddle	1	Euroamerican
	Unidentified leather fragments	10	Euroamerican
	Knife and leather sheath	1	Euroamerican

Site Number	Artifact Type	Number	Manufacture
FC050			
	.22 caliber Whitney Company revolver	1	Euroamerican
	.45-70 rifle cartridges	10	Euroamerican
	Brass beads	30	Euroamerican
	Ornamental brass plate	1	Euroamerican
	Complete brass buttons	44	Euroamerican
	Brass button fragment	1	Euroamerican
	Complete brass stud	2	Euroamerican
	Brass stud fragments	170	Euroamerican
	Unidentified brass plate fragments	13	Euroamerican
	Unidentified brass fragment	4	Euroamerican
	Belt buckle of unidentified metal	1	Euroamerican
	Bracelet of unidentified material	1	Euroamerican
	Unidentified metal fragments	11	Euroamerican
	Button of unidentified metal	1	Euroamerican
	Glass tube beads	27	Euroamerican
	Complete hot tumbled glass beads	212	Euroamerican
	Beaded Moccasins	2	Native American
	Navajo blanket	1	Native American
	Elk tooth beads	58	Native American
	Unidentified tooth beads	4	Native American
WA9			
	Wool fabric fragments	12	Euroamerican
	Printed cotton fabric fragments	7	Euroamerican
	Complete hot tumbled glass beads	546	Euroamerican
	Polished and drilled antelope horn	1	Native American
	Worked wood fragment	1	Native American
	Unidentified native fibers	7	Native American
	Unidentified leather fragments	3	Unidentified
FC10-15-08			
	Complete hot tumbled glass beads	11	Euroamerican
	Pipe fragment	1	Native American