THE LIFE AND DEATH OF BONE:
A REGIONAL APPROACH TO THE INTERPRETATION OF FRAGMENTED AND CULTURALLY MODIFIED ONEOTA HUMAN REMAINS

By

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Anthropology—Doctor of Philosophy

2018

ABSTRACT

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This dissertation utilizes previously collected archaeological, mortuary, and osteological data from multiple village and mortuary sites attributed to the Midwest archaeological culture known as Oneota (AD 900-1700). Isolated and fragmented human remains are commonly encountered in both mortuary and non-mortuary contexts, including burials, refuse and storage pits, and scattered throughout villages and middens. Many of these remains are also culturally modified through processes such as burning, incising, and polishing.

Although research regarding these remains is limited, these deposits have been attributed to violence and/or trophies of war. Therefore, the primary objective of this research was to examine the presence of fragmented and culturally modified human remains at Oneota sites and to theorize their possible meaning(s). This also included an evaluation of previous conclusions of violence. A secondary objective of this dissertation was to assess if published and previously collected data could be used to answer new research questions.

Using spatial and correspondence analyses, this dissertation demonstrates patterning in the presence and location of culturally modified human remains. A contextual approach, as well as a theoretical framework that views the body as dividual and partible, were also used to demonstrate how human remains can become fragmented and isolated. Finally, ethnographies of the Winnebago (Ho-Chunk) and Ioway were used to find historical links between past and historic practices.

This dissertation demonstrates a preference for cranial and long bone elements for fragmentation, as well as cultural modification. The choice of cranial elements is tied to the concept of the location of the soul, while the act of cultural modification is a transformation to either enhance or erase previously identities. Due to the degree of fragmentation, it cannot be precisely determined who specifically was used for this treatment. It is argued that these remains represent an aspect of the Oneota mortuary program that has not regularly been included in previous analyses.

Multiple difficulties in data collection and analysis were encountered, primarily for data regarding fragmented and isolated human remains. Several varying treatments for isolated human remains were noted, leading to difficulty in their analysis and interpretation. Due to this difficulty, suggestions for future data collection for isolated human remains are provided.

ACKNOWLEDGEMENTS

Thank you to my dissertation committee: Dr. Lynne Goldstein, Dr. Jodie O'Gorman, Dr. Joseph Hefner, Dr. Susan Sleeper-Smith, Dr. Gabriel Wrobel, and Robin Lillie. Each one you and your expertise shaped me and my research. Thank you to my chair, Dr. Goldstein. Your mentorship and guidance not only helped me but provided me a model on how to encourage and mentor my future students. And thank you for letting me do what I was interested in, both in terms of research and teaching. Thank you to Dr. O'Gorman who amazes me challenged me to think creatively. Thank you to Dr. Hefner who helped me learn statistical methods that I otherwise would not have discovered. Thank you to Dr. Sleeper-Smith who challenged me to think outside of archaeology and to read and interpret historical accounts and documents. Thank you to Dr. Wrobel who introduced me to new and interesting theoretical and methodological approaches that shaped this research. And thank you Robin. You have been a mentor to me throughout this entire process and I can't thank you enough for inspiring me. I honestly don't know what I would have done without you!

Thank you to the institutions, curators, and researchers who allowed me to use their data. Thank you to Laura Nolder and Robin Lillie at the University of Iowa, Office of the State Archaeologist for letting me comb through all your files. Thank you to Dr. Kristin Hedman and Eve Hargrave at the Illinois State Archaeological Survey for allowing me to use Hoxie Farm data, especially before it was published. Thank you to Dr. Michael Conner and Dr. Jodie O'Gorman for helping me with the Morton Village data. Thank you to Dr. Barbara O'Connell and Hamline University. Although I couldn't use this data, discussions with Dr. O'Connell early on in my pre-dissertation research challenged me to think about my research through a Native

view. Thank you to Dawn Scher Thomae at the Milwaukee Public Museum. Examining the Oneota records and materials during my pre-dissertation research helped shaped this dissertation. And thank you to Dr. Kate Blue, who had early discussions with me via email about how not everything is violence!

And thank you to the College of Social Science at Michigan State University for providing financial support for both my pre-dissertation research and my dissertation research. Thank you to my colleagues in the Division of Anatomy at Michigan State University for providing me encouragement and opportunity to vent. Finally, thanks to my fellow graduate students and peers, especially now Dr. Susan Kooiman, who let me talk things out so I could figure out what I was trying to say. Research and writing would have been a lot much more difficult without all of you.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

This dissertation seeks to examine fragmented and culturally modified human remains encountered at sites attributed to the Oneota archaeological culture (ca. AD 900 to 1700). In addition to primary burials, fragmented human remains – many of which are culturally modified – have been commonly encountered at Oneota sites. Oneota scholars have recently begun to examine culturally modified human remains, often offering conclusions either for or against violence and trophies of warfare (e.g. Henning 1970; Hollinger 2005, 2017; Blue 2006; 2015; Hedman 2015; Lillie and Schermer 2015a). However, none have systematically examined fragmented and culturally modified human remains or situated them in the larger Oneota mortuary program. Thus, this research will utilize a broad geographic and temporal range of Oneota sites, rather than a narrow focus on one site or one instance, to examine the variability of isolated and culturally modified human remains and determine the most likely explanation for their formation.

1.2 Research Goals

This research seeks to understand the complex processes that led to the fragmentation of human remains among the Oneota. Several research questions have been developed that will address fragmented and culturally modified human remains at Oneota sites, as well as the process of utilizing previously collected data. The research areas examined for this dissertation include (1) the difficulties in using previously collected data and recommendations for future data collection, (2) identifying patterning of isolated fragmented human remains and (3) for

culturally modified human remains, (4) identifying temporal and/or spatial patterns, and (5) evaluating violence as a possible interpretation.

Cultural modification of human remains will be examined using statistical, visual, and spatial analyses focused on identifying patterning in the presence and type of cultural modification. This research also presents an opportunity to examine whether violence is the most logical conclusion, or if these remains resulted from alternative processes or treatments. Finally, the data used for this dissertation will consist of previously recorded osteological, mortuary, and archaeological data. Therefore, this research will also evaluate if "old data" can be utilized to address new research questions and re-examine previous hypotheses. A discussion of the difficulties and inconsistencies in the osteological, mortuary, and archaeological data will be given. Recommendations will also be provided on how to approach isolated and fragmentary human remains both within the field and during analysis and data presentation.

1.3 Limitations of Research

As this dissertation examined only previously collected data from published resources, including site reports, articles, and volumes, a major limitation was amount of contextual information available for the human remains, especially for isolated elements. Although some human remains and resources, such as field notes, were available for research use, it was a choice by the author to utilize published archaeological, mortuary, and osteological data. This was primarily based on the large amount of data utilized for this dissertation, as well as to demonstrate the importance of researcher's publishing all available data, including contextual and non-primary burial data. Additionally, it was a goal of this research to identify pitfalls in

utilizing old data and offer possible suggestions or remedies for research and data collection regarding fragmented human remains.

Within the broad bioarchaeological literature, fragmentary and culturally modified human remains are often treated as atypical and problematic deposits (Tiesler 2007; Weiss-Krejci 2011). Early analyses in bioarchaeology and mortuary archaeology often focused on more complete, primary deposits, leading to variability in how data from isolated human remains are collected and recorded. Recently, to address these issues, researchers have developed specific methodologies, guidelines, and theoretical approaches for commingled human remains (Ubelaker 2002; Adams and Konigsberg 2004; Adams and Byrd 2008, 2014; Byrd and Adams 2003, 2009; Nikita and Lahr 2011; Osterholtz et al. 2014; Lambacher et al. 2016; Osterholtz 2016a), as well as for fragmented and disarticulated human remains (Chapman 2000; Fowler 2004; Knüsel and Outram 2004, 2006; Outram et al. 2005; Brück 2006; Mack et al. 2016). This includes literature that has been adapted, borrowed, and/or modified from faunal analytical models (e.g. Grayson 1984; Klein and Cruz-Uribe 1984; Dobney and Rielly 1988; Lyman 1994a; Marean et al. 2001; Reitz and Wing 2008), taphonomic approaches (e.g. Behrensmeyer et al. 1986; Haglund and Sorg 1997; Ubelaker 1997; Domínguez-Rodrigo et al. 2009; González et al. 2015; Braun et al. 2016), and forensic and bioarchaeological literature (e.g. Maples 1986; Sauer 1998; Smith 1997b; Sorg and Haglung 2002; Symes et al. 2002; Andrushko et al. 2005, 2010; Martín and Vargas 2007; Tiesler 2007; Loe 2008; Pérez et al. 2008; Tung 2008; Beary and Lyman 2012; Martin et al. 2013; Symes et al. 2014; Knüsel and Robb 2016).

Clearly, explanations are often more challenging for human remains that have been fragmented, modified, and isolated from their original context. Even with more recent developments in approaches to problematic deposits, several differing approaches in how

isolated human remains are analyzed, recorded, and discussed are still utilized by researchers. Generally, several major difficulties were noted: (1) variations in osteological data collection and recordation, (2) lack of archaeological and mortuary contextual data, (3) variations in approaches to fragmented human remains, and (4) variations in how mortuary data are published.

Due to the creation and wide-spread adoption of *Standards for Data Collection from Human Skeletal Remains* (*Standards*) by Jane E. Buikstra and Douglas Ubelaker (1994), osteological data collection has become relatively uniform for bioarchaeologists and osteologists, at least within the United States. Data used for this dissertation was primarily collected after the creation of these standards, leading to osteological data that should be comparable. However, additional difficulties cannot always be accounted for, such as unknown rates of inter- and intra-observer error both within and between samples and how data were recorded and curated (Geske 2014; Kendell 2016; Geske and Kendell 2017; Kendell and Geske 2017).

In addition to osteological data, archaeological and mortuary data are necessary to contextualize the human remains. Currently, no archaeological or mortuary standards exist in how to record contextual data for inhumations, including isolated human remains. As the sites used for this dissertation are in multiple states and excavated by different researchers, the methods used for excavation, data collection, and data recordation are also variable. Other factors, such as post-depositional disturbance, incomplete excavation, unrepresentative samples, and post-excavation loss also contribute to difficulties in data collection and recordation (Ubelaker 1981; Boddington 1987). This variability has led to a lack of contextual information for isolated human remains, especially in published resources, which has contributed to further difficulty in reconstructing the mortuary process and their meaning.

Standards created specific protocols and procedures for the collection of osteological data; however, its development was focused human remains from mostly complete, primary burial contexts. Additional difficulties in data collection are noted for secondary and tertiary (isolated and scattered) human remains. This has generally led to researchers to treat this data in a variety of ways, including listing the remains as unusual or problematical deposits, discussing fragmented remains only within the text of publications or site reports, attempting to reconstruct individuals, listing the data as appendices without discussion, or ignoring the data altogether. Each is an understandable approach based on the research aim and questions addressed. However, fragmented and culturally modified human remains are a meaningful part of the mortuary program and their inclusion within mortuary and bioarchaeological research gives a more holistic view of the mortuary program, even if their meaning is still currently unknown. Additionally, when utilizing data from multiple sites collected by researchers who have taken differing approaches, as this dissertation has attempted, the types of analyses become limited due to these vastly different approaches.

1.4 Significance of Research

This research will make multiple contributions to Midwestern archaeology, as well as to bioarchaeology and mortuary archaeology. First, there is a current trend to emphasize cases of violence, especially in Oneota studies. This research will evaluate such interpretations and will potentially provide alternative explanations that elucidate differences between violence, mortuary processes, and taphonomy. This will have impacts for fragmentary and culturally modified human remains found in other archaeological cultures that remain unexplained.

Second, this research will draw upon theoretical and methodological approaches

regarding the body and fragmentation to understand how past peoples may have viewed human remains. This study will contribute to an area of mortuary studies and bioarchaeology that currently remains under-theorized, especially in Midwest archaeology. More specifically it will provide real ways for future researchers to incorporate and interpret deposits that are difficult in nature, which will hopefully provide a deeper understanding of past culture and mortuary ritual.

Third, this dissertation will examine a portion of the mortuary record that has not yet been adequately addressed. Through the reconstruction of the mortuary process by incorporating and interpreting fragmentary remains, this research will give a larger and more holistic understanding of culture and ideology. The implications of this dissertation can be used to address additional issues of culture contact, violence, and identity within the Oneota.

Finally, it has been previously argued that fragmented and culturally modified human remains found at Oneota sites are attributable to violence (Hollinger 2005, 2017). It is argued that this explanation is common due to a focus on violent interaction that stems primarily from one site with one known violent event: Norris Farms 36 Cemetery. Many scholars have examined the violence found at this site (Milner and Smith 1990; Milner et al. 1991, 1992; Milner 1999; Milner and Ferrell 2011), and the skeletal trauma and violence recorded is undisputable. However, this one instance should not be used to (mis-)characterize an archaeological culture with the assumption that violence was wide-spread. Anthropologists have a responsibility to the cultures that they study. By emphasizing sensational explanations that do not include a consideration of the cultural and social processes as well as the variability within these processes, we are doing past cultures a disservice. Therefore, this dissertation research will stress the need to use several lines of evidence to critically evaluate multiple possible explanations.

1.5 Terminology

This dissertation will seek to identify and interpret meaning of fragmented and culturally modified human remains at sites attributed to the Oneota. To accomplish this, a set of definitions must be given prior to contextualizing any data. This necessitates a discussion of ritual. Although ritual is difficult to define, it consists of actions and practices, and not material culture (Barrett 1988; Hill 1995; Rowan 2011). Archaeological signatures suggesting ritual are also difficult to determine, as ritual can refer to religious and sacred acts, or even domestic acts associated with daily life (Rowan 2011; Thilderkvist 2013). Thus, this dissertation will use a broad definition of ritual, in that processes regarding the treatment of human remains are structured to follow a specific set of rules (Richards and Thomas 1984; Brück 1995).

Mortuary rituals are those that "construct passages between life and death" (Barrett 1988:31). Within mortuary rituals exist ancestor rituals and funerary rituals (Barrett 1988). Ancestor rituals establish the ancestors among the living, usually through funerary architecture and the ancestors' bones (Barrett 1988). Funerary rituals are those associated with burial (Barrett 1988). Weiss-Krejci (2011) also notes there are other processes that can happen in addition to or instead of normal funerary practices. She defines post-funerary processes as those that occur after the final deposition has taken place, while extra-funerary processes occur when the deceased do not undergo normal funerary treatment and instead receives an alternative form of treatment (Weiss-Krejci 2011).

Burials, also referred to as inhumations or interments, can be either primary or secondary and contain either one or multiple individuals (**Table 1**). Primary interments suggest that a body was placed into some type of grave relatively recently after death and has remained in its original interment location (Bello and Andrews 2006; Duday 2006; Martin et al. 2013; Boz and Hager

2014). Criteria for the identification of a primary burial rely on the completeness of the skeleton and the maintenance of most of the articulations (Bello and Andrews 2006; Duday 2006; Martin et al. 2013). Secondary burials do not display these characteristics, as the remains have been moved from their original interment to a secondary location (Bello and Andrews 2006; Duday 2006; Martin et al. 2013; Boz and Hager 2014). Examples of secondary burial include bundling, in which the individual is disarticulated, bundled, and reburied. Cremation may also be practiced, in which there is an intentional burning of the body resulting in a loss of skeletal elements (Bello and Andrews 2006; Martin et al. 2013).

Table 1: Definition of Terms

Terminology	Definition	Archaeological Signature
Primary interment	Body placed into one location and has remained in that original location	Skeleton mostly complete and articulated; may have some taphonomic or cultural disturbance
Secondary interment	Human remains have been moved from their original location to a secondary one (e.g. bundle burial); may also have multiple burials (e.g. ossuaries)	Some skeletal elements may be missing; disarticulated; may have some taphonomic or cultural disturbance; may be commingled
Cremation	Intentional burning of the body	Cremains
Tertiary remains	Loose, scattered, and disarticulated human remains	Disturbed; lack of burial context
Cultural modification	Body or skeletal elements undergo cultural processes (e.g. secondary interment, cremation, dismemberment, etc.)	Cultural taphonomic processes present (cutmarks, polishing, etc.); secondary burial; tertiary human remains
Trophies	Skeletal elements taken usually from captives or enemies, can also be culturally modified	Cultural taphonomic processes present (cutmarks, polishing, etc.); tertiary human remains

Adapted and expanded from Martin et al. (2013) and Boz and Hager (2014)

Following Boz and Hager (2014:19), human remains that are "loose, scattered, disarticulated" and "unrelated to burial contexts" will be designated as tertiary remains. Although it can be argued that these deposits are secondary in nature, this dissertation will use secondary deposits to refer to still relatively complete burials that have been bundle and/or moved to a secondary location. Tertiary deposits refer to human remains that are scattered, isolated, or disturbed and their meaning and/or depositional processes are unclear or unknown.

Although primary and secondary burials can become disturbed through multiple processes, tertiary remains only refer to remains that have no burial context and cannot be clearly associated with a nearby interment (Boz and Hager 2014).

Disturbance of burials can be caused by several different activities, including both human and non-human actions (Bello and Andrews 2006). Disturbance usually results in loss of skeletal elements, disarticulation, breakage, and scattering of the remains (Bello and Andrews 2006; Martin et al. 2013). Isolated bones usually lack any mortuary context; however, through the documentation of both cultural and non-cultural processes, they may aid in the understanding of the mortuary process (Martin et al. 2013). Cultural modification of human remains refers to when bodies, specifically skeletal material, are deliberately processed by humans, which can be caused by several different actions (Martin et al. 2013). This can include mortuary processing such as cremation, secondary interments, and bundle burials, as well as additional processes, such as carving, drilling, cutting, grinding, or other human-induced processes (Johnston 2015). This can be contrasted with another form of cultural modification, in which human remains are used as trophies, in that they were "acquired for use and retention as possessions or trade items" (Nawrocki and Emanovsky 2015:16).

As many of the human remains examined in this dissertation are found in refuse (trash) pit contexts, it is important to define and understand refuse, as well as the processes that affect archaeological sites and deposits. Primary refuse is discarded at the location where it was used, while secondary refuse was material that was deposited elsewhere from its location of use (Schiffer 1976). There is also de facto refuse, which is material that was left in place during an abandonment period (Schiffer 1976). Middens, although variably defined, can generally be regarded as a composite of multiple periods of refuse (Needham and Sørensen 1988). It should

be noted that none of these definitions imply negative connotations, although some researchers have used modern associations of trash to imply this.

1.6 Organization of Dissertation

Chapter Two provides an archaeological background and context for the Oneota. Chapter Three outlines the specific research questions and their context. Chapter Four presents the theoretical orientations that are used for this dissertation. It will outline the development of both bioarchaeological and mortuary archaeological theory to demonstrate the utility of a complimentary approach. It will specifically highlight a contextual approach utilizing theories regarding the body, partibility, and fragmentation (Brück 1995; Chapman 2000; Duncan and Schwarz 2014).

Chapter Five provides a discussion of the materials used for this dissertation. This includes description of the sites and osteological and mortuary data. Chapter Six outlines the methods for data collection and analysis, including a discussion of how taphonomic and contextual variables can be incorporated. The results are provided in Chapter Seven. Chapter Eight provides a discussion of these results and offers conclusions and proposes future research directions based on the results of this dissertation.

CHAPTER 2: ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

This chapter gives an overview of the Oneota archaeological culture in the Midwestern United States. It also includes the impetus for this research and a summary of recent literature regarding violence and the Oneota. Finally, a discussion of the cultural modification practices involving human remains among Native populations in the Midwest from the Archaic to Historic period is presented.

2.2 Overview of the Oneota

The Oneota are an archaeological culture characterized by their adaptation to a geographic and environmental region known as the Prairie Peninsula. This area was first described and used archaeologically by James Brown (1965) to refer to a region that contained a mix of grassland, forest, aquatic, and wetland resources (Berres 2001). The Oneota occupied this area of the Midwestern United States between approximately AD 900 and 1700, although these dates vary by region (**Figure 1**).

The Oneota are described as having a tribal level of social organization, in that they were relatively egalitarian groups with limited forms of social rank and differentiation (Schroeder 2004; O'Gorman and Lovis 2006). Archaeological indicators of Oneota sites include triangular projectile points, catlinite pipes, bell- or basin-shaped pits, and the presence of longhouses in some localities (Green 1995; Alex 2000; Benton 2001). Shell-tempered globular jars that display trailed or incised lines, chevron-like designs, and punctates are also characteristic for Oneota (Benton 2001). Based on similarities seen archaeologically, the Oneota are believed to be linked to Chiewere-Winnebago speaking Siouan groups, including the Ioway in northeastern Iowa, the

Winnebago (Ho-Chunk) in eastern Wisconsin, the Missouri, and the Oto (O'Gorman 1995; Tiffany 1998; Alex 2000).

Figure 1: Major Oneota Regions (modified from Henning 1998:346)

The Oneota lived in small, semi-permanent to permanent villages on well-drained terraces, along major rivers, or near lakes or swamps, often in resource areas referred to as ecotones, or transitional resource areas (Gallagher and Stevenson 1982; Overstreet 1997; Schroeder 2004; O'Gorman and Lovis 2006). Due to these specific settlement locations, the Oneota displayed a mix of subsistence strategies so they could take advantage of multiple resource areas (Gallagher and Stevenson 1982; Schroeder 2004; O'Gorman and Lovis 2006). This included the continued strategy of hunting and gathering, while also incorporating additional wetland resources and horticultural strategies using crops such as maize (Rodell 1997). Wetlands were especially important for subsistence as they are stable and able to

"regenerate themselves quickly after droughts and other extreme climatic fluctuations" (Goldstein and Richards 1991:204). Additionally, food procured from wetlands are available year-round and can be stored for later use (Goldstein and Richards 1991).

Although the origins of the Oneota archaeological culture have not been precisely determined, there are multiple theories for its development. The most accepted theory is that there was an in situ development of Late Woodland and/or Effigy Mound cultures in the Upper Mississippi Valley, possibly due to contact with Mississippian cultures (Tiffany 1998; Birmingham and Eisenberg 2000; Stoltman 2000; Theler and Boszhardt 2006). Theler and Boszhardt (2006) proposed that increased populations and constrained mobility of Effigy Mound cultures led to decreases in and overutilization of resources, leading to an abandonment of the region. Afterward Oneota populations, utilizing new resources and subsistence strategies, re-occupied the region. Stoltman (2000) argued that it was the adoption of corn agriculture in addition to contact with groups such as Middle Mississippians that led to the development of Oneota culture. In other regions, there were additional variations in the extent of interaction with other populations, such as Middle Mississippians, which led to the development of additional regional Oneota populations, including Silvernale phase in Minnesota and Fisher and Huber in Illinois.

As discussed by Overstreet (1997) and Tiffany (1988), other hypotheses for the development of the Oneota culture have also been argued. This includes a model that states the Oneota are the result of migrations and transformation of Middle Mississippian populations from the American Bottom and Cahokia region. A second model of Oneota origins is a transformation of local Late Woodland populations due to contact with Middle Mississippian groups. A final

model is that the Oneota tradition developed from a Late Woodland base independently of other cultures (Birmingham and Eisenberg 2000).

2.3 Oneota Taxonomy

The name Oneota originated from the Oneota River valley in Iowa, and specifically from a geological formation of Oneota dolomite found along the Upper Iowa River located in northeastern Iowa. This river was earlier known as the Oneota River (Hall 1995) and is located where the tradition was first discovered (Birmingham and Eisenberg 2000). The first use of the term Oneota was in an article by Ellison Orr in 1914 to type pottery (Slattery 1980), and it was later used in 1927 by Charles R. Keys to describe archaeological manifestations in northeastern Iowa (Alex 2000; Glenn 1974; Slattery 1980).

Midwestern and Oneota archaeology utilize terms from both the Midwestern Taxonomic Method (McKern 1939) and Willey and Phillips (1958) classification systems. The Midwestern Taxonomic Method was first employed to describe and classify the Oneota archaeological culture. Due to inconsistencies and vague definitions of this method, terminology was largely replaced by the Wiley and Phillips system. Although these methods were ultimately abandoned, remnants of both systems can still be seen today, such as the use of the terminology to describe archaeological cultures, such as the Oneota.

The Midwest Taxonomic Method organized archaeological traits using terminology that increased in specificity from base, pattern, phase, aspect, focus, and component. The terms such as component, focus, aspect, and phase were used to organize archaeological data, which was a way to organize artifacts and other material culture into trait lists (Lyman and O'Brien 2003:136). According to McKern's taxonomic system, a component was defined as "artifact

assemblages representing a single period of occupation at a site" (Trigger 2006:283). Similar components were grouped into a focus; similar foci were grouped into an aspect; similar aspects were grouped into phases; and similar phases were grouped into a pattern (Trigger 2006:283; Lyman and O'Brien 2003:136). Finally, similar patterns were grouped into bases, defined as cultures such as Mississippian or Woodland, which were each characterized by their own trait lists defined by settlement patterns and artifact types.

The Oneota were originally identified as an "aspect," in which similar broad patterns in traits were noted at archaeological sites found in both Iowa and Wisconsin. Dissimilarities were also noted between multiple Oneota sites across the Midwest, prompting McKern to create smaller "foci" (Glenn 1974:4). Other aspects, such as Fort Ancient in Ohio, were categorized with the Oneota Aspect as belonging to the Upper Mississippian Phase. This phase, along with the Middle Mississippian phase, was grouped into the Mississippian Pattern. It is generally agreed upon that the Oneota are a "subdivision of the Upper Mississippian cultural formation" (Brown and Asch 1990:145).

The problems with this classification became apparent as more Oneota sites were discovered. It was clear that the definitions between regional foci, the Oneota Aspect, and other Upper Mississippian cultures were ambiguous. It seemed that Oneota became a "catchall for archaeological complexes that occur in the general upper Mississippi-lower Missouri River region" (Wedel 1959:105). Due to these reasons, the "Oneota Aspect" was mostly discarded and replaced by "Oneota Tradition," following the Willey and Phillips (1958) classification system (Stevenson 1985:14). Additionally, the regional differences in the "Oneota Aspect" that were classified as "foci" under the Midwestern Taxonomic System were later replaced with the term

"phase" as defined by Willey and Phillips, referring to similarities in traits seen in archaeological culture (Stevenson 1985:14).

As the Midwestern Taxonomic Method did not organize archaeological criteria temporally, archaeologists later added the classification of "Horizons" (Emergent, Developmental, Classic, and Historic) to demonstrate change over time for the Oneota (Overstreet 1997). The term horizon in this application is not consistent with Willey and Phillips (1958), who define it as "primarily spatial continuity represented by cultural traits and assemblages whose nature and mode of occurrence permit the assumption of a broad and rapid spread," referring to differences seen over space (Willey and Phillips 1958:33) and instead refer to temporal differences. These changes in terminology have resulted in "literature that is, at best, confusing and, at worst, riddled with contradictions" (Stoltman 1983:229). Although these classification systems allowed for common archaeological patterning (traits) to be used to organize and classify information for comparison, ultimately the extensive focus on attributes, traits, and material culture and their inattention to the aspects of the human behavior that had shaped them led to their failure.

The beginnings of Oneota form during the Emergent horizon, dating to the early tenth century (Overstreet 1995). Emergent horizon Oneota exhibited traits that are intermediate between the Middle Mississippian and Upper Mississippian features, possibly a characteristic of a transition (Glenn 1974). It is distinguished by shell-tempered ceramics that are undecorated, lack shoulder decoration, and have lip modification (Overstreet 1995, 1997). Pinch pots were common, and lithics included small triangular points, as well as both stemmed and unstemmed knives (Overstreet 1995, 1997). Mortuary contexts for this time were variable and range from cemeteries to individual burial pits (Hall 1962).

During the Developmental horizon (approximately AD 1150 to 1350), mortuary practices, observed primarily at the Walker-Hooper site in Wisconsin, consisted of mound burials, although there is little evidence to suggest that mound burials were the rule and not the exception, as more recently excavated Developmental horizon sites have demonstrated cemetery and within structure burials (Overstreet 1995). Beginning in approximately AD 1350, larger changes occurred in Oneota culture, prompting a new classification called Classic horizon (Overstreet 1995). This phase encompasses what was traditionally thought of as the Oneota Aspect (Glenn 1974). Population size increased and coalesced into denser clusters (Overstreet 1997) as sites became larger and more concentrated (Overstreet 1995). Although Emergent and Developmental habitations were small, single-family structures, houses during the Classic Horizon were larger, exemplified by the longhouse. This change to longhouses has been attributed to shifts from a patrilineal or patrilocal postmarital residence pattern to a matrilineal or matrilocal pattern (Hollinger 1995). Burials were usually in cemeteries that were adjacent to multi-family dwellings, as well as below the floors of these houses (Overstreet 1997).

The last tradition of Oneota is the Historic horizon, which began around AD 1650 and lasted until European contact shortly afterward (Overstreet 1995). Overstreet (1995) argues that this period is characterized by smaller settlements that were probably inhabited seasonally. According to Henning (1998b), items such as gorgets and discs mad from local shell and often seen in burials appear to be found only in the Historic horizon. Historic horizon pottery was replaced by “brass, copper, and iron kettles” and when pottery is found it often reflects late Classic forms (Henning 1998b:356). Items from European sources, such as glass beads and copper bracelets show that the Oneota were a part of an Indian exchange system that was especially well-developed throughout the late Classic and Historic horizons (Henning 1998b).

2.4 Oneota as a Case Study

The Oneota represent an ideal case study for this dissertation. First, fragmented material has been recovered from multiple sites, but much of it has not been incorporated into studies of the larger mortuary programs. Mortuary practices among the Oneota range from extra-mural cemeteries located outside of the village to intra-mural burials, often located within house or mortuary structures (Kreisa 1993; O'Gorman 1995). However, scattered, isolated, fragmented, and culturally modified human remains have been found throughout the villages and within refuse pits, but have not yet been incorporated into the larger mortuary program of the Oneota. As these remains have been under-analyzed and not yet subjected to a regional or systematic approach, they provide an excellent opportunity to understand mortuary processes and mortuary variability within the Oneota.

Second, most Oneota skeletal and mortuary material has either been repatriated or reburied or is in the process of repatriation, making this an opportune time for study. For material that has already been repatriated, data collection will have been conducted relatively recently using Buikstra and Ubelaker's (1994) *Standards for Data Collection from Human Skeletal Remains*. This standardization was created to prevent the loss of osteological data, as well as allow for the combination and comparison of data. This research will demonstrate that data previously acquired and currently maintained in electronic and paper forms can still be useful for future research. This is especially important for osteological data, since burial and repatriation laws will only continue to limit access to Native human remains.

Third, multiple Oneota sites across the Midwest can be utilized, representing variation across time and space within one archaeological culture. Due to the large expanse and cultural variation of Oneota both regionally and temporally, sites from multiple horizons, phases, and

locations can be utilized. Therefore, sites used for this research are regionally and temporally diverse, allowing for additional regional levels of analysis, as well as intra- and inter-site comparisons.

2.5 Violence and the Oneota

Recent archaeological and bioarchaeological research on the Oneota has increasingly focused on conflict, violence, and warfare by quantifying trauma manifested on the skeletal remains found at some Oneota sites (e.g. Milner and Smith 1990; Milner et al. 1991, 1992; Milner 1999; Hollinger 2005, 2017; Milner and Ferrell 2011; Jeske 2014; Karsten 2015; Oemig and Karsten 2016). Our current understanding of Oneota violence is primarily based on studies of one Oneota cemetery site in Illinois, Norris Farms 36, which has undisputable evidence of violence. However, this one notable case has led researchers to generally characterize Oneota as violent and prone to warfare, even when no evidence of violence has been found at other sites. This trend has further led to an assumption that fragmented and culturally modified human remains found at Oneota sites are derived from violent behavior.

However, there are multiple problems with this interpretation, as stated by Blue (2006:7) in her interpretation of modified human remains in Minnesota: “The first problem is that there is no necessary relationship between skeletal modification and warfare; the second is that warfare, as defined by most anthropologists, does not exist outside of state-level societies, and third, the evidence for warfare and/or conflict is almost entirely lacking in Minnesota.” These same conclusions can be applied to other regions outside of Minnesota during the late pre-contact period, and for the Oneota in particular; however, the Central Illinois River Valley may be an exception.

According to Martin et al. (2014), researchers are much more likely to provide sensational explanations, such as cannibalism and violence, from disarticulated and isolated human remains. Such sensational conclusions are primarily based on the assumption that individuals who are valued within their society would not be treated or disposed of piecemeal. This kind of logic or assumption is present across multiple research areas, such as *The Taking and Displaying of Human Body Parts as Trophies by Amerindians*, edited by Chacon and Dye (2007), and multiple articles, conference proceedings, and dissertations (e.g. Pijoan and Lory 1997; Hollinger 2005, 2017; Schwitalla et al. 2014; Jeske 2014; Jenkins 2016), in which disarticulated and/or modified human bones are often associated with violence, trophies of warfare, or cannibalism. However, there are multiple problems with such an interpretation in studies of the Oneota:

1. No direct link has been established between fragmented or culturally modified human remains and violence.
2. Violence, and forms of violence, have been defined differently by various researchers.
3. Although bioarchaeological studies of violence have gained popularity, there are few theoretical explanations of violence.
4. Violence, as a sensational explanation, often garners more research and public attention and, thus, rates of violence in the past may be inflated.
5. Some researchers have ignored or not included cultural and social explanations of violence.
6. Other archaeological indicators of violence for the Oneota outside of the Central Illinois River Valley are limited or problematic.

Although there are a few examples of violence at sites across the Midwest, most notably Norris Farms 36 for the Oneota, most interpretations of violence have either stemmed from physical evidence, such as cutmarks visible on human bone, or archaeological evidence, including the presence of fortifications, weaponry, and warfare iconography (Dye 2009). However, many researchers have focused almost exclusively on skeletal evidence, hypothesizing that violence and warfare occurred based on the presence of cutmarks or postmortem modifications. This further assumes that these individuals represent enemies, while other explanations are not fully explored or considered. Alternatively, Duncan (2005) demonstrated how acts of veneration (e.g. ancestor worship, ritual) and violations (e.g. violence) can be expressed similarly in the archaeological record, and it is only through a careful examination of cultural and archaeological context that the difference can be determined.

Oneota researchers, such as Lillie and Schermer (2015a), argue that although these types of deposits have been interpreted as evidence for or the result of violence and warfare, other explanations have yet to be fully explored. For example, because many fragmented or culturally modified human remains that have been found in refuse pit contexts, they are often concluded to be the result of violence or cannibalism. However, treating the refuse pit context as negative conveys our ethnocentric views on trash, and may have "elevated the importance of human bone objects" (Smith 2015:285). Instead, it may be possible that materials, such as refuse and human remains, were deposited in refuse pits when the items' "'lives' had ended" or "were in a state of decay (and which we might thus classify as rubbish)" (Brück 1995:262). Additional alternative explanations for the fragmentation or modification of human remains include: as markers of group identity (Blue 2006, 2015); as a way to reproduce, negotiate, or strengthen social relationships with the living and/or the ancestors (Brück 1995; Chapman 2000; Chapman and

Gaydarska 2007); as a means of social communication or performance, or group identity (Osterholtz 2016b); or as a means of creating and controlling identities, serving as objects of veneration or trophies or warfare, or having magical significance (Tung 2014; Knüsel and Robb 2016).

Unfortunately, largely unsubstantiated interpretations of violence have still proliferated in Oneota studies and have led to possible mischaracterizations of the culture. Many researchers now refer to the Oneota as violent or prone to warfare in general, even if the evidence in other areas does not directly support this assumption. Again, this has primarily been based on clear and undisputed evidence of violence at Norris Farms 36, where the remains of 43 of 264 individuals displayed evidence of trauma and mutilation, including fractures, scalping, and dismemberment (Milner et al. 1991:583).

However, it has not been generally acknowledged that Norris Farms 36 may instead represent an outlier site or region, only displaying extreme violence due to the nature of the location of the site and the neighboring groups in the area, which may lead to very specific instances of violent interaction. Additionally, the prevalence of violence seen at Norris Farms 36 may be the result from other factors, such as preservation, which may inflate the actual levels of violence at the site. Assuming that violence is a characteristic of all Oneota culture leads to a narrow interpretation, when there may be additional, or more complex, processes at work. Therefore, these fragmented, scattered, and culturally modified human remains that are present at many Oneota sites offer an opportunity to examine the assumption of violence and present alternative interpretations for other possible processes.

2.6 The Cultural Modification of Human Remains in Context

Charles and Buikstra (2002) reconstructed the mortuary practices of groups from Archaic to Late Woodland in the Illinois River Valley to better understand the processes that formed the mortuary practices of later archaeological cultures. Following a similar approach, a review of research addressing the mortuary practices and cultural modification of human remains in the Midwest is presented. This approach allows for the examination of cultural modification through time and within multiple Midwestern archaeological cultures from the Archaic through Historic period. As this research focuses on the Oneota, patterning of modification of bone by previous archaeological cultures may inform interpretations of Oneota behavior. Framing any patterning in modifications of bone through time may elucidate any commonalities, or differences, in how modified remains are procured, manufactured, and discarded over time. Although this practice was widespread within and outside of this region, it would be an exhaustive review to cover every case; therefore, only general instances of cultural modification within archaeological cultures in the Midwest will be discussed.

2.6.1 Early Archaic

The onset of the Early Archaic period (ca. 8500 to 6000 BC) is characterized by an increase in global temperature along with greater seasonal variation, leading to decrease in the size and quantity of fauna (Morse et al. 1996). Additional changes in the landscape and climate occurred, increasing population growth and spurring developments in technology (Morse et al. 1996). Early Archaic band-level groups began to exploit a wider variety of resources with higher levels of mobility as compared to earlier Paleoindian populations (Anderson and Sassaman 2004). Due to this mobile, hunter-gatherer lifeway, Early Archaic mortuary sites most likely

consisted of burials near short-term settlement locations (Charles and Buikstra 1983; Milner et al. 2009).

2.6.2 Middle and Late Archaic

Although temperatures began to warm during the Middle Archaic period (ca. 6000 to 3000 BC), there were still seasonal temperature extremes, which may have led to population stress (Anderson and Sassaman 2004). These changes in the environment spurred the transition from residential to logistic mobility and a more sedentary lifestyle in the Middle Archaic (Brown and Vierra 1983). Compared to the Early Archaic, Middle Archaic sites are found almost exclusively on higher areas, such as terraces, as opposed to riverine environments (Lovis et al. 2005). Cultural changes included the addition of new tool forms and long-distance exchange, all of which require higher levels of cooperation, greater cultural complexity, and a decrease in mobility (Anderson and Sassaman 2004). Late Archaic groups (ca. 3000 to 1000 BC) continued with these trends, including increases in population size and the introduction of domesticated seed types (Lovis et al. 2005; Smith and Yarnell 2009).

Mounds and cemeteries appear in the Midcontinent during the late Middle Archaic and continue throughout the Terminal Archaic and into the later Woodland (Charles and Buikstra 1983; Milner et al. 2009). Mortuary practices, especially interment location, during this time were variable and included bluff-top burials, formal cemeteries, and midden burials within the habitation site (Charles and Buikstra 2002). The highly visible placement of bluff-top mounds is believed to reflect territorial claims to the land (Charles and Buikstra 1983; Charles and Buikstra 2002; Milner et al. 2009). The use of formal cemeteries was tied to decreases in mobility and the development of corporate group identity (Charles and Buikstra 1983), while interment in midden

burials were reserved for specific portions of the population, including the very young, very old, and the disabled (Charles and Buikstra 2002). Finally, an additional location of disposal of floodplain burials also appears during the Middle Archaic, which may have been used only during seasonal gatherings when populations were more mobile (Charles and Buikstra 2002).

During this time, most burials were primary flexed or semi-flexed burials, with occasional secondary burials also represented (Smith 1997b; Milner 1999). Beginning in the late Middle Archaic, there is archaeological evidence for culturally modified human remains, specifically crania (Speal 2006a). Many of these culturally modified crania are found in shell middens along riverbanks in the eastern mid-continent (Speal 2006a). "The 'skull bowls' typically consist of only the calvarium, circularly cut just above and behind the ear, the edges of which are beveled, rounded and smoothed" (Speal 2006a:119). These objects often contain two perforations, suggesting that they may have functioned as gorgets or display (Speal 2006a). There is also evidence of drilling of human teeth and modification of human post-cranial remains for tools (Webb and Haag 1947; Speal 2006a). Archaeological evidence of violence during this period, especially in the Tennessee Valley, consists of projectile trauma and scalping (Smith 1997b). There is also evidence of "headless burials and burials with extra crania," which have been part of a mortuary ritual or linked to peri-mortem violence (Speal 2006a:119; Webb and Dejarnette 1942).

2.6.3 Early Woodland

The Early Woodland period (1000 to 300 BC) has some continuity with the previous Late Archaic period, in that groups were egalitarian and organized into small, hunter-gatherer groups (Anderson and Mainfort 2002). However, in contrast to previous Archaic populations, there is

the appearance of ceramic pots attributed to changes in subsistence, including increases in plant cultivation of both domesticated and wild native cultigens (Stevenson et al. 1997; Milner 2004; O'Gorman and Lovis 2006). The dead were again buried in midden areas in the Midwest, like in Early Archaic times (Charles and Buikstra 2002). However, as mobility increased during the Early Woodland period, burial mound construction began (Milner 2004) and large communal earthworks appeared in portions of the Midwest (Charles and Buikstra 2002) and the Southeast (Anderson and Mainfort 2002). It is believed that these Early Woodland groups would have seasonally aggregated to these structures (O'Gorman and Lovis 2006) making these structures markers of territory, as well as ways in which kin groups could demonstrate and enhance prestige and renew and reaffirm group ties (Milner 2004).

The most well-known local variant of the Early Woodland period is Adena, located in the Middle Ohio Valley (Milner 2004, Applegate 2005). Although many Early Woodland groups had limited contact with nonlocal groups, Adena culture represents a larger sphere of interactions based on exotic and nonlocal goods, such as copper and mica, found in burial mounds (Anderson and Mainfort 2002; Milner 2004).

The modification of human crania was also present in the Early Woodland Adena populations (Fenton 1991; Speal 2006a). Similar to the Archaic crania, the Adena crania had drill holes, possibly indicating their use as gorgets; however, they also show evidence of paint with red ochre and graphite (Speal 2006a). Also, like earlier Archaic traditions, "strings of drilled human teeth" have been recovered from Adena sites (Speal 2006a:120).

2.6.4 Middle Woodland and Hopewell

The Middle Woodland period (ca 300 BC to AD 500) is characterized by developments in agriculture and horticulture, sedentism, and population size, in comparison to the previous Early Woodland period (Seeman 1995). Regional patterns of previous Early Woodland subsistence and settlement also continued, such as in west central Illinois where Middle Woodland populations began to cultivate seeds, but also continued to rely on fishing and other floodplain resources (Asch et al. 1979).

The repopulation of areas that were abandoned by previous Early Woodland groups, especially in the Illinois River Valley, led to the development of increasingly more elaborate funerary rituals (Charles and Buikstra 2002). The mortuary activities that existed in Archaic times continued into the Middle Woodland period, including floodplain gathering sites and bluff-top mounds, some of which were built directly on previous Archaic burial sites (Charles and Buikstra 2002). However, unlike previous groups, the Middle Woodland floodplain mounds, characteristic of the Hopewell, were not burial monuments, but were areas of active group participation that allowed for renewal of relationships and ties to landscape, as well as references to ancestors (Charles and Buikstra 2002).

The most well understood aspect within the Middle Woodland period is the Hopewell. The Hopewell were relatively sedentary, with a resource base that was dependent on a mix of horticulture and hunting and gathering, often living in diverse environments with seasonal movement (Abrams 2009). The Hopewell were organized into small, local communities, each associated with their own earthworks and multiple communities contributing to larger earthwork complexes (Abrams 2009). The locations of these earthworks were based on a variety of factors, such as soil conditions, topography, and other environmental factors, and may have

functioned to represent cosmologies or make political or social statements (Greber 2006). The presence of exotic materials and similarities in material culture over many Middle Woodland Hopewell sites, as well as the presence of large constructed earthworks that would have required a large amount of group labor, demonstrates a long-termed, widespread, and shared ideology; together these traits are referred to as the Hopewell Interaction Sphere (Greber 2006; Abrams 2009; Schermer et al. 2015).

Although Middle Woodland Hopewell modified human remains are present throughout the Midwest, most have been found in Ohio (Nawrocki and Emanovsky 2015). At Ohio sites, the most frequently modified skeletal element is the cranium, followed by the mandible, while in the central Illinois River valley, the mandible is the most frequently modified element and displays a greater variation in style (Cobb 2015). Multiple modified human remains have been recovered from Middle Woodland sites in the Central Illinois River Valley (Cobb 2015). These have most often been mandibles recovered in mortuary contexts, which parallels animal jaws that have also occurred in the same contexts (Cobb 2015). Cobb (2015) argues that the modified remains indicate links to ancestors, as well as indicating status. Many of the modified mandibles contain perforations; however, these perforations do not show evidence of polishing, suggesting that if they were suspended that they were used infrequently (Cobb 2015; Johnston 2015).

The Middle Woodland Hopewell also demonstrate the most extensive evidence of culturally modified human bone, including disassociated skulls; ornamental teeth and facial bones; clay and pigment decoration on skulls; rattles, circular disks, and ceremonial masks made from portions of human skulls, as well as a few tubular artifacts and whistles made from human long bones (Speal 2006a; Smith 2015). Skulls and mandibles were drilled, incised, ground, perforated, and polished (Johnston 2015; Nawrocki and Emanovsky 2015; Schermer and Lillie

2015). Schermer and Lillie (2015) discuss rondelles, or circular bone disks cut from the cranium, that have been found in Middle Woodland mortuary contexts in Iowa, suggesting that these objects had a "strong link to death and rebirth" (Schermer and Lillie 2015:123).

Generally, there have been four main interpretations of the modification of human remains among the Hopewell: "trophy taking, ancestor veneration, memento mori, and ritual objects" (Smith 2015:276). Culturally modified human remains, and specifically those dating to the Hopewell, have typically been interpreted as trophies of warfare (e.g. Seeman 1988). However, based on the scant evidence of perimortem trauma, violence or warfare seems an unlikely explanation (Nawrocki and Emanovsky 2015; Smith 2015). Instead, multiple scholars have aruged that the cultural modification of Hopewell human remains is more likely attributable to ancestor worship (Johnston 2015) or other forms of funerary ritual, due to strong themes of shamanism and renewal during this period (Carr and Novotny 2015; Smith 2015). It appears that, "regardless of the function of culturally modified human remains in Hopewellian mortuary behavior, either sex could participate as donors of raw material or as posthumous recipients of culturally modified human remains as long as biological maturity had been reached" (Johnston 2015:78). And it is generally agreed that the objects themselves would have carried more meaning than the person they originated from, whether that be war captive, trophy, disturbed burial, relative, or ancestor (Speal 2006a; Smith 2015).

2.6.5 Late Woodland

The transition from Middle Woodland to Late Woodland has sometimes been described as a collapse or cultural decline due to comparisons between the previous elaborate Hopewell culture and apparent decreases in status differentiation, mound building, and exchange of exotic

goods during the Late Woodland. However, more recent work (Green and Nolan 2000; McElrath et al. 2000) recognizes that these changes may reflect an aggregation of groups across the landscape. Elaborate goods are not common, and the perspective seems to have shifted from external factors to internal ones. The Late Woodland began around AD 700 and lasted until roughly AD 1000 in the Midcontinent with the development of Mississippian societies and until circa AD 1700 in the Great Lakes (Schroeder 2004). During the Late Woodland period there were multiple technological and cultural developments, most notably the bow and arrow, which further developed lithic technologies and would have allowed for more efficient hunting of smaller game at a closer range (Shott 1993; Speal 2006a). Late Woodland groups most likely developed through multiple, regional transitions (McElrath et al. 2000), which may account for the number of documented regional differences.

Rises in population and horticulture during the Late Woodland and declines in trade and competition resulted in a simplification of the previous Middle Woodland mortuary rituals (Charles and Buikstra 2002). This is seen as a decrease in mound building and a return to bluff-top accretional cemeteries involving less elaborate ritual and fewer grave goods (Charles and Buikstra 2002).

Within the Midwest, culturally modified human remains are most commonly found among Late Woodland populations around the Great Lakes (Speal 2006a). The Late Woodland Younge mortuary complex located in the central Great Lakes area is characterized by postmortem skeletal modifications, most often in the form of drilled perforations on the cranium and long bones, removed disks of bone from the cranium, and clay coatings on the exterior of skulls (Speal 2006a). While early to middle Late Woodland mortuary practices typically consisted of primary interments that were flexed or extended, in the late Late Woodland

secondary burials become more common (Speal 2006a). Thus, cutmarks on the human remains during this time are most often the result of dismemberment and defleshing (Speal 2006a). Speal (2006a) argued that the disk removal of the cranium may be related to this practice as a way to remove the brain for defleshing and cleaning the skull. When examining trauma on skeletal remains from Younge mortuary complex sites, females tend to display higher frequencies, as well as antemortem incisor ablation. Although a narrow interpretation, Speal (2006a) suggested that these females were possibly captives or that the modifications were used as a means to advance the power of those who caused them.

2.6.6 Early and Middle Mississippian

The transition from the Late Woodland to the Early Mississippian period was characterized by several organizational changes, such as the emergence of chiefdoms and hierarchical sociopolitical organization, revitalization of mound construction, increased sedentism, higher population density, and a localized mode of production (Muller and Stephens 1991). During the Middle Mississippian (ca. AD 900 to 1700) an extensive trade network developed that allowed for the exchange of objects and materials, including elite goods (Emerson et al. 2003). This is evidenced by the Cahokian-style artifacts found at sites across the American Bottom region that were likely manufactured at Cahokia (Emerson et al. 2003). Although this has been argued as a demonstration of the influence of Cahokia during this time (Emerson et al. 2003), Milner (1991) aruged that the influence of Cahokia over the periphery has been over-exaggerated. Instead, it is likely that the levels of interaction and influence from Cahokia were variable (Stoltman 1991), as some populations adopted these new cultural ideas, styles, and

religion, while other Late Woodland populations chose to continue some aspects of their previous traditional uses of land, resources, and cultural styles (Bardolph 2014).

Culturally modified human remains during the Early and Middle Mississippian were much less common than during the Woodland period (Schermer et al. 2015; Smith 2015). Archaeological evidence for intergroup violence increases during this period; for this reason, the most common interpretation of culturally modified and additional human remains burial inclusions is trophy taking (Smith 2015). Isolated and culturally modified human remains have been recovered from Submound 51 at Cahokia (Hargrave and Cook 2015). Cutmarks reflecting postmortem processing, as well as taphonomic modifications are also present on these remains, suggesting that they had once been exposed to the elements prior to their deposition (Hargrave and Cook 2015). Two additional human long bones display modifications that suggest they were used as tools (Hargrave and Cook 2015). Additional modified human remains have also been recovered from other Mississippians sites, such as from the Angel site in Indiana, in which cranial remains may have been a part of a rattle (Collins and Munson 2015). While modified human bones from Caborn-Wellborn phase sites in Indiana and Kentucky has generally been interpreted as trophies (Munson et al. 2015).

Human remains recovered from the site of Aztalan in Wisconsin have been found in multiple contexts, including primary burials and scattered human remains (Goldstein 2010). Early interpretations considered these to be the result of cannibalism; however, re-examinations of this data by Goldstein (2010) have shown that it is more likely that these different methods of disposal were stages in a mortuary process and that additional human remains from interments is found during the Mississippian period.

2.6.7 Upper Mississippian – Oneota

Upper Mississippian societies were relatively contemporaneous with Middle Mississippian societies, although Middle Mississippian societies are considered to be a distinct cultural group with more dispersed settlements (Schermer et al. 2015). Developing roughly around AD 1000 and lasting into the Historic period (ca. 1700), Upper Mississippian encompasses multiple archaeological cultures across the Midcontinent, including Fort Ancient groups in southeastern Indiana and southern Ohio, as well as eastern Kentucky and western Tennessee. Oneota groups were found in "concentrated localities discontinuously distributed" in Illinois, Iowa, Wisconsin, Minnesota, Missouri, and smaller portions of neighboring states (O'Gorman 2010:578; Schroeder 2004). Sites of this period show archaeological evidence of "extraregional trade, population movement, and the threat of violence" (Schermer et al. 2015:10). Multiple types of culturally modified human bone have been found at Oneota sites, including "polished and incised human bone fragments; cranial and dental elements perforated or grooved for suspension; calvaria used as vessels or bowls; gorgets, masks, and rattles constructed from cranial bone; and, less commonly, the modification of human long bones for use as beads, tubes, awls, raps, handles, and pipestems" (Hedman 2015:193). Hedman (2015) examined culturally modified human remains from Oneota sites in Illinois, identifying two main types of bone modification: marks related to disarticulation and defleshing, and marks related to shaping the bone into a ritual or utilitarian object. Multiple designs are found on these human remains, but the most common are geometric patterns and human, animal, or mythical figures (Hedman 2015).

Blue (2006, 2015) examined the cultural modification of human teeth among the Silvernale phase Oneota in the Red Wing locality of Minnesota and Wisconsin, in which the

roots of teeth are notched. The teeth may be utilized for multiple reasons, especially as they are easily procured and removed (Blue 2015). Teeth can serve as a form of ornamentation or displays or may be filled with the owner's essence. Many of the notched teeth followed similar patterns (anterior, maxillary, right side) and are believed to be objects of personal adornment (Blue 2015). Thus, Blue (2015) argued that the grooved teeth follow a larger pattern of postmortem processing in the area: fragmentation of the body and a loss of individual identity, with the grooved teeth serving as symbols of group identity.

Lillie and Schermer (2015a) examined culturally modified human remains from multiple sites in Iowa and argued for explanations other than violence. An intact human cranium with multiple incised designs demonstrates that the smaller incised fragments that are often found at Oneota sites may have resulted from one larger original piece of bone and the polishing seen on many of these remains are reflective of handling or ritual use, which ended in their discard (Lillie and Schermer 2015a). Lillie and Schermer (2015a) also noted the inherent bias in assuming that their discard was in a trash pit, since these locations may have served another purpose.

2.6.8 Contact and Historic Periods

The Feast of the Dead, practiced by both Iroquoian and Algonquian groups, is an example of cultural processing of human bone that is found during the Historic period. In this ceremony, groups of people gathered at ceremonial locations to exchange cultural material and ideas and feast, as well as rebury their dead in mass secondary interments (Speal 2006a). This ceremony allowed for the creation and maintenance of social relationships among groups that were culturally and geographically dispersed (Speal 2006a).

Cultural modification of human remains, especially in the form of trophy-taking of scalps and other body parts, has been associated with many Iroquoian groups (Williamson 2007). This generally has been framed as a result of reciprocal violence and warfare to avenge a death, with the practice more common prior to the arrival of Europeans to the area (Williamson 2007). More recent evaluations (Jenkins 2016) have examined scattered and modified human remains found at Iroquoian sites. Forms of intentional modification include drilling, incising, and polishing and their widespread distribution at multiple sites suggests that it was a shared practice (Jenkins 2016).

The modified human remains during the protohistoric period and among the Iroquois have typically been interpreted as the result of violence (e.g. Williamson 2007; Jenkins 2016), often corroborated by documented historical accounts of enslavement and warfare that was waged by these groups and others (Rushforth 2012). During this time spatial mobility and cultural identities are challenged, especially due to displacements caused in part by the arrival and movement of Europeans (Parmenter 2010). These tensions created the middle ground as described by White (1991) in which accommodation occurred between the Natives and Europeans, or as a native ground as described by DuVal (2006) in which the Natives maintained their power. In the *pays d'en haut*, located mostly in the present-day Great Lakes region, Witgen (2012) has instead argued that that the relationships formed within this area constitute a Native New World that allowed the Natives to maintain their autonomy while the Europeans maintained their belief of having domination and control.

2.7 Summary

This chapter provided an overview of the Oneota Tradition and a short history of how human remains have been culturally modified through time. Further discussion of the sites used for this dissertation can be found in Chapter Five. Culturally modified human remains have been encountered throughout prehistory in the Midwest and eastern mid-continent. During the Archaic, the practice of human skull modification appears and continues into the Protohistoric period. During both the Hopewell and Middle Mississippian periods cultural modification of human remains are present. Although cultural modification does begin to disappear with the appearance of Europeans, protohistoric and historic accounts of Iroquoian groups do demonstrate aspects of similar ideologies, such as that seen in the Feast of the Dead.

Although fragmented and culturally modified human remains have been encountered at multiple Oneota sites, their interpretations have been limited. That said, interpretations of violence in the past have recently increased and some of these interpretations are based on limited evidence. These previous studies have provided the impetus for this research, in which fragmented and culturally modified human remains, in addition to violence, will be examined.

CHAPTER 3: RESEARCH QUESTIONS

3.1 Introduction

This research seeks to examine tertiary and culturally modified human remains commonly found at Oneota sites. Using archaeological, mortuary, osteological, and ethnographic data, previously explanations will be re-evaluated and possible meaning(s) provided. As this dissertation uses previously collected data, there will be a discussion about the benefits and difficulties of such. Finally, based on the results, recommendations will be given for data collection regarding tertiary and culturally modified human remains.

3.2 Context for Research

Protocols for recording osteological data were developed primarily in response to the Native American Graves and Repatriation Act (NAGPRA), in which large amounts of Native skeletal collections were in process of repatriation and return. In the United States, the most commonly used guidelines are *Standards for Data Collection from Human Skeletal Remains* (*Standards*) by Jane E. Buikstra and Douglas Ubelaker (1994). *Standards* was created not only to provide researchers with a way of collecting large amounts of data in a short amount of time, but also to standardize these data for future research. *Standards* is still the primary method for data collection in the United States, although additional methods, especially from forensic anthropology, have been developed or amended since.

Standards' collection procedures and recording forms were mainly developed from the perspective of primary burials. Thus, a major shortcoming of this system is that when secondary burials and tertiary (fragmented, scattered, isolated) bones are encountered, there is no

standardized way to record information. While most skeletal data can be collected and recorded, the archaeological context of the element is much more difficult. This includes difficulty in recording the type of feature, such as differences between cache, storage, and trash pit. As discussed, these terms, sometimes used interchangeably, can place unintended assumptions on the materials found within them.

Due to these difficulties, researchers have dealt with secondary and tertiary remains in several ways. Some have classified the remains outside of normal primary burials and provided them as lists of unusual or problematical deposits. Others have mentioned them in the text, but do not provide data regarding them; others reconstruct individuals, often utilizing techniques for commingled deposits. And finally, some have ignored them completely, either intentionally or unintentionally. Each is understandable in the context of the research questions addressed; however, these approaches limit the ability to reconstruct mortuary or taphonomic processes that led to the distribution and fragmentation of human remains.

This dissertation seeks to examine these types of remains to examine an aspect of the Oneota mortuary program that is still poorly understood. However, to perform this type of analysis it must also be acknowledged that this research follows a similar pattern. Specifically, it concentrates on a sub-section of the mortuary program and may intentionally or unintentionally ignore other aspects. This research will focus on human remains that have been culturally modified, either as the fragmentation of human remains or processes such as dismemberment, cutting, incising, burning, and polishing due to use-wear.

3.3 Research Questions

In order to understand the complex processes that led to the fragmentation, scattering, commingling, and/or modification of human remains across multiple Oneota sites, research questions will be multifold:

Research Question 1: Can previously collected data be used for modern osteological research and can these data be used to identify patterning in the treatment of human remains by Oneota people?

Research Question 2: Tertiary, fragmented, and isolated human remains are commonly encountered in Oneota village sites. Fragmentation theory suggests that the body is divisible and partible and parts of which can contain meaning. Using fragmentation theory to examine the osteological, mortuary, and archaeological data can patterning be determined?

Research Question 3: Culturally modified bone can result from multiple processes. Through the examination of osteological, mortuary, and archaeological data, can patterning of culturally modified skeletal remains be determined? If patterning is present, can possible explanations for this patterning be identified using ethnographic sources and theories regarding the body?

Research Question 4: Oneota sites used for this research span a large geographic and temporal region and represent different phases and foci. Will patterning for the fragmented and/or culturally modified human remains vary at specific temporal, spatial, and/or regional scales?

Research Question 5: Research in the Central Illinois River Valley has focused on levels of interaction and violence with neighboring groups (primarily based on one site), but does the level of violence found for the Oneota in the Central Illinois River Valley differ in magnitude or kind with Oneota populations outside this region?

3.3.1 Research Question 1: Can previously collected data be used for modern osteological research and can these data be used to identify patterning in the treatment of human remains by Oneota people?

The data used for this research was previously collected and came from published resources. This includes archaeological, mortuary, and osteological data, the majority of which was recorded prior to repatriation and/or reburial of the artifacts and human remains. Repatriation is now common following state and federal repatriation laws, including the Native American Graves Protection and Repatriation Act (NAGPRA). Although these laws have created

more communication between archaeology and Native populations, they also pose a number of potential issues for researchers utilizing Native American material, including osteological data. Standards have been created for the collection of osteological data (e.g. *Standards* by Buikstra and Ubelaker 1994), and the majority of the data utilized for this dissertation was analyzed or re-analyzed after the creation of these standards. However, currently no standards exist for the collection and recordation of mortuary and archaeological data, especially for contexts regarding tertiary human remains. Therefore, this research question will examine the opportunities and barriers and problems associated with these policies and how they affect research into the past.

As *Standards* was developed primarily for osteological data collection on primary interments, researchers have approached, recorded, and discussed non-primarily burials in several differing ways. This has led to inconsistencies in data and has led to potential problems when utilizing multiple data sets. Specifically, this will focus on human remains that have been fragmented and culturally modified. This research question will serve to highlight these inconsistencies, point out the potential pitfalls of using "old data", and provide suggestions of how researchers can treat non-primary, fragmented human remains in the future to allow for improved standardization.

3.3.2 Research Question 2: Tertiary, fragmented, and isolated human remains are commonly encountered in Oneota village sites. Fragmentation theory suggests that the body is divisible and partible and parts of which can contain meaning. Using fragmentation theory to examine the osteological, mortuary, and archaeological data can patterning be determined?

Within Oneota sites, human remains are often encountered as fragmentary (tertiary), isolated, and scattered within multiple non-burial contexts. Human remains can become

fragmented, scattered, and culturally modified for multiple reasons, including violence, veneration, taphonomy, accident, or as a by-product of mortuary processing, among many others.

This research question seeks to identify patterning in the tertiary remains found within Oneota village sites. Due to limitations in spatial and contextual data regarding tertiary remains, this research will use skeleton heat-maps to demonstrate the frequency that elements are found within each Oneota site included in the sample. This method will allow for any patterning in the osteology to be identified and evaluated, although the context for their recovery is limited due to inconsistent data recording from site records. Once patterning is identified, the frequency of elements can be evaluated for possible meaning(s) using ethnographic resources and fragmentation theory, as developed by Chapman (2000). Fragmentation theory describes the deliberate fragmentation and exchange of objects, including human remains, creates relationships between the living and the dead. This process, known as enchaninment, occurs as the object is created and modified, fragmented, and passed along. The object can then be further broken and exchanged "until the reconstitution of the relationship is required" and then the objects are disposed (Chapman 2000:39). This same process can occur with human remains, although the bonds created through the passing of the human bone fragments in this case symbolize kinship links through the mobilization of ancestral ties, connecting ancestral material to their kin. Therefore, the fragmentation and enchainment of objects and human remains demonstrates that "objects transmit not only the symbolism of their complete, once-intact form but also the enchained, or fractal, connotations of the past markers and owners" (Chapman 2000:39).

3.3.3 Research Question 3: Culturally modified bone can result from multiple processes. Through the examination of osteological, mortuary, and archaeological data, can patterning of culturally modified skeletal remains be determined? If patterning is present, can possible explanations for this patterning be identified using ethnographic sources and theories regarding the body?

Oneota researchers have outlined several interment patterns for the Oneota, including within structure burial and cemetery interments (Kreisa 1993; O'Gorman 1995). Culturally modified human remains have also been encountered at Oneota sites. Recent research has begun to examine these remains (Hollinger 2005, 2017; Hedman 2015; Lillie and Schermer 2015a); however, a systematic examination of these remains has not yet been conducted. Additionally, previous studies have tended to focus on a few sites or a limited region. This dissertation sought to examine a wide range of Oneota sites across the Midwest in order to examine the variability in this practice.

Archaeological context will be compared to osteological data, such as age, sex, context, or other variables, to identify patterns in distribution and frequency. Generally, there have been four major interpretations of cultural modification of human remains, including "trophy taking, ancestor veneration, memento mori, and ritual objects" (Smith 2015:276). The trophy taking hypothesis assumes that the cultural modification would focus on young males, as they would be more likely to engage in conflict (Johnston 2015), although research has demonstrated that this is not necessarily always the case (Bengston and O'Gorman 2017a,b). The ancestor veneration hypothesis would choose individuals of either sex for modification, although most likely adults (Johnston 2015). The memento mori hypothesis is based on individuals keeping parts of someone for remembrance (Johnston 2015). Finally, for the ritual object hypothesis it would not necessarily matter who the remains were from, but just that they were human (Johnston 2015) or they may have needed to be from a relative or powerful person in order to hold meaning.

However, these are all difficult to distinguish archaeologically, and not every culturally modified bone necessarily was made for the same purpose. Additionally, multiple types of modifications may be present at any one site or within any one culture and the reasons for the modification may stem beyond any of these hypotheses (Johnston 2015). In fact, based on the differences in the ways these objects have been made and deposited by multiple cultures suggests that there were many variations in significance (Johnston 2015). Therefore, theoretical approaches regarding the body and fragmentation of human remains (Chapman 2000), as well as a contextual approach (Brück 1995) will be utilized to evaluate these possible interpretations. N

Statistical analysis will utilize correspondence analysis to evaluate any associations between sites, or groups of sites, and the type(s) of cultural modification present. In order to interpret the results, a biocultural theoretical framework that incorporates ideas of the body, personhood, and partibility will be utilized (Chapman 2000), in addition to a contextual methodological approach (Brück 1995). Specifically, theories that address the body and its partibility will be utilized to interpret how an individual can be fractured into many parts, each of which can maintain that person's identity or create or maintain a relationship through exchange. And a contextual approach will aid in the understanding how the possible meaning of the location of these remains within the site.

3.3.4 Research Question 4: Oneota sites used for this research span a large geographic region and represent different phases and foci. Will patterning for the fragmented and/or culturally modified human remains vary at specific temporal, spatial, and/or regional scales?

As regional differences among the Oneota may be more reflective of large changes in culture through time, this research uses a wide-ranging spatial area and multiple phases of Oneota to address possible variations in Oneota culture. Through both intra- and inter-site

comparisons, sites will be compared statistically using Kruskal-Wallis tests that will allow sites to be grouped based on similarities in presence and type of cultural modification.

In addition to an examination of the context in which these remains are found, spatial analysis will be conducted in order to visually identify these isolated and culturally modified remains in relation to other site features. General mortuary patterns within and between sites will also be examined using spatial analysis. Finally, sites will be classified by their assigned phase and horizon and compared to identify if there are any associations between culturally modified human remains along temporal lines.

3.3.5 Research Question 5: Research in the Central Illinois River Valley has focused on levels of interaction and violence with neighboring groups (primarily based on one site), but does the level of violence found for the Oneota in the Central Illinois River Valley differ in magnitude or kind with Oneota populations outside this region?

One explanation for the presence of fragmented and culturally modified human remains within the Oneota has been violence. This interpretation is common in the current bioarchaeological and archaeological literature on the Oneota, in which researchers tend to focus one specific case of violent interaction in the Central Illinois River Valley at Norris Farms 36 Cemetery event in which 43 individuals (~16%) sustained traumatic injury (e.g. Milner and Smith 1990; Milner et al. 1991, 1992; Milner 1999; Milner and Ferrell 2011; Bengston and O'Gorman 2017a,b). Additional skeletal evidence violence has also been found the nearby site of Orendorf, a Middle Mississippian village site occupied around the same time (Steadman 2008), as well as generally in the Central Illinois River Valley (Emerson 2007; Milner 2007).

However, levels of violence for the Oneota, as well as the fragmented and culturally modified human remains found within sites attributed to this culture, have not been systematically studied. This research question will address if instances of violence and trauma,

typically scalping and perimortem trauma, are associated with other instances of cultural modification, such as tertiary remains, burning, incising, and other cutmarks. The sample used for this dissertation includes Norris Farms 36, as well as instances of scalping and perimortem trauma from other sites, to examine if violence is an explanation or if other explanations are equally valid.

3.4 Summary

This research will focus on the human remains from primary and secondary burials, as well as fragmented bones from tertiary contexts, recovered from six Oneota archaeological sites across the Midwest. The focus of this dissertation is to examine a portion of these data in more detail by concentrating the analyses on tertiary remains, especially those that have additional cultural modifications. As not every bone that has been culturally modified will have some type of mark, this research includes context for the remains, such as primary, secondary, tertiary, multiple, or post-interment addition.

Analysis of the data will occur at several levels. Sites selected for this dissertation were selected if they contained primary and non-primary human remains, as well as more detailed associated contextual data (see Chapter Five). There are many more Oneota sites that contain evidence of fragmented and culturally modified human remains; however, for many have incomplete data. This includes sites with early excavations that did not record contextual data, limited site excavations, and the paucity of human remains. Examples of cultural modification were added to later analyses to increase sample size and to test conclusions drawn from the primary sites.

CHAPTER 4: THEORETICAL FRAMEWORK

4.1 Introduction

In order to make successful inferences for mortuary and archaeological data regarding death and mortuary processes, one must have an understanding of anthropological theory, an understanding of how middle-range theory can be used to bridge the relationship between mortuary practice(s) and their archaeological remnants, and an appropriate choice of analytical methods relevant to the questions addressed (Chapman 1987). Therefore, to contextualize the theoretical and methodological frameworks of this dissertation, an overview of the development of mortuary archaeology is provided, including both processual and post-processual paradigms. Bioarchaeological contributions are also reviewed to demonstrate how a combination of both mortuary archaeological and bioarchaeological perspectives can aid in a more holistic and biocultural approach. Finally, a selection of relevant anthropological theories will be discussed and related to this dissertation research.

4.2 Mortuary Archaeological Theory

Theory within mortuary archaeology has generally followed a similar trajectory with that of general anthropology (Chapman 1987). In the early to mid-nineteenth century, mortuary archaeology focused heavily on the classification of grave goods, following the trend seen in anthropology to classify living societies along an evolutionary scale. This was followed by a focus on social hierarchy in the late nineteenth and early twentieth centuries. Currently within the field of mortuary archaeology, there exist two main theoretical approaches: a revised processual approach that has responded and adapted to critiques of processualism and a post-processual approach (Rakita and Buikstra 2005). Although these approaches are often

conceptualized as separate paradigms, it is important to note that these two approaches are not dichotomous in that often perspectives from each approach are melded together when examining mortuary processes (Charles 2005).

Early approaches within archaeology and mortuary archaeology followed themes that were present within anthropology, such as the social evolutionary approaches proposed by Tylor and Spencer (Goody 1962) and the spread of culture through migration and movement and classifying people in terms of racial types (Soafer 2006). These approaches were later replaced by theories of Hertz (1960) and van Gennep (1960), who focused on the meaning behind mortuary practices. However, the assumption was that mortuary processes held social meaning and that this could be seen archaeologically (Rakita and Buikstra 2005).

4.2.1 New Archaeology and Processualism: The Saxe-Binford Approach

Following the New Archaeology processual approach, developed in the 1960s and 1970s, ethnographic and cross-cultural studies were used to attempt to identify and describe behavioral regularizes (Rakita and Buikstra 2005). To reconstruct the social organization of the society from the archaeological remains of mortuary practices, ethnographic examples of living societies were required (Chapman 1987). This required "the assumption that not all societies are unique and that there are general patterns in their organization and structure" (Chapman 1987:202). Processualism followed a scientific approach to data and sought to test hypotheses in order to establish generalizations that were often framed in terms of progress and process. Therefore, New Archaeology led to the development and utilization of middle-range theory, which allowed for connections (bridging) between archaeological theory and data and reconstructions of human behavior from archaeological remains (Soafer 2006). Middle-range theory links processes to

theory to inform past behavior and the formation of archaeological deposits (Bettinger 1991). Patterning present in ethnographic records, experimental studies, or observations can be compared to the archaeological record to make and evaluate inferences (Binford 1978, 1981).

New Archaeology put the body at the center of research, as it heavily utilized and emphasized the links between ethnography, behavior, and material culture (Soafer 2006). This also allowed for a development of an 'archaeology of death', which emphasized the direct link between the body and reconstructions of society and social organization (Soafer 2006). In his dissertation "Social Dimensions of Mortuary Practices", Saxe (1970) explored the placement of the dead and spatial relationships within mortuary practices. Through the use of cross-cultural ethnographic research, he was able to develop eight hypotheses relating to social personae and space, and specifically how disposal types reflected social organization. Hypothesis 8 was the most influential, which states that formal disposal areas will be maintained by corporate groups in order to control access to the land and resources (Saxe 1970). Using ethnographic data, Goldstein (1976) tested Saxe's Hypothesis 8 and found that Saxe's hypothesis was not multi-directional, as corporate groups will not always create formal and bounded cemeteries. Therefore, she re-worked his hypothesis, now known as the Saxe/Goldstein Hypothesis, to state that if there is a formal and bounded disposal area for the dead then the society most likely had corporate groups (Goldstein 1980, 1981). Morris (1991) re-examined the utility of the approach and found that it is applicable to some cultures, but it is not generalizable to all societies. He argued that the approach is still valid but should include more context. Brown (1995) also reviewed the Saxe/Goldstein hypothesis and found that critiques of the approach have been unwarranted and based on misconceptions in the application of the method. He argued that the

methodological approach of the method is sound, as he advocates for cross-cultural and regional approaches and examining the mortuary rite as a process.

Binford (1971) also examined social dimensions and disposal of the dead to and found that social personae vary based on the social complexity of that society. Mortuary practices were more variable as the complexity of the society increased (i.e. agriculturalist societies would display more variation in their mortuary program as compared to hunter-gatherer societies). As both Saxe and Binford had complementary cross-cultural approaches linking disposal practices with social complexity, this processual approach within mortuary archaeology has often been generally referred to as the Saxe-Binford approach, as they both "took a unified theoretical approach to a single kind of subject matter" (Brown 1995:10). The Saxe-Binford approach examines social organization to search for indicators of status and rank using the common assumption that there was a direct correlation between status and the burial.

4.2.2 Post-Processualism: Critiques of the Saxe-Binford Approach

Critiques of processualism and the Saxe-Binford approach began in the 1980s with what is generally known as post-processualism (Rakita and Buikstra 2005). This critique argued that the processual approach interpreted mortuary ritual and social complexity as having a direct correlation without acknowledging that mortuary rituals could be used as ways to negotiate, mask, or transform power and through this process an individual's status may be hidden or changed (Rakita and Buikstra 2005). Therefore, post-processual approaches cautioned against the cross-cultural generalizations seen in processualism and have incorporated new theoretical advancements and the inclusions of previously ignored aspects of mortuary rituals, such as gender, age, the body, and symbols. In post-processual tehories, the body is much more than

biology and can play other roles (Soafer 2006). Although post-processualism highly critiqued processual approaches, some aspects of processualism have can still be seen, including methodological approaches of middle-range theory (Soafer 2006).

4.3 Bioarchaeological Theory

Bioarchaeology links the study of human remains to their context, including cultural, social, and environmental variables in order to explain past human behavior (Martin et al. 2013). It focuses on the interaction and effects of behavior on biology, and it often emphasizes physical descriptions (osteology) of the body (Soafer 2006). Early studies in bioarchaeology in North America focused on developing a methodological science for studying ancient indigenous human remains and artifacts (Martin et al. 2013). This approach separated native communities from their pasts and ignored "the concerns and struggles of contemporary native people" (Martin et al. 2013:6). More recently, the Native American Graves Protection and Repatriation Act (NAGPRA) and other similar laws have required consultation with direct descendants for excavation and analysis of human remains to remedy this (Martin et al. 2013).

Due to early studies in bioarchaeology that focused primarily on skeletal remains, the field has sometimes been perceived as atheoretical due to its reliance on scientific principles, including experimentation, observation, prediction, and quantification (Soafer 2006). However, there are multiple implicit theoretical approaches within bioarchaeology, which have generally followed processual approaches (Soafer 2006). For example, bioarchaeology often relies on population and temporal comparisons, generalizations, universalism, and middle-range theory (Soafer 2006).

Bioarchaeology as a field has also evolved since its origination. Jane Buikstra (1977) initially sought to have physical anthropologists work more closely with archaeologists to answer regional, anthropological questions (Rakita 2014). The field has continued to grow from an osteologist who studied the remains alone to a bioarchaeologist who is involved in both the excavation and analysis and situates the human remains within their archaeological context (Larson 2006). However, as Goldstein (2006) has noted, although this process is difficult, it is important that both archaeological and biological data are integrated and neither treated simplistically.

Generally, approaches within biological anthropology have followed changes in archaeological method and theory, from a biological approach in the 1950s that focused on population-based analyses, to ecological approaches such as human adaptability that followed processualism of the 1960s and 1970s (Zuckerman et al. 2011). It was in the early 1980s that bioarchaeology as a sub-discipline developed after processualism pushed for a more holistic view and had established a scientific framework for interpreting ecological-based inquiry (Zuckerman et al. 2011; Martin et al. 2013).

More modern bioarchaeological and biological anthropological research has followed a biocultural approach in which osteological analyses are interpreted within a theoretical and multi-methodological framework (Zuckerman et al. 2011; Martin et al. 2013). Bioarchaeology pushed for a more inclusive study of human remains, combining contextual information with osteological data (Martin et al. 2013). The biocultural approach links "demographic, biological, and cultural processes within an ecological framework" (Martin et al. 2013:10) to identify the interactions between humans and their environment (Zuckerman et al. 2011). Specifically, it not

only considers the physical environment, but also the ecological, social, cultural, and political environments, that affect human adaptability (Zuckerman et al. 2011).

4.3.1 The Integration of Bioarchaeology and Mortuary Archaeology

As demonstrated, mortuary archaeology and bioarchaeology have had their separate developmental trajectories within anthropology. Early studies in biological anthropology and bioarchaeology often divorced the skeletal remains from their context and there was little attempt to understand the past behaviors and experiences of the people studied (Martin et al. 2013). In contrast, early studies in mortuary archaeology tended to focus on the burial context alone and often did not include, or even ignored, the people themselves (Goldstein 2006; Martin et al. 2013). This lack of incorporation of the two approaches has led to an incomplete picture of the past (Goldstein 2006). More recent research in both bioarchaeology and mortuary archaeology has addressed these criticisms and attempted to approach research from a holistic and biocultural manner, in which there is social, cultural, and biological contextualization, as well as the incorporation of theory to make improved interpretations of the past (Buikstra 2006, Goldstein 2006, Knudson and Stojanowski 2008; Martin et al. 2013).

4.3.2 Biases in Bioarchaeology and Mortuary Archaeology

As in any field of study, there are biases and assumptions in research for both bioarchaeology and mortuary archaeology. Information recovered from human remains and their contexts is often incomplete and how we record data is inherently biased (Martin et al. 2013). Assemblages of human remains are also biased, as detailed by the osteological paradox (Wood et al. 1992). In the osteological paradox, there are three main problems with interpretations drawn

from osteological data: demographic non-stationary, selective morality, and unmeasurable, individual-level heterogeneity in the risks of disease and death. Demographic non-stationary refers to how populations are not static through time. Instead, there are migrations, fluctuations in fertility and mortality, growth rates, and unequal age-at-death rates, all of which will have large impacts on the skeletal population. For example, if fertility is high, the average age-at-death will be lower, making the population appear less healthy. Therefore, age-at-death for a skeletal population is more reflective of fertility than mortality. Selective mortality is based on the skeletal sample being composed of dead individuals, meaning that we only know the individuals who died at a given age, but we don't know who were at risk of death and survived. Therefore, observed pathological conditions will overestimate the true prevalence, as we cannot see those who had the disease and recovered. Finally, hidden heterogeneity in risks refers to individual frailty, as each individual has their own risk of morbidity and mortality due to multiple factors, including genetics, immunity, location, and socioeconomic status. Those who have visible signs of stress often have less frailty, as they were able to survive the stressor, while those who did not have any signs of the stressor may have died prior to them forming on their skeleton. As we cannot know individual rates, context-driven population estimates are made. We must be aware of these factors when conducting osteological-based research (Wood et al. 1992). More recent discussions of this paradox have framed it as an over-simplification of an individual being healthy or unhealthy (Siek 2013) and call for a multidisciplinary approach (Wright and Yoder 2003; Siek 2013; DeWitte and Strojanowski 2015). Siek (2013) argues that the study of disease should use a biocultural approach using multiple lines of evidence, as this approach would view disease as a result of (and having an effect on) both biology and culture, instead of classifying the individual as healthy or unhealthy, as health is a spectrum.

4.4 Theoretical Framework of Dissertation

This dissertation utilizes multiple social theories about the body and personhood, as well as fragmentation. The use of these theories will allow for an examination of how people conceptualized themselves and human remains before and after fragmentation.

4.4.1 The Body, Personhood, and Agency

The body is a symbol of ideology and interaction and is at the center of the relationship between society and material culture (Martin et al. 2013). Scheper-Hughes and Lock (1987) identified three types of bodies that each individual possess: the biological body, the cultural body, and the political body (Martin et al. 2013). The biological body can be reconstructed based on the skeletal remains, using estimations of age, sex, stature, health, and other variables (Martin et al. 2013). The cultural body can be assessed using archaeological and mortuary context of the skeletal remains, such as site descriptions, burial location, and presence of burial goods, to estimate information about individuals lives (Martin et al. 2013). Finally, the political body can reveal evidence of social control, violence, politics, or other forms of domination by examining health and trauma (Martin et al. 2013).

Sofaer (2006) argued that there is a divide within archaeological studies of the body, in that there are two distinct approaches that are not often used in conjunction: science-based approaches focusing on skeletal biology and social theory approaches that view the body as a social construct. New Archaeology established how archaeologists and osteologists approach the body methodologically. Specifically, New Archaeology placed the body at the center of research, used social variables to interpret the body, and placed emphasis on scientific methods (Soafer 2006). This approach allowed for three areas of research on the body to develop: the living body,

the dead body, and the osteological body (Soafer 2006). Post-processual archaeology emphasized the agency in bodies; however, it still tends to greatly emphasize the osteological body (Soafer 2006). Humans are made up of multiple components, including the biological, social, and psychological. However, bioarchaeologists have traditionally focused primarily on the biological (osteological), while archaeologists have attempted to examine the social and psychological (living bodies) (Soafer 2006).

Archaeological approaches to the body have generally focused on phenomenology and embodiment (Soafer 2006). Embodiment stresses emotion and experience of the individual, bounded by the body. The phenomenological approach "has largely centered on the generalized experience of living, moving bodies in relation to landscape, monuments or architectural space" (Soafer 2006:21). Within the phenomenological approach is the idea of the dividual self (Soafer 2006). As the idea of the individual stresses personal uniqueness, the alternative fractal or dividual self sees the self both as an individual and as multiple elements comprising the whole. Identities may not have existed solely within the physical body (Soafer 2006), with boundaries between people, objects, and animals constantly in flux (Brück 2006). Within dividuality exists partibility, in which parts of the dividual person can be extracted and given to someone else, and permeability, in which qualities can flow between and through people (Fowler 2004). Although these concepts are culturally constructed, as modes of personhood, they allow for the interpretation of how that personhood is created, maintained, and transformed.

The body can be visualized in many ways, including as partible or dividual, literal or a metaphor, an artifact or living being, universal or culturally specific, and often relates to how one views their identity (Brück 1995; Hamilakis et al. 2002; Soafer 2006). "Throughout the life course the body is both subject and product of processes and is constantly modified" (Soafer

2006:57). The concept of the individual and individuality are generally seen as modern and Western (Fowler 2004, 2008; Brück 2006), while a dividual, permeable, and partible body views the person as a collective without boundaries and can be broken into many parts (Fowler 2004, Brück 2006; Budja 2010; Geller 2012; Duncan and Schwarz 2014). Ethnographic studies show that dividual and partible ideas about the body are fairly common, and thus it is not unreasonable to believe that these same ideas may have existed in the past (Geller 2012).

Specifically, there have been two main ways archaeologists have examined the fractal body: metaphors and fragmentation. The fractal person extends beyond the metaphor, in that "these things do not stand for each other, they are produced out of each other" (Fowler 2008:48). Additionally, fragmentation has often been used to identify fractal persons; however, there are other aspects to fractal relations as well. "While fragmentation occurs somewhere in the mortuary process in many communities … it does not always indicate the same understanding of fractal relations as enchainment via objects or fragments with specific biographies" (Fowler 2008:52).

Archaeology often makes a distinction between bodies and objects; "the living body is regarded as a person but as soon as the transition to death is made, the body becomes an object" (Soafer 2006:62). However, the distinction between the two is not clear, as bodies may be metaphors for objects and objects can function as persons, having biographies and social identities themselves (Chapman 2000; Fowler 2004; Soafer 2006). As the body and objects are both "*material and social*", the body can be viewed as material culture and better suited to archaeological investigation (Soafer 2006:85). Bodies and body parts, therefore, are material objects themselves and can be used to make "material statements" (Soafer 2006:64). These commodified bodies, such as relics, trophies, slaves, tools, can hold symbolic meanings.

Human remains, like people and objects, can also have agency. Although human remains are non-sentient, their agency still has an effect on the living and can shape the social actions of human beings (Tung 2014). Commodified bodies can therefore serve multiple purposes, including manipulating or maintaining relationships, creating and controlling identities, serving as objects of veneration or trophies or warfare, or having magical significance (Tung 2014; Knüsel and Robb 2016). According to Chapman (2000), the fragmentation of objects or human remains allowed for the living to maintain a part of their ancestors and to continue to interact with them. By breaking the human remains into fragmented and mobile pieces, the exchange of these commodified bodies and objects allowed for people to create and maintain social relationships between living individuals as well as ancestral links to the dead, in a process referred to as enchainment (Chapman 2000; Fowler 2004). Human remains that were further modified may have functioned as a symbol of these relationships or group identity. These artifacts were born with their production and ended with their death or discard and have taken on their own life- (and death-) course (Hargrave and Cook 2015:129).

4.4.1.1 Postmortem Processing

As the body can be dividual and fractual, postmortem treatment of the body can include the fragmentation of human remains through postmortem processing. As theories of the body seek to understand the meaning of postmortem fragmentation, it is also important for the osteologist to distinguish and understand postmortem procurement of human remains. Fenton (1991) described three main patterns for postmortem body processing: (1) The idiosyncratic model, which is the exhumation and curation of human remains to create a relationship between the deceased and the survivors. This would be seen archaeologically as removal of certain

skeletal elements from specific individuals. (2) The public ritual model, which is when many individuals are exhumed and venerated. This would be seen archaeologically as the removal of specific elements from one location and then a reburial of those elements in a second location. (3) The hegemonic display model is seen in societies that construct facilities to curate remains, often to demonstrate status differences. Fenton (1991) aruged that interments of partial skeletons or isolated elements should not be viewed as an incomplete social persona, but rather as evidence that these elements were used as symbols or memento mori of the deceased's social persona.

Postmortem processing can be interpreted in terms of collective representation, in which it causes a loss of individual identity and a transformation to an idea of a collective identity, with the bones themselves forming a narrative (Hertz 1960; Kuijt 1996; Goldstein 2000; Brown 2003, 2010). It is during this process that people are no longer thought of as individuals, and the bones themselves become artifacts (Brown 2003).

4.4.2 Contextual Approach

As the theories regarding the body serve to hypothesize why past individuals may have fragmented human remains, the final depositional context of those remains is also important in fully understanding their meaning. "To distinguish between techniques and meanings, biographical consideration of body partibility – contextualization of bodies and their associated materials within physical space, cultural setting, and historic period – is necessary" (Geller 2012:125). The final deposition of human remains, such as primary burials, isolates within refuse pits or structures, or any location where human remains are stored, are places reflecting social relations and can function to maintain memory (Hendon 2000). According to Chapman (2000),

spaces are transformed into links to ancestral spaces, as they gain memory. The longer a place is inhabited, the longer it will accumulate memory, and create a greater ancestral link.

The locations in which human remains are recovered, as well as the larger archaeological context, must be taken into account, as context can provide "information on such things as habitation and work areas, ceremonial architecture, food storage, material objects used in everyday life (such as ceramics and lithics), and domesticated plants and animals" as well as "ideology and culture" (Martin et al. 2013:60). These "structured deposits" are patterned both in their associations and disassociations between other objects (Hill 1995). Therefore, any discussion of context should include spatial location and association with other objects, including cultural and natural items (Lyman 1994).

This can be achieved through a contextual approach, in which archaeological context, patterning, and taphonomic processes are considered in order to ascertain specific ways in which human remains were selected to be used in practices that may have served to reproduce, negotiate, or strengthen social relationships (Brück 1995; Chapman 2000; Chapman and Gaydarska 2007). Human remains found in specific contexts demonstrate that there are specific rules dictating where these human remains can be deposited (Brück 1995). For example, bones found within the settlement, in places that would have been frequently encountered, may be reflective of a way to link the living to the dead ancestors; while human remains found in postholes near entrances and exits to the settlement may suggest boundaries or links to the land (Brück 1995).

4.4.2.1 Trash or Ritual Artifact?

Fragmentary and culturally modified human remains at Oneota sites are often found in non-burial features, often those labelled as trash or refuse pits. Following the contextual approach, the specific context of human remains in a refuse deposit is meaningful. However, it should be noted that our Western ideas of trash should not cloud our interpretations. Instead, archaeologists should revise our ideas of what we consider an artifact to end "the distinction between people, objects, and architecture and to expand artifacts to include all materials – animate and inanimate – that interact with people" (Walker 1995:73). Specifically, this can change the way we view and think of 'trash.'

Walker (1995:73) coined the term "ceremonial trash," in which the life of the object is complete and these objects "can no longer perform their technological functions and cannot be reused or returned to the processes of manufacture." When these items are encountered archaeologically, they are typically interpreted as "killed deposits, votive offerings, and ritual caches" (Walker 1995). Many of these same artifacts are placed in refuse contexts, adding to the idea that they may be seen as trash, resulting from violence or sacrifice. However, as Walker (1995) noted, these contexts are places that remain accessible and can be monitored and protected.

Both Hill (1995) and Thilderkvist (2013) attempted to identify and distinguish between deposits considered to be refuse and those that may have ritual meaning. Structured deposits can be examined by identifying patterning in associations and disassociations between materials and their spatial arrangements are examined (Hill 1995). Many of these deposits may appear to be or have been labeled as refuse; however they may contain deeper meaning (Hill 1995). Thilderkvist (2013) developed and argued for a five-step process to identify ritual activity: starting with clear

definitions, detailed descriptions, the identification of the ritual deposits by examining any deviations for what is considered normal, interpreting the actions that produced the deposits, and explaining the activities using archaeological and taphonomic methods, as well as historical and ethnographic sources to make analogies.

4.4.3 Violence

Using a contextual approach aids in the understanding of the processes that led to the objects final disposal. This includes distinguishing between acts of veneration and violence; especially as fragmented and culturally modified human remains have often been used as examples of trophy-taking (Chacon and Dye 2007). Acts of veneration aid the soul and honor their memory, while violation denies destroys the soul or denies it rest. Within violation exists negative and positive predation, in which negative predation prohibits the deceased from receiving the proper rituals and positive predation uses the vitality of the victim (Duncan 2005).

In addition to distinguishing between acts of violation and veneration, researchers have also attempted to theorize violence, especially warfare, in the past. These approaches have generally followed two major paradigms for interpreting evidence of violence in the archaeological record: (1) warfare is linked to increases in social complexity, and (2) warfare has been present since the beginning of our species and violence is adaptive and a cooperative act (Ferguson 1997; Martin et al. 2013). However, violence is complex and requires more detailed theoretical approaches, as well as specific considerations about the culture (Martin et al. 2013).

Additionally, violence and warfare have often been defined differently by researchers. For example, definitions of warfare have ranged from any group violence (Otterbein 2004); a relationship among groups within a social system (Ferguson 1997); raiding, ambush, intercommunity violence, and intra-ethnic or tribal clashes" (Martin et al. 2013:223); and

politically organized violence (Dye 2009). Violence has also been subdivided into physical, structural, and culturally sanctioned violence (Martin et al. 2013). Physical violence is best described as interpersonal violence, while culturally sanctioned violence refers to raiding or warfare (Martin et al. 2013). "Structural violence involves all of the cultural, political, and social institutions that legitimize and sanction certain kinds of violence" (Martin et al. 2013:78). In order to assess violence in the past, especially structural violence, bioarchaeologists need to address the political body, as defined by Scheper-Hughes and Lock (1987) (Martin et al. 2013).

While physical violence is usually much easier to see, leaving permanent marks on bodies and bones, other forms of violence can often be overlooked. These hidden forms of violence are often obscured and are therefore difficult to observe and interpret. In addition, violence has often been categorized as legitimate or illegitimate, further confusing the definition. "Anthropologists have a responsibility to attempt to (re)construct the past without reducing the events to some simplistic notion of deviant behavior that is simply labeled (e.g., cannibalism, raiding, warfare) but is not explained" (Pérez 2012:14-15). Through the examination of trauma, pathologies, warfare, and disease, it is possible for aspects of this violence to be elucidated (Martin et al. 2013).

When examining violence as a possible explanation, researchers have often focused on the presence of archaeological indicators, such as defensive sites or fortifications, the presence of weapons, or iconography. However, these indicators may be reflections of prestige or other social indicators as much as they are about violence and warfare (Knüsel 2005). For example, researchers have often assumed that the presence of a palisade is representative of a fortification due to violence in the area (Dye 2009). Although this is one reason people may choose to build a wall around their settlement, other explanations also exist. Schroeder (2006) argued that walls

are “symbolically charged structures” and can have both vertical and horizontal forms; the former used to establish and/or maintain alliances or chiefly office, while the latter representing social, political, ideological, and/or symbolic agendas. It is evident that although walls may serve defensive purposes, that is not necessary their only or even their main purpose.

It is known that even when warfare is endemic, archaeological indicators of this do not often survive (Knüsel 2005). The best indicators of violence are those that come from mortuary deposits and the skeletal remains themselves, such as missing or repositioned skeletal elements, isolated elements, additional skeletal elements in burials, and modified bone (Knüsel 2005; Schwitalla et al. 2014). These indicators need to be considered in context, as these factors can be the result of multiple processes. Studies of archaeological violence have also often focused on violence found at one site but have not looked on a regional scale. Walker (2001) recommends that trauma should be studied on a population-level not only to determine when violence occurred in the past, but also to understand the intensity of violence (Knüsel 2005).

Therefore, these interpretations must include theory of violence in addition to the archaeological evidence of violence, such as trauma seen on skeletal remains, iconography, weapons, and settlement fortifications, in order to attempt to reconstruct events in past populations and to avoid mischaracterizations of past populations. Archaeological context is critical to adequately interpret violence and warfare, as well as inclusion of data on environment, population movement, sociopolitical organization, and subsistence and settlement patterns, as these would all have had influences on violence in the region (Milner 1999). Violence and warfare are complex and there are multiple other processes that may result in similar patterning (Knüsel 2005).

4.5 Summary

This dissertation seeks to address the fragmented and culturally modified human remains that are often encountered at Oneota sites by utilizing specific theoretical approaches. To understand why human remains were fragmented in the past, theories regarding the partible nature of the body will be used (Chapman 2000; Duncan and Schwarz 2014). Middle-range theory using ethnographic accounts will aid in this understanding and serve to frame the iconography sometimes seen on culturally modified human remains (Binford 1971, 1981). A contextual approach will be used to hypothesize the meaning of the final depositional location of these remains (Thilderkvist 2013; Brück 1995; Hill 1995; Walker 1995; Chapman 2000). Finally, theories defining violence, in addition to ethnographic resources, will be used to evaluate violence or trophy-taking is a possible explanation for culturally modified human remains found at Oneota sites (Knüsel 2005; Martin et al. 2013).

CHAPTER 5: MATERIALS

5.1 Introduction

A total of six (6) sites located in Iowa, Illinois, and Wisconsin were selected for analysis for this research (**Figure 2**). Each met several criteria including the cultural designation of "Oneota." the presence of primary and/or secondary human burials, an associated village, and the presence of fragmented and/or culturally modified human remains. An exception was given for sites located in Iowa, as burial laws have prohibited excavation of human remains, and therefore the human remains from Iowa Oneota sites often consist only of remains found in village contexts or those that could not be protected *in situ*. There were multiple sites that were excluded based on lack of spatial and contextual data for the human remains. Although these remains could not be used in statistical analysis, many are discussed in relationship to the results in later chapters.

Figure 2: Distribution of Oneota Sites

Every attempt was made to choose sites that represented differences in interaction, phases, or temporal period so that comparisons could be made on a larger, regional scale. Additionally, these sites are generally well documented and have associated archaeological and archival records, including publications and site maps. Permission to use the data came from the corresponding institutions.

5.1.1 Illinois

The two Illinois Oneota sites used for this dissertation are the Hoxie Farm site in northeastern Illinois and the Morton Village site and associated Norris Farms 36 cemetery in central Illinois. In modern northeastern Illinois and northwestern Indiana, there are three recognized Upper Mississippian phase groups associated with the Oneota: Langford, Fisher, and Huber. As with most cultural phases, these were originally defined based on differences seen in material culture, especially ceramics (Jackson 2013a:28). Although Langford groups were contemporaneous with Fisher and Huber and there was interaction between them, it is believed that these groups maintained separate identities (Markman 1991). For instance, Langford groups had grit-tempered ceramics, which contrasts with the mainly shell-tempering of Oneota groups, although Markman (1991) believes that other aspects of the ceramics are Oneota-like. As for Fisher and Huber groups, it is believed that earlier Fisher groups, dating to around 1100 to 1350 AD, eventually developed into later protohistoric Huber groups (O'Gorman and Lovis 2006, Jackson and Emerson 2013c).

The Morton Village and associated Norris Farms 36 sites are located in central Illinois. Within the Central Illinois River Valley is the Bold Counselor phase Oneota, in which sites are typically near bluff edges, on defensible ridges, and near small creeks (Esarey and Santure

1990b). Bold Counselor phase sites display evidence of interaction with Middle Mississippians, especially influences in material culture, including pottery (Esarey and Santure 1990b). It is generally argued that Bold Counselor phase Oneota populations originated from near the upper Mississippi River Valley and migrated to the Central Illinois River Valley in the middle/late thirteenth century and occupied the region until the early fifteenth century, following a general abandonment of this region (Esarey and Santure 1990b). It is also believed that these populations had ties to Early Mississippian groups, which may have influenced their interaction with the Spoon River Mississippian groups in the Illinois River Valley (Esarey and Santure 1990b).

5.1.1.1 Hoxie Farm (11CK4)

The Hoxie Farm site is a late Fisher and Huber phase Oneota site in the modern south suburban area of Chicago (Jackson 2013d). It is located on a sandy terrace landform, east of Thorn Creek and situated near prairie, marsh, and woodland environments (Herold et al. 1990; Jackson 2013e). The site consists of two major areas: a main occupation area (Jackson 2017c) and a fortified village (Jackson and Emerson 2013c). The fortified village site is estimated to have been around 4.4 ha and was spatially distinct and more heavily occupied than the main occupation area (Jackson 2013d:3; Jackson and Emerson 2013a).

The Hoxie Farm site complex is a large, multi-component site that was intensively occupied between the fourteenth and sixteenth centuries (Jackson 2013d). The Hoxie Farm fortified village site is assigned to the late Fisher phase, while the main occupation area has evidence of both late Fisher and Huber phases (Jackson 2013f). The occupation is believed to have primarily occurred during the “first three-quarters of the fourteenth century” (Jackson and Emerson 2013b:187). Cultural material densities also suggest that the fortified village site was

occupied short-term, “possibly not much longer than a decade” (Jackson and Emerson 2013b:187).

The Hoxie Farm site complex was first recorded in the Cook County history volume in 1884, where it mentioned having evidence of artifacts, mounds, fortifications, and villages (Jackson 2013c). The site was later investigated by Albert Scharf, who documented Native American villages in the late nineteenth century (Jackson 2013c). He described the lithic diversity of the site and the abundance of triangular projectile points (Jackson 2013c). Scharf also noted multiple earthworks at the site and that the site was located near important land and water trails (Jackson 2013c). During the early twentieth century, archaeologists from the University of Chicago visited the site, although the extent of their involvement with the site is relatively unknown (Jackson 2013c). It was not until 1953 that extensive excavations of the site took place during the construction of a highway system in the area (Herold et al. 1990; Jackson 2013c). The excavations were conducted under the direction of Elaine Bluhm (later Elaine Bluhm Herold) from the Field Museum of Natural History and David J. Wenner (Jackson 2013c). During excavations, over 50 features were uncovered, eleven of which were burials and four others that were suspected to have been burials (Jackson 2013c). Artifacts found at the site included catlinite, copper, and galena, indicating a vast trade network (Herold et al. 1990). Unfortunately, during this time the site was heavily looted, including burials, leading to major problems with site interpretations (Jackson 2013c).

Further excavations were conducted in 1962 by Ed Lace and in the late 1970s by the Forest Preserve (Jackson 2013c). Formal Phase I archaeological surveys were conducted in 1999 by the Illinois State Archaeological Survey (ISAS) for a highway project to widen the FAI-80 corridor (Jackson 2013c). The survey demonstrated that the project would impact five

archaeological sites: the Hoxie Farm site (11CK4) and 11CK123, 11CK370, 11CK373, and 11CK705; the latter four are believed to be small occupation or temporary-use sites (Jackson 2013c).

In the spring of 2000, the four other sites along the project corridor were investigated but showed evidence of disturbance and/or were outside of the construction area and were thus eliminated for subsequent archaeological excavations (Jackson 2013c). During the spring and fall of 2000, phase I investigations took place at the Hoxie Farm site and showed little evidence of disturbance by the previous I-80 construction (Jackson 2013c). More detailed excavations occurred at the site in the fall of 2000 and demonstrated that cultural material was present in undisturbed features. Phase II investigations were conducted in the spring of 2001 to more thoroughly examine the site, determine if human burials were present, gauge material culture densities, and evaluate what impact the construction of the I-80 corridor would have on the site (Jackson 2013c). Phase II excavations uncovered 545 features, including shallow and deep pits, hearths, earth ovens, and post molds, as well as a portion of a longhouse (Jackson 2013c). A few burial features were located on the north side of the site and isolated human remains were found in midden deposits, pits, and backdirt from looters (Jackson 2013c). Phase III excavations took place in 2002 and 2003 and were concentrated on the south side of the site (**Figure 3**). These excavations uncovered similar features as well as at least one additional longhouse (Jackson 2013c). It was found that material culture density was more concentrated in the north area of the site (Jackson 2013c). Excavations in the southeast area, which had not been investigated previously, demonstrated evidence of a fortified village (Jackson 2013c).

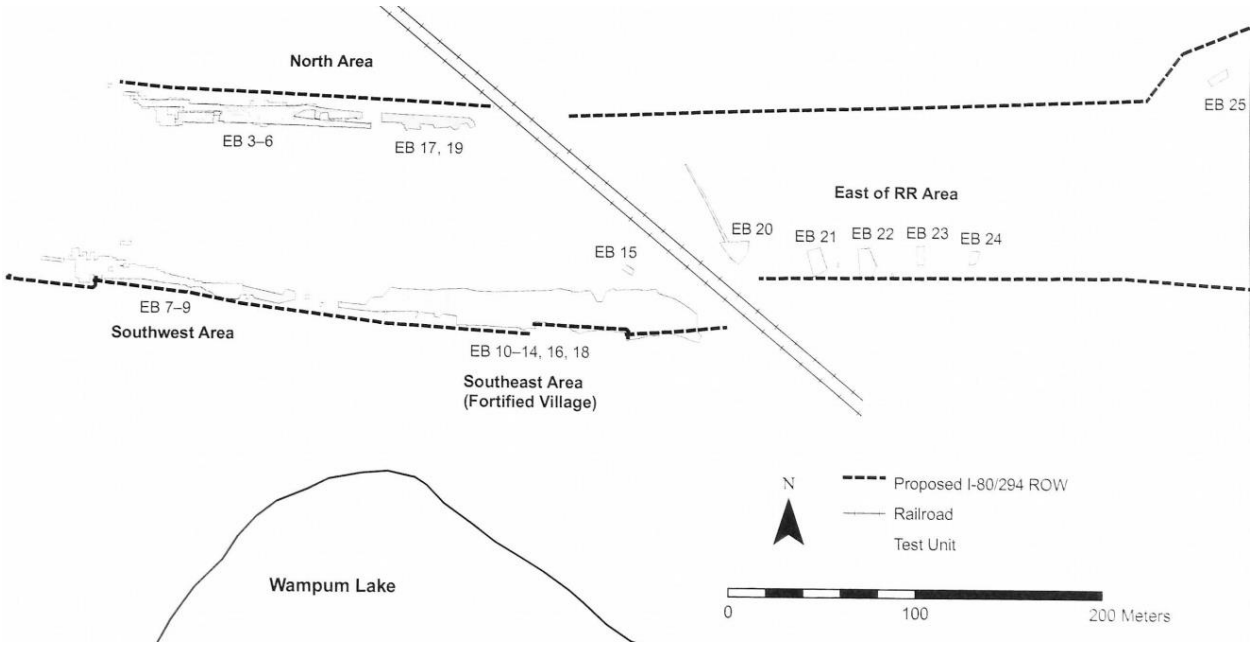

Figure 3: ISAS Excavations at the Hoxie Farm Site (Jackson and Emerson 2013c:56)

A total of 495 features were encountered within the fortified village area of Hoxie Farm, including hearths, post molds, ditches, a palisade, and at least one burial (Jackson 2013b). Differences in structure type were noted between the fortified village area and the main occupation area (Jackson 2013b). The main occupation area contained longhouse structures, while the fortified village had "circular-to-oval basin or pit structures" that were semi-subterranean structures within an excavated basin (Jackson 2013b:76). Of note, "these types of structures have not been found outside of the Fortified Village area" or "in other investigated areas of the site or at other contemporary sites in the Chicago region" (Jackson 2013b:78). It is believed that the presence of two types of house structures (earlier longhouses in the main occupation area vs. later circular and oval basin structures in the fortified village) are attributable to temporal differences, as well as social changes that would have spurred changes in house style and/or residence patterns (Jackson 2013b).

Several different types of pit features were found at the fortified village site. Sidewall pits (interior pits that extended beyond the basin structure) and interior pits functioned as storage (Jackson 2013b). Non-structure pits ranged in size, with small and medium pits used for storage, shallower pits used for food storage or processing, and large pits for food storage (Jackson 2013b). Two types of defensive systems were found: a palisade consisting "of a single line of individually set posts" and four ditches (Jackson 2013b). The ditches and palisade run parallel, with the palisade closest to the village (Jackson 2013b). Jackson (2013b:179) argued that the "primary purpose of the fortification complex was, of course, to protect the villagers from being overwhelmed by a surprise attack" and that the "construction of the ditch features and the palisade indicates that the inhabitants believed such an investment of labor was necessary for the protection of the community." However, fortifications may serve as more than just a physical barrier; it may show the possibility that the villagers can defend themselves and bring a sense of security, no matter how effective the fortifications really are (Jackson 2013b). Based on the presence of the palisade and ditches, Jackson (2013f:198) supposes that the occupants were under a "real or perceived threat" from at least one neighboring group.

Additional excavations have divided the site into a fortified village, main occuration area, and an east area (Jackson 2017a:1). The main occupation area was further divided into four areas: northwest, north-central, northeast, and southwest (Jackson 2017a:1). Longhouse structures were identified and believed to be related to the Huber phase (Jackson 2017b:35). Excavations at the main occupation area of the Hoxie Farm site revealed 29 burial features in addition to human remains found in the plowzone, middens, pits, and postmolds (Hargrave et al. 2017:325).

Human Remains

Human remains were found during the 1953 excavations of the village, consisting of eleven burials, including males and females, adults and children (Herold et al. 1990). The individuals were primary interments, most of which laid in an extended, supine position (**Figure 4**). Of note, pots were found with two adult males, while a canid bone was found with one female burial and an "otter skull with conical copper eye sockets" was found with another female burial. The latter was similar to one found at the nearby Anker site (Herold et al. 1990:86).

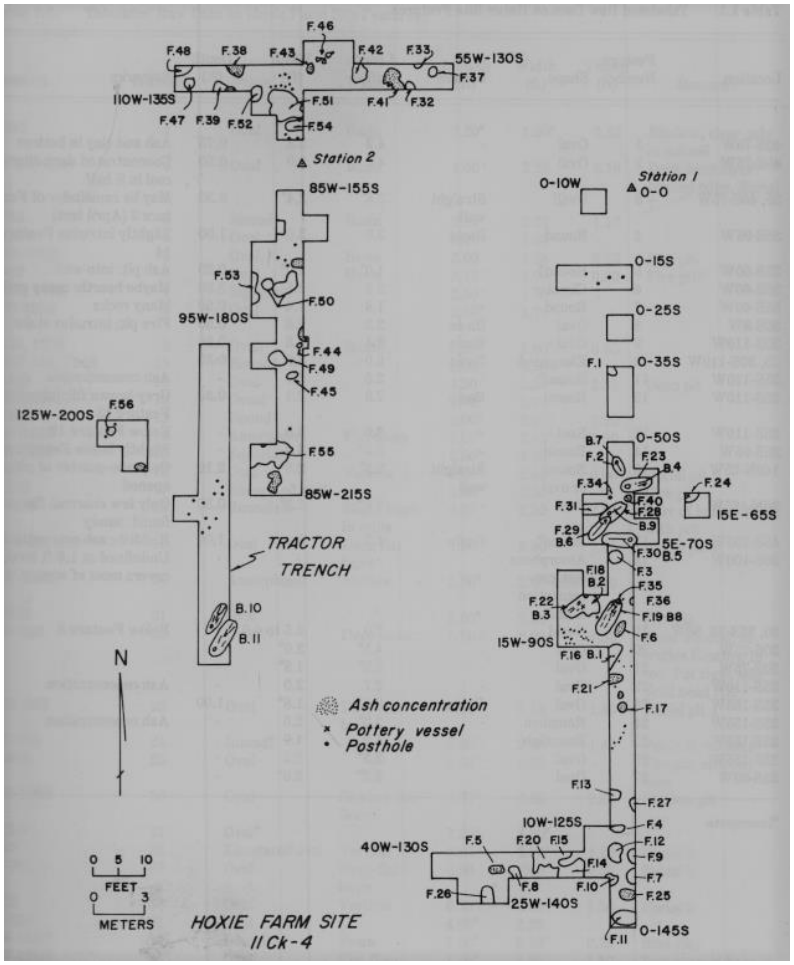

Figure 4: Burials at the Hoxie Farm Site from the 1953 Excavation (Herold et al. 1990:15)

During the ISAS excavations, human remains were encountered at both the fortified village and main occupation area at Hoxie Farm (**Figure 5**). At the fortified village, "seven

individuals were recovered from one burial feature, two possible burial features, and four habitation-related features" (Fricker et al. 2013:413). The single burial consisted of a cluster of dental remains, and two other possible burial features also consisted of isolated teeth (Fricker et al. 2013). Additional burial features were also located and identified based on feature characteristics but did not contain evidence of human remains (Fricker et al. 2013). Many of these possible burial features were located on the western portion of the fortified village, which may have functioned as a small cemetery (Fricker et al. 2013). Cultural material was found both within the burial features and possible burial features, which has been described as "incidental refuse included with the feature fill" (Fricker et al. 2013:419).

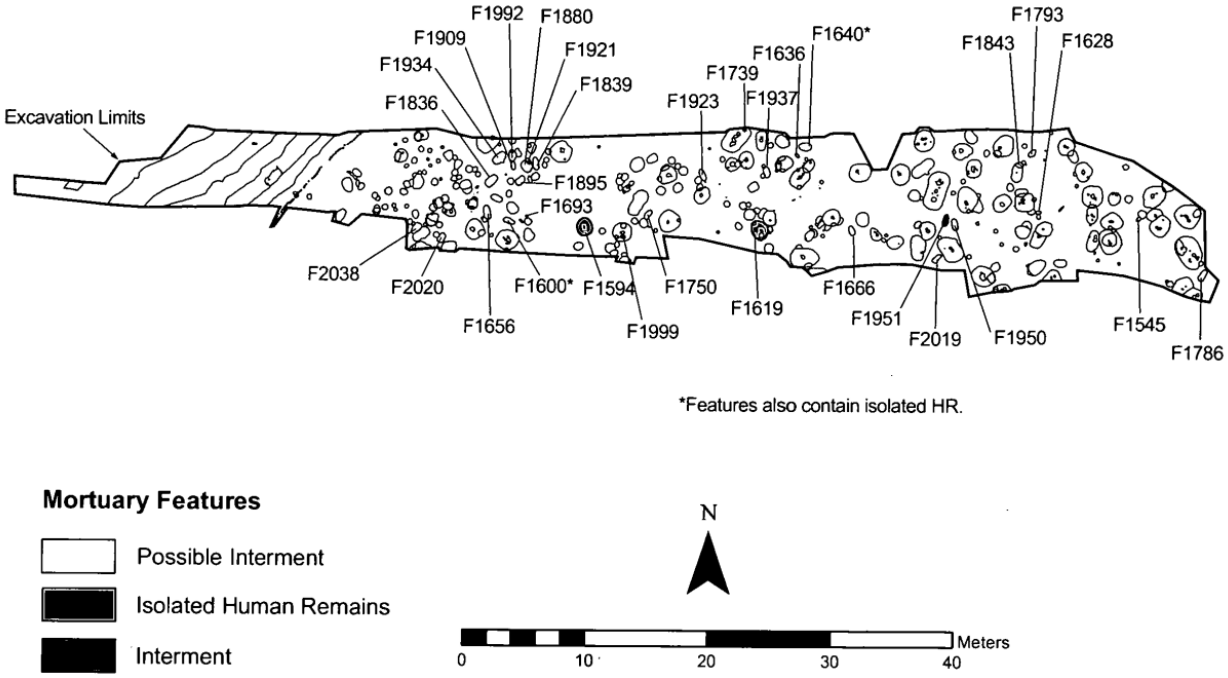

Figure 5: Burials and Human Remains from the Fortified Village at the Hoxie Farm Site (Fricker et al. 2013:418)

Isolated human remains were also found in non-burial features at the fortified village portion of the site. These remains were found in features located in structures and included long

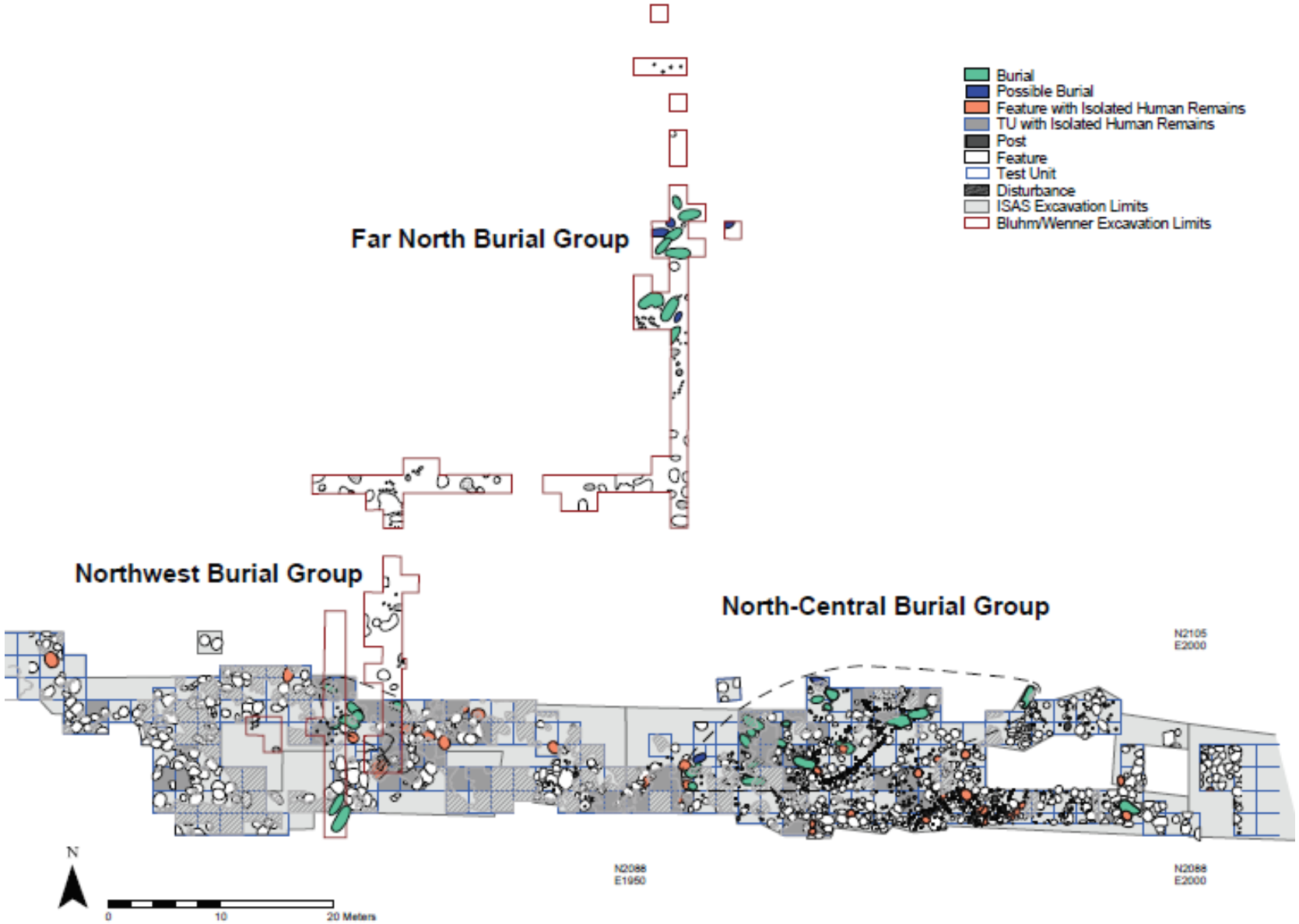

Figure 6: Burials and Human Remains from the Main Occupation Area at the Hoxie Farm Site (Hargrave et al. 2017:327)

bone fragments, dental remains, and phalanges. A hearth feature contained burned distal phalanges that were absent any cutmarks (Fricker et al. 2013:426).

Human remains were also encountered during the ISAS excavations of the main occupation area of Hoxie Farm (**Figure 6)**. Twenty-nine burial features were encountered within habitation areas, including multiple isolated human remains found in the plowzone, middens, pits, and in looted areas of the site (Hargrave et al. 2017:325). Burials located within the main occupation area of Hoxie Farm were in four separate areas of the site (Hargrave et al. 2017:384). Test units at the site also uncovered human remains, often located in middens and non-burial features (Hargrave et al. 2017:328). The human remains found in these pits were often fragmentary and only contained a few elements (Hargrave et al. 2017:329).

For the human remains found over multiple excavations, most were tertiary human remains, some of which had additional cultural modification (**Table 2**). Evidence of trauma was also identified on multiple individuals recovered at the main occupation area. This includes probable accidental trauma, as well as some evidence for interpersonal violence such as healed depression fractures and evidence of scalping (Hargrave et al. 2017:363).

Table 2: Cultural Modification of Human Remains from the Hoxie Farm Site

	Primary	Secondary	Tertiary	Multiple	Unknown	Total
None	20	1	39	2	11	**73**
Scalping	1	0	0	0	0	**1**
Cutmarks	0	0	4	0	0	**4**
Burning	0	0	9	0	0	**9**
Total	**21**	**1**	**52**	**2**	**11**	**87**

Herold et al. (1990); Fricker et al. (2013); Hargrave and Hedman (2017)

Additional modifications, such as burning and cutmarks, were present on some tertiary remains (**Table 3**). The scattered remains of one individual appeared to have been fragmentary prior to burning. Many of the fragments were recovered from pit features (Hargrave et al.

2017:365). There were also multiple isolated femoral heads and cranial fragments that were burned and found in pit features, again appearing to have been fragmented prior to burning (Hargrave et al. 2017:365-6).

Table 3: Human Remains with Additional Cultural Modifications from the Hoxie Farm Site

Feature	Context	Age	Sex	Elements	Cultural Modification
F1739*	interior feature-hearth	adult	indeterminate	2 distal hand phalanges	burned
F329/F322	within burial feature of infant	adult	indeterminate	parietal fragments	incised chevron design
BW F16, Bur 1	burial	adult	male	parietals	cutmarks (scalping)
F1013	non-burial feature	adult	indeterminate	parietal fragment	burned (associated with TU356)
TU356	test unit	adult	indeterminate	frontal and parietal fragment	burned (associated with F1013)
F913	non-burial feature	adult	indeterminate	frontal fragment	burned
TU347	test unit	adult	indeterminate	frontal fragment	cutmarks
F1048	non-burial feature	adult	indeterminate	femur fragment	burned
F1135	non-burial feature	adult	indeterminate	femur fragment	burned
F144	non-burial feature	adult	indeterminate	parietal fragment	cutmarks
F449	non-burial feature	adult	indeterminate	parietal fragment	burned
F767	non-burial feature	adult	indeterminate	parietal fragment	cutmarks
F808	non-burial feature	adult	indeterminate	femoral head	burned
TU63	test unit	adult	indeterminate	temporal fragment (petrous)	burned
TU97	test unit	adult	indeterminate	frontal fragment	burned

*Fricker et al. (2013); Hargrave and Hedman (2017)

Postmortem cutmarks were also found on multiple isolated and fragmentary human remains crosshatching (Hargrave et al. 2017:373). Fragments of a parietal bone from two separate features (F329 and F322) were reconstructed and found to display an incised design of triangles and crosshatching (**Figure 7**). Feature 329 was originally a domestic pit feature in which this incised cranial fragment and an additional tibia shaft were discovered.

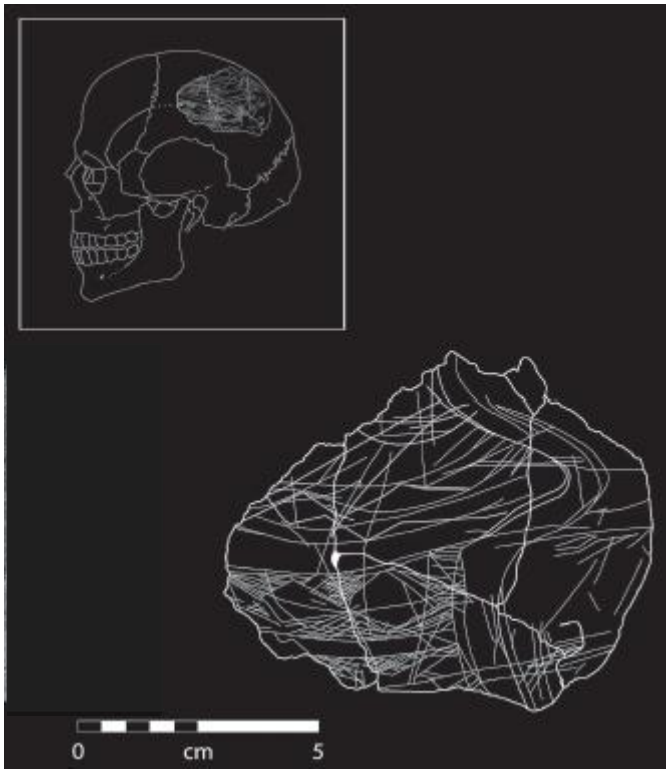

Figure 7: Incised Left Parietal, Features 322 and 329 from the Hoxie Farm Site (Hargrave et al. 2017:373)

This same feature was then later used for the interment of an infant (Hargrave et al. 2017:369). Based on the absence of processing found on other human remains, Hargrave et al. (2017:405) suggest that isolated fragments with cutmarks and burning may instead represent "remains of enemies, rather than Hoxie Farm residents themselves."

Summary

The Hoxie Farm has been subjected to multiple excavations, the latter of which have intensively uncovered two major site areas: a fortified village and main occupation area. Early excavations of the site encountered burials, some of which were donated by Ed Lace and later re-analyzed by Hargrave and Hedman (2017) and included in this research. Excavations of the fortified village, located in the southeast area of the site, demonstrated an intensely occupied site

with evidence of longhouses and a palisade. Portions of the main occupation area were also excavated. Most burials and isolated human remains were recovered from the main occupation area, although a few specimens were also encountered at the fortified village.

5.1.1.2 Morton Village (11F2) and Norris Farms 36 Cemetery (11F2167)

The Morton site complex, a multi-component habitation and cemetery site dating to around AD 1300/25-1400/25 (Esarey and Conrad 1998; Silva et al. 2014). The site is located on the western bluff line of the Illinois River Valley in Fulton County, Illinois (Esarey and Santure 1990a; Harn 1990; King 1990). The complex is located in a physiographical diverse area, with access to a variety of aquatic, forest, and prairie resources (King 1990), although it appears the residents relied heavily on cultigens (Santure 1990e). In addition to Bold Counselor phase Oneota materials, both Woodland and Spoon River Mississippian components have also been found at the site (Santure 1990a,d,e). The Bold Counselor phase Oneota component is about four hectares and is located in the southeastern portion of the site (Santure 1990a).

The Morton site (11F2) and neighboring mounds were first recorded by the University of Chicago in 1930s during field schools (Esarey and Santure 1990a; Harn 1990). In 1934, Illinois Route 78/97 cut through the bluff and destroyed portions of mounds and prehistoric villages, as well as burials (Esarey and Santure 1990a). Additional portions of Morton village were identified in 1983 during a Phase I survey conducted by the University of Illinois Resource Investigation program, which was prompted by the plan to improve Route 78/97 (Esarey and Santure 1990a; Harn 1990). During the survey, pottery sherds and a few human bones were discovered and additional investigations were recommended (Esarey and Santure 1990a). The following year a Phase II investigation was conducted by the Illinois Department of Transportation to assess the

impact of Route 78/97 (Harn 1990). The results of the investigation demonstrated that the site and associated cemetery, Norris Farms 36 (11F2167), could not be avoided. The resulting Phase III excavation was conducted in 1984 and 1985 by the Dickson Mounds Museum under the direction of Alan D. Harn and Sharron K. Santure (Harn 1990). Due to the possibility of looters and further destruction of the cemetery site, the cemetery was completely excavated, even though only a portion was impacted by Route 78/97 (Harn 1990).

During the 1984 and 1985 excavations of Morton village, a section of a burned hose and additional pit features were encountered (Santure 1990a). The house was semi-subterranean with artifacts in situ on the house floor (Santure 1990a). Human remains were primarily encountered during the 1984 and 1985 excavations in response to the construction of a highway that would impact the site. Excavation areas were long and narrow along the already existing Route 78/97 highway. These excavations exposed a small area of the village site, demonstrating Late Woodland, Oneota, and Middle Mississippian features and structures (Esarey and Santure 1990a:8). An additional excavation area on a nearby bluff uncovered a burned Mississippian structure and demonstrated Middle Mississippian and Early Woodland features. Finally, the cemetery portion of the site was defined and completely excavated, even the portions that would not have been affected by the project (Esarey and Santure 1990a:8,10). In 1986, restoration of the area resulted in exposure of multiple Oneota structures and features, with excavations of these areas taking place in 1988.

Because the excavations were conducted as part of a salvage project for the Norris Farms 36 cemetery, only limited portions of the associated Morton Village were excavated (Bengston and O'Gorman 2017b). Morton Village has since been the subject of more extensive excavations by Jodie O'Gorman (Michigan State University) and Michael Conner (Illinois State Museum,

Dickson Mounds Museum) beginning in 2008. Geophysical surveys and excavations have demonstrated the presence of at least 150 domestic structures, some of which appear to have been abandoned and then burned (Bengston and O'Gorman 2017b). Excavations have demonstrated structures and material culture that can be attributed to both Mississippian and Oneota peoples, as well as hybrids of the two archaeological cultures, such as that seen in structures and material culture (Tubbs et al. 2015). Recent research has focused on the organization of the site, diet, and how the Oneota adapted to and interacted with their environment and Mississippian traditions (Lieto and O'Gorman 2014; O'Gorman and Conner 2015; Tubbs et al. 2015; Yann et al. 2015; Bengston and O'Gorman 2016, 2017a,b).

The cemetery site of Norris Farms 36 is in the Central Illinois River Valley in Fulton County, Illinois. The proximity of the cemetery to Morton Village, as well as similar ceramic assemblages, suggest an association between the two sites (Santure 1990a). New radiocarbon dates suggest that the cemetery was occupied during the earlier period of Morton Village's occupation (Silva et al. 2014). The Norris Farms 36 cemetery and corresponding Morton Village site are the most well documented sites attributed to the Bold Counselor phase (Esarey and Conrad 1998) and contain the largest collection of Oneota skeletal material (O'Gorman 1996). The cemetery is located on an accretional mound on a bluff edge overlooking the river valley (Santure 1990b) and appears to be primarily Oneota, although there is a presence of both Oneota and Late Mississippian artifacts within interments (Santure et al. 1990; Esarey and Conrad 1998). Nine hearths were found among the graves, which may relate to the historic Winnebago, Chippewa, Kansa, Oto, and Missouri practice of burning a fire at a grave to aid the spirit into the afterlife (Santure 1990b). Generally, the graves were dug to fit an extended burial, although "five individuals (Burials 13, 96,160, 190, 219) were interred in pits excavated into the floor of larger

graves" (Santure 1990b:69). As there is little evidence of disturbance to the graves, they likely were visible or their locations were known (Santure 1990b). "Most graves were aligned parallel to the ridge top" with their heads oriented north (Santure 1990b:69). Graves were tightly packed, suggesting there was an effort to constrain the cemetery area (Santure 1990b).

Human Remains

The cemetery population of Norris Farms 36 consists of 264 individuals: 112 adults, ten adolescents, and 142 children (Santure 1990b,c). The mortality distribution is reflective of a typical population, with about half of the death population under 15 and many living beyond 50 years (Milner and Smith 1990). Most of the skeletons (95%) were articulated, and of these, 216 were supine, seven were prone, and three were buried on their side (Santure 1990b). There were also bundle burials consisting of "long bones, skulls, and pelvic elements, although some ribs and vertebrae occasionally were present" (Santure 1990b:71). It is believed that most individuals were placed in open graves that were covered by a pole roof, then filled with sediment (Santure 1990b).

As can be seen in **Figure 8**, a pattern of graves is present, with familial associations located within the inner portion of the cemetery, while those with traumatic death are more often on the perimeter (Santure 1990b). Mortuary artifacts within burials included ceramic vessels; shell spoons/bowls; arrowpoints; knives and scrapers; fishing, digging, and weaving tools; pendants, gorgets, pins, and beads; and ceremonial equipment (Santure 1990a). Generally, pottery was widespread within the cemetery, marine shell items were more centrally located and most often found with children (Santure 1990a). "Artifacts reflective of daily tasks (weapons, lithic reduction tools, fabricating and processing tools, and raw materials) were almost

exclusively associated with males" (Santure 1990a:110), and it is likely that other grave goods, especially those associated with females, may have been biodegradable. According to Santure (1990a), the burial patterns found at Norris Farms 36 are similar to those seen at Spoon River Mississippian sites, suggesting some commonality between the cultures. Bengston and O'Gorman (2016) re-examined patterning in the distribution of grave goods interred within graves at the Norris Farms 36 Cemetery. They found that generally the grave good were typical of Oneota; however, that Mississippian-style artifacts were associated with children. A subset of these artifacts displayed bird and hand symbolism, which is attributed to Mississippian societies (Bengston and O'Gorman 2016). This highlights the importance of children in aiding in the negotiation and mediation between Oneota and Mississippian residents at Morton Village.

Figure 8: Distribution of Individuals with Evidence of Violence (Black Shading) at the Norris Farms 36 Cemetery (Santure 1990c:157)

At least 43 individuals show evidence of traumatic death (Milner and Smith 1990). Evidence of violence includes embedded projectile points, unhealed fractures, and evidence of decapitation or scalping (Milner and Smith 1990; Santure 1990c). These individuals were

typically buried in the peripheral areas of the cemetery with fewer grave inclusions and sometimes found in prone or flexed positions (Santure 1990c). Eleven individuals were decapitated and fourteen individuals were scalped (Milner and Smith 1990). An additional three individuals, all female, showed evidence of scalping but apparently survived (Milner and Smith 1990). Six individuals had projectile point injuries and ten had blunt force trauma to the cranium (Milner and Smith 1990). Dismemberment was also seen in at least eight individuals (Milner and Smith 1990). Another 30 individuals were damaged by scavengers and sun bleaching, and most of these individuals had evidence of trauma (Milner and Smith 1990). This patterning is suggestive of small groups subjected to raiding or attack while away from the settlement (Milner and Smith 1990). Although it has been suggested that women were more likely the victims of violence, Bengston and O'Gorman (2017b:241) used "osteological, subsistence, and mortuary data to suggest that Morton Village women may have regularly and actively participated in violent encounters as part of their engagement with the broader socio-politics of the region *without* being formally celebrated as warrior in their mortuary disposition." Although not all trauma to females can be interpreted as women warriors, Bengston and O'Gorman (2017b) suggest that at least some Morton Village women did participate.

Primary, secondary, and tertiary human remains were recovered from the Morton Village and Norris Farms 36 sites (**Table 4**). There were also post-interment additions of skeletal elements; all but one was with an original inhumation exhibiting trauma (Santure 1990b). The fragmented remains recovered from the Morton Village site included infant remains, teeth, and long bone and cranial fragments found within non-burial features (Michael Conner, personal communication, 2017). Although not explicitly discussed in any chapters, an appendix lists tabulations of artifacts found in features at both Norris Farms 36 and Morton Village (Santure et

al. 1990). In some of these, human bone was listed. These were included in the tabulations although their context and whether they were intentionally modified is not known.

Table 4: Cultural Modification of Human Remains from the Morton Village and Norris Farms 36 Cemetery Sites

	Primary	Secondary	Tertiary	Multiple	Post-Interment Addition	Unknown	Total
None	203	1	16	10	2	5	**237**
Scalping/ Perimortem Trauma	19	5	0	10	9	1	**44**
Burning	0	1	0	0	0	0	**1**
Total	**222**	**7**	**16**	**20**	**11**	**6**	**282**

Milner and Smith (1990); Santure et al. (1990); Conner (personal communication, 2017)

There were also several instances of burials with multiple individuals, many of which exhibited trauma. A decapitated female (Burial 38) was found within a grave of another female (Burial 46); a bundle burial of a female with perimortem fractures to the left forearm (Burial 139) was found with a child (Burial 150); a bundle burial of a male (Burial 244) and portions of two others (Burials 244B and 243B) were found with another male (Burial 243); a scalped and partially disarticulated female (Burial 200) was found with a male (Burial 206); and a decapitated and partially disarticulated female (Burial 252) was prone with another female with traumatic injuries (Burial 255) (Santure 1990b).

Summary

Excavations at Morton Village and Norris Farms 36 have been wide-spread. Highway expansions prompted the first large-scale excavations at the site, leading to the discovery of the magnitude and size of the village, as well as the complete excavation of a separate cemetery located on a nearby bluff. Excavations during 1984 identified areas of the nearby village site and the complete boundaries of cemetery site. The cemetery was completely removed in 1985 to

prevent looting or further destruction. During excavations occurring between 1986 and 1988, a much clearer boundary of Morton Village was identified when restoration of the construction area began, essentially doubling the number of features previously recorded. Although excavations are still ongoing by Michigan State University and Dickson Mounds Museum, geophysical survey has led to the discovery of more structures at the site, as well as a more defined site boundary. Tertiary human remains are occasionally been encountered within features at the Morton Village site.

5.1.2 Iowa

Three sites within Iowa are used for this research: Howard Goodhue (13PK1) in central Iowa and McKinney (13LA1) and Wever (13LE110) in southeast Iowa. In accordance with Iowa burial laws, all human remains have been repatriated and reburied. A few specimens were in the process of repatriation during data collection. These remains were examined by the author and found to be consistent with previously collected data. Therefore, all data were previously collected and recorded by the University of Iowa Office of the State Archaeologist Bioarchaeology Program (formerly Burials Program).

Within Iowa, multiple phases of Oneota have been identified, including the Correctionville phase (AD 1300-1500) in northwest Iowa, the Orr phase (AD1650-1690) in northeast Iowa along the Upper Iowa River, the Burlington phase (AD 1300) in southeast Iowa along the Mississippi River, and the Moingona phase (AD 1100-1400) in central Iowa near the Des Moines River (Harvey 1979; Henning 1995; Betts 1998; Alex 2000; Hall 2007). In southeastern Iowa, Oneota sites are generally small, unfortified villages and often have multiple reoccupations situated on the floodplain of the Mississippi River Valley (Tiffany 1998). Burials

have also been encountered at Oneota sites in southeastern Iowa, as well as human remains found in storage pits and village middens (Tiffany 1998).

5.1.2.1 The Howard Goodhue Site (13PK1)

The Howard Goodhue site is in Polk County in central Iowa, on a geomorphological terrace formed by the Des Moines and North Rivers (Gradwohl 1973; Hall 2007). Specifically, the site is on a former oxbow of the Des Moines River (Lillie 1996a). The site dates to approximately AD 1150 based on charcoal radiocarbon dates (De Vore 1990) and is attributed to the Moingona phase during the Developmental horizon (Alex 2000; Gradwohl 1974). The Moingona phase is believed to show the earliest evidence of the Oneota in Iowa (Moffat 1998).

Although Wheeler (1949) had earlier reported archaeological sites in the Des Moines River Valley, archaeological work in this area was prompted by the construction of a dam to create Red Rock Reservoir (Gradwohl 1973). A survey of the area conducted in 1961 by the University of Iowa Office of the State Archaeologist by McKusick and Ries (1962) identified several sites, including 13PK1, for archaeological excavation and salvage (Gradwohl 1973, 1974). Excavations and surface finds identified additional sites in the region, as well as Oneota material culture at 13PK1, such as shell-tempered ceramics, triangular projectile points, knife fragments, and scrapers (Gradwohl 1973).

At 13PK1, exploratory testing was conducted by Iowa State University in 1965, followed by two field schools: in 1965 under Robert D. Grant and in 1966 under David M. Gradwohl (Gradwohl 1973). In 1965, multiple basins, depressions, and refuse-filled pits were discovered, as well as post holes (**Figure 9**). In 1966, an additional 27 features were discovered, most of which were refuse-filled storage pits, although others contained vegetal remains or served as

caches (Gradwohl 1973, 1974).

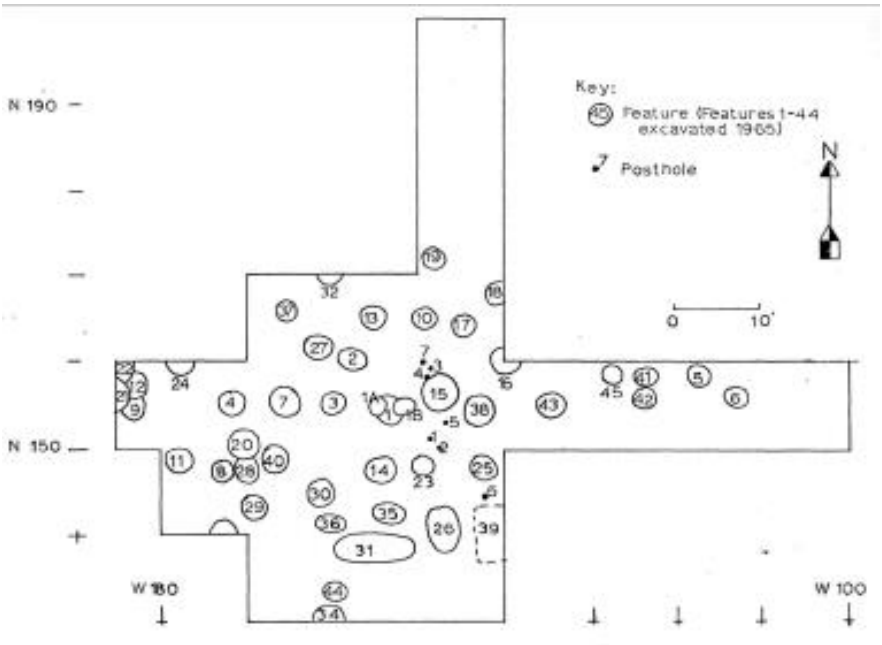

Figure 9: 1965 Excavations at the Howard Goodhue Site (Gradwohl 1973:18)

Ceramic artifacts included jars, rim and body sherds, handles, bowls, effigies, beads, baked clay balls, and pipe fragments (Gradwohl 1973). Chipped stone materials included projectile points, end scrapers, side scrapers, retouched flakes, bifacial flakes, drills, gravers, and utilized flakes (Gradwohl 1973). Bone artifacts included awls, needles, fishhooks, fleshers, scoops, points, picks, beads, and pendants (Gradwohl 1973). Shell artifacts included spoons, found in feature fill, and perforated shells, effigies, and beads (Gradwohl 1973). Copper was also found, including a sheet copper fragment on the site surface and cylindrical beads within burials (Gradwohl 1973). Daub and wattling clay were also found, including some that contained impressions of materials and human hand prints (Gradwohl 1973). Stone tools included abrading tools, grinding stones, hammerstones, pipes, ground and unworked hematite and limonite, and worked galena (Gradwohl 1973). A majority of the stone artifacts were from "outcrops of the Upper Mississippian St. Louis formation in the Pella locality" (Gradwohl 1974:95-96). The

Oneota at the Howard Goodhue site practiced a variable diet, as faunal remains from the site include “deer, elk, bison, squirrel, gopher, mouse, muskrat, beaver, bear (?), canid, raccoon, skunk, human, bird, turtle and fish” (Gradwohl 1973:82; Hall 2007). Some of these animal bones had been worked and modified. Vegetal remains included wood charcoal, corn, seeds, fruit pits, a nut shell, and grass, which demonstrate evidence of collecting these resources (Gradwohl 1973, 1974). Late nineteenth and early twentieth century historic artifacts were also found scattered on the site surface (Gradwohl 1973).

A structure made up of “an arc of 50 postholes” of approximately 15 to 18 meters in diameter was encountered. Enclosed within the structure were primary and secondary human burials (Gradwohl 1973:17, 1974; Lillie 1996a; Hall 2007). Burials were located near postmolds (Lillie 1996a) and are assumed to be within the structure, thought to be a mortuary enclosure by Gradwohl (1973) based on the curved arrangement of the postholes (**Figure 10**).

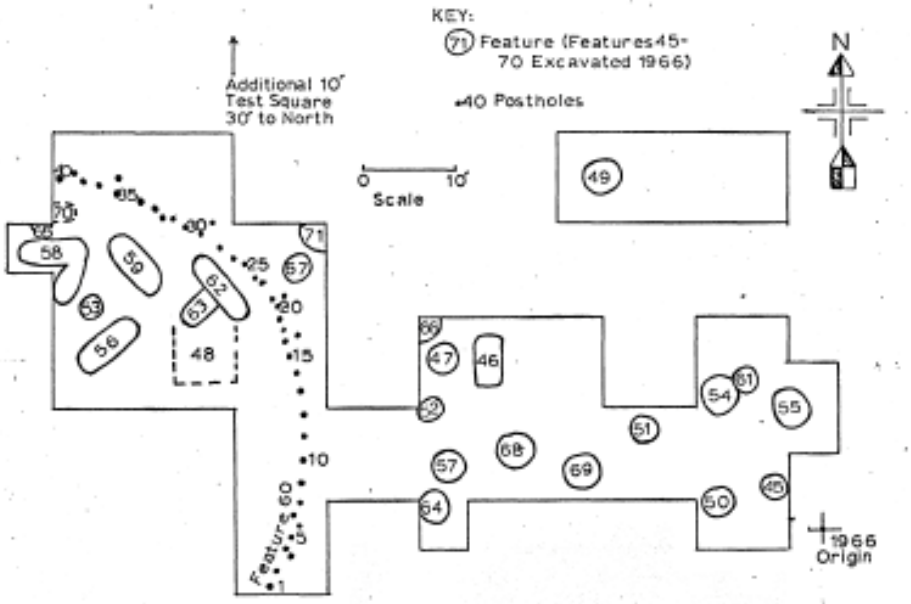

Figure 10: 1966 Excavations at the Howard Goodhue Site (Gradwohl 1973:19)

All features within the enclosure are primary and secondary burials except for one depression filled with charcoal, burned earth, and cultural trash that may represent something

other than a storage or trash pit (Gradwohl 1973). The area of the enclosure or structure was only partially excavated, but all features located within this area contained burials. Additional human remains were also found in three non-burial features outside of the structure, as well as in cultural midden and surface deposits (Gradwohl 1973). Some of the scatter may be attributed to burial disturbance or other secondary burial practices (Gradwohl 1973).

Human Remains

Both primary and secondary human burials were found at the Howard Goodhue site, as well as tertiary remains found in non-burial feature (**Table 5**). Gradwohl (1973) notes additional human remain fragments found in midden or storage pits; however, many of these remains were not found or identified upon analysis and are thus not included in any individual counts (Lillie 1996a).

Table 5: Cultural Modification of Human Remains from the Howard Goodhue Site

	Primary	Secondary	Tertiary	Total
None	5	14	6	**25**
Cutmarks	0	0	1	**1**
Burning	0	0	1	**1**
Total	**5**	**14**	**8**	**27**

Gradwohl (1973); Lillie and Schermer (2015b)

Some tertiary human remains at the Howard Goodhue site also included additional modifications, including cutmarks and burning (**Table 6**). These were found in non-burial features at the site.

Table 6: Human Remains with Additional Cultural Modifications from the Howard Goodhue Site

Feature	Context	Age	Sex	Elements	Cultural Modification
Feature 24	"storage pit"[1], "cache pit" [2]	20-50	indeterminate	left parietal fragment	6 cutmarks
Feature 17	"refuse-filled basin" [1], "cache pit" [2]	adult	indeterminate	4 cranial fragments	burned

[1]Gradwohl (1973); [2] Lillie and Schermer (2015b)

The tertiary remains include a left parietal fragment from a storage pit, Feature 24 (Lille 2002a). Feature 24 was identified as a storage pit that contained cultural material such as pottery sherds, stone, shell, flakes, awl, and a fragment of a ceramic effigy (Gradwohl 1973; Lillie 2002a). Some polishing is present on the cranial fragment; however, it appears to be the result of natural taphonomic processes. There are also six small cutmarks on the posterior margin of the bone (Lille 2002a). Feature 17 produced four burned cranial fragments (Lillie 2014). Feature 17 is a refuse pit filled with cultural refuse, such as bone, shell, pottery sherds, lithics, and burned earth (Gradwohl 1973; Lillie 2014). The fragments all have evidence of burning along the broken margins, suggesting they were broken before or during burning (Lillie 2014).

Summary

Survey of the Des Moines River Valley led to the discovery of multiple sites, including Howard Goodhue. Field school operations excavated limited portions of the site, and thus, exact site area and structure is still unknown (**Figure 11**). 1965 excavations produced multiple pit features and postholes, although no structures were identified. Excavations the following year produced additional features, as well as a curved line of postholes. Within the partially excavated curved structure were the human burials and other pit features containing human remains. No additional excavations have occurred at Howard Goodhue since, and thus, the size and structure of the village is still unknown.

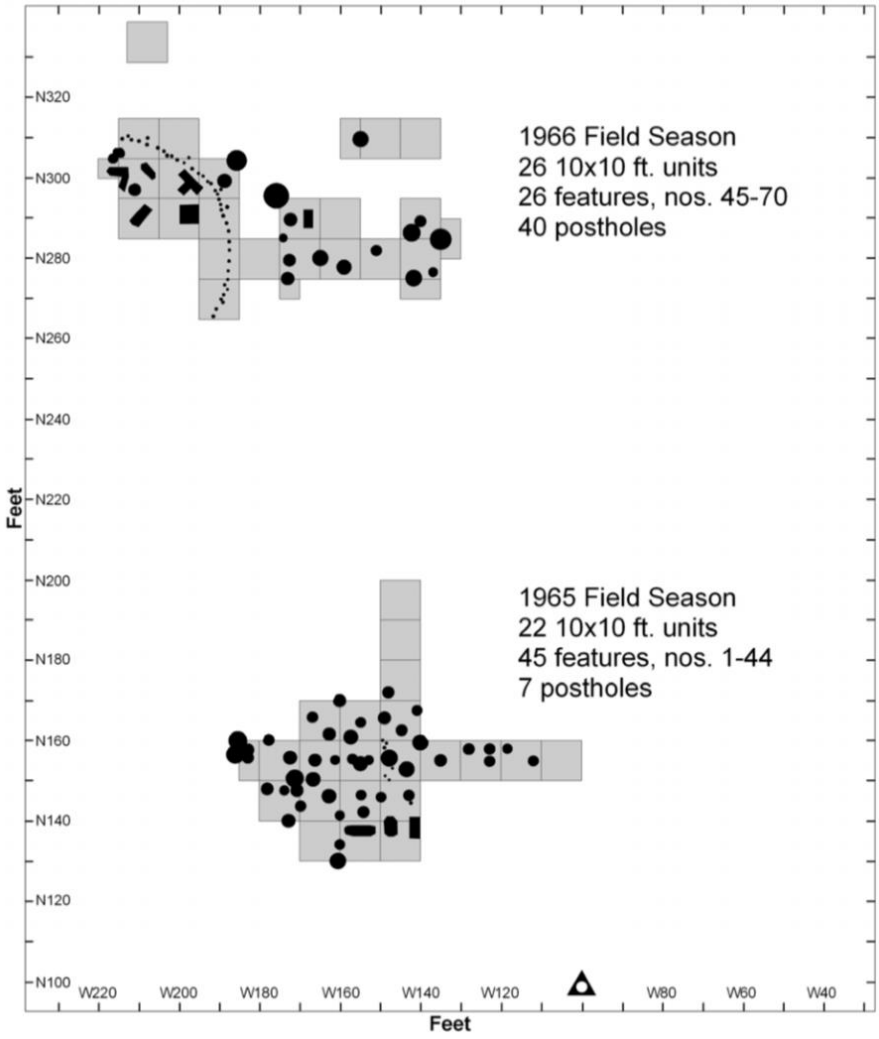

Figure 11: 1965 and 1966 Excavations at the Howard Goodhue Site (Hall 2007:12)

5.2.2.2 The McKinney Site (13LA1)

The McKinney Oneota Village (13LA1) is located in Louisa County in southeastern Iowa (Slattery et al. 1975). The site has been attributed to the Orr focus based on similarities in ceramics. McKinney is a Classic horizon Oneota site with no evidence of Euro-American contact and excavations have yielded radiocarbon dates that range between AD 1500 and 1650 (Hollinger 2005). The site "occupies a high clay loam terrace" (Slattery et al. 1975:40) above the Iowa and Mississippi Rivers (Slattery et al. 1975; Slattery 1979) and is located on the Southern Iowa Drift Plain made up of "the prehistoric glacial Lake Calvin" (Slattery 1979). It is part of the

Prairie Peninsula, an area of grasslands and patches of hickory and oak (Slattery 1979). This site is in a prairie-forest ecotone, and provided diverse opportunity for food resources, including fish and mussels from the Iowa and Mississippi Rivers, mammals and birds in the marshes, and buffalo in the uplands (Slattery 1979; Tiffany 1988). Firewood and timber could be found in the nearby forested areas and the rivers could serve as routes of transportation (Slattery 1979).

The site contains "an octagonal earthen "fortification" and, nearby, eight conical mounds" (Slattery et al. 1975:37). The mounds are Hopewellian in origin and have no cultural relationship to the village (Slattery et al. 1975). The first account of the site comes from John Newhall (1841) who, from the view of the Toolesboro mounds, saw an octagonal defensive embankment enclosing an abandoned village of about five to six acres (Slattery et al. 1975). Within the fortification, Newhall (1841) found cultural materials, such as flint, urns, and pottery with diamond impressions. William L. Toole (1868) described a similar embankment, making a fort (Slattery et al. 1975). Later, W. H. Pratt (1875) referenced the McKinney site as located "a quarter mile northwest" [about 402 meters] of the mounds (Slattery et al. 1975:39). He also notes triangular points, end scrapers, and shell-tempered pottery, all of which are attributed to cultural material associated with Oneota (Slattery et al. 1975). Pratt (1875) also described an eroded earthwork that would have stood about two feet [60.96 cm] high that encloses a fort (Tiffany 1988). Shaw (1877) and Stevenson (1879) also encountered similar embankments that enclose a site filled with broken pottery and flint (Tiffany 1988). Although no evidence of a fortification was found during the 1979 excavations (Tiffany and Slattery 1980), LiDAR later confirmed the presence of a horseshoe-shaped enclosure like that described by Stevenson (1879) (Riley 2012).

The first archaeological excavations were performed by Richard G. Slattery and George A. Horton in 1970 to determine whether the site was a village site and compare it with other

known Oneota sites (Slattery et al. 1975). The 1970 test excavations recorded features that were identified either as fire pits or hearths (Slattery et al. 1975) that were in an intensely occupied area (Slattery 1980). Slattery et al. (1975) hypothesize that these features were used for in-place fires and were then filled with refuse once no longer in use. Pottery from the 1970 test excavations at McKinney were similar to Allamakee Trailed (Slattery et al. 1975; Tiffany 1988). Additional excavations were conducted in 1975 by Catherine Goodman Sammis and Richard G. Slattery to obtain micro-mammal material from storage pits (Slattery 1979). The 1975 excavations revealed three cylindrical pits typical of Oneota (Slattery 1979). There is evidence of burning within these features, with unburned bone mixed in with the ash indicating it was added after the fire cooled (Slattery 1979). A fragmentary human mandible was also encountered in one of the pits (Slattery 1979).

In 1979, an Iowa Archaeological Society field school was conducted at the McKinney Oneota village site (Tiffany and Slattery 1980). The field school documented that the site was largely undisturbed and had no evidence of historic contact. However, the site had a small, earlier Woodland component, and a long-term occupation by Oneota (Tiffany and Slattery 1980). The 1979 excavations were in an area with minimal midden deposition and few fire hearths but many storage pits that were used and filled in (Slattery 1980). In 1980, the Iowa Archaeological Society conducted another field school at the McKinney site, uncovering more storage pits (Slattery and Tiffany 1981). Further excavations at the site were conducted by the University of Illinois-Urbana and the Iowa Archaeological Society in 1995 and 1996 to better understand a Classic horizon site that had little to no interaction with Euro-Americans (Hollinger 2005; Lillie 1996b).

The site was deemed to cover a large area that was intensively occupied the Oneota year-round. Feature clusters suggest that there were most likely large longhouse structures within the village (Hollinger 2005:90). During the excavations of McKinney, clusters of storage pits of various sizes were encountered believed to have been originally used for storage of agricultural foods or personal possessions, then were later filled with refuse (Tiffany 1988). Four main shapes of storage pits were noticed: "(1) wide and shallow, (2) as deep as wide, (3) deeper than wide, and (4) bell shaped" (Tiffany 1988:261). As many of the bell-shaped pits were open to the plowzone, it is concluded that the site was more heavily occupied during the late Oneota occupation, as bell-shaped pits appear later in southeastern Iowa (Tiffany 1988). The ceramics assemblage contains bowls, pots, and large and small jars and are tempered with crushed shell (Tiffany 1988). The ceramics are broadly classified as Allamakee Trailed pottery, with local Burlington and Kelley phase components (Tiffany 1988).

Human Remains

Archaeological investigations at the McKinney site have uncovered multiple burials and isolated human remains. Although primary burials have been identified within houses and features, the human remains were mapped in situ and not removed from the site (Hollinger 2005). The remains of a maximum of 33 individuals have been identified from the site, mostly from pit features and disturbed contexts (Fokken 1979; Young 1981a, 1981b; Lillie 1999b, 2002b). Many isolated human remains were recovered from non-burial feature contexts, including cranial, long bone, and vertebral fragments, as well as dental remains.

Some of the human remains recovered have also been culturally modified, including burning, polishing, and cutmarks (**Figure 12**). During the 1975 excavations, two parietal

fragments most likely from one individual were found within the plowzone. Each had been polished (Fokken 1979). One of these fragments also contained seven parallel cutmarks caused by a "doubled edge tool" that created a "dual trail in each incision" (Fokkens 1979:1). The other parietal fragment showed "abrasive micro-striations near the coronal suture" (Fokkens 1979:1).

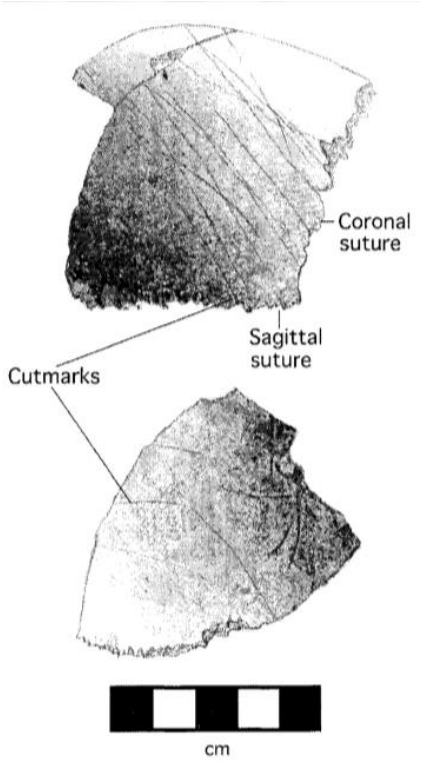

Figure 12: Modified Cranial Remains from the Plowzone above Feature 2 at the McKinney Site (Hollinger 2005:99)

The 1980 excavations at McKinney also produced culturally modified human remains. One parietal fragment from an older juvenile to young adult found in square 77 was polished and possibly burned. In the same and neighboring units, a non-burial feature, Feature 62, produced a left femur from an adult male, a right femur, two skull fragments from an older juvenile to young adult, and a mandible from a 20- to 30-year-old female (Young 1981a).

The excavations from 1995 also produced human remains with cultural modification (Lillie 1996b). One juvenile or adult parietal fragment was found in the plowzone. The

ectocranial surface was polished, after which the fragment was burned, followed by incising. The incising was made up of 17 cutmarks that "formed a crosshatch pattern" (Lillie 1996b:154). Another non-burial feature, Feature 102, also produced a fragment containing part of the frontal and parietal bones from a juvenile, aged 10-14 years. The fragment was burned with 18 cutmarks on the ectocranial surface on the frontal portion, oriented mediolaterally (**Figure 13**).

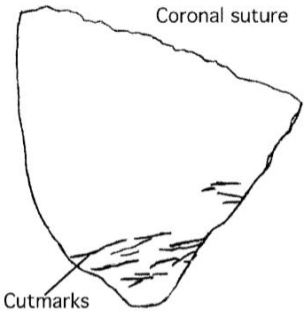

Figure 13: Cutmarks Attributed to Scalping from Feature 102 at the McKinney Site (Hollinger 2005:100)

The same feature also contained large amounts of charcoal and ash and animal remains, "including turtle, fish, deer, dog, raccoon, beaver, and shellfish" (Lillie 199b:154). Additional excavations in 1996 produced multiple culturally modified cranial fragments (Lillie 2002b (**Figure 14**).

Only tertiary remains were recovered during excavations at the McKinney site (**Table 7**). The presence of primary burials at the site was a requirement for inclusion in this dissertation research; however, due to Iowa burial laws, many primary burials are not excavated, unless necessary. Thus, exceptions were made for sites in Iowa, specifically for the McKinney site, as contextual data and maps were also present.

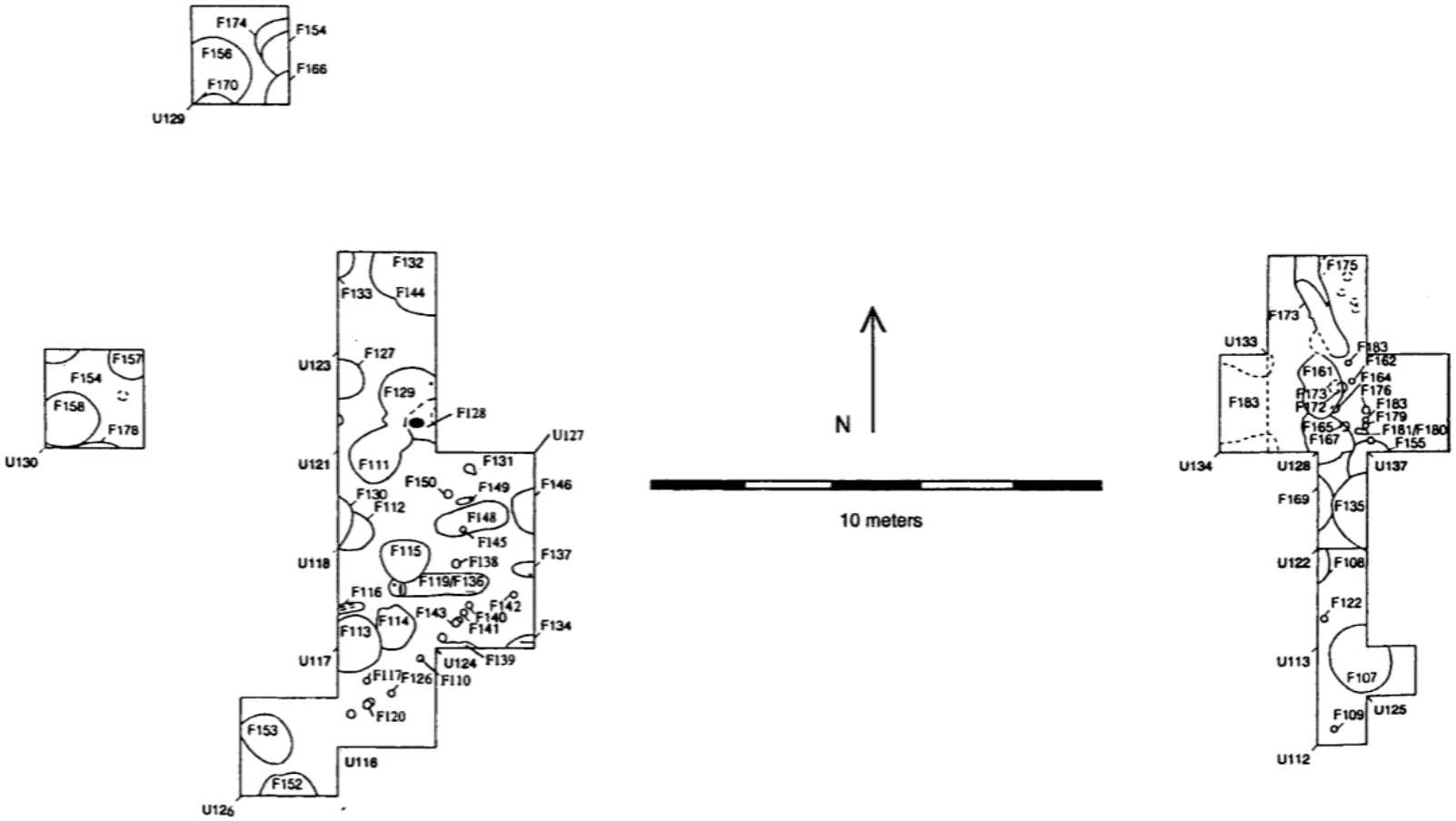

Figure 14: 1996 Excavations at the McKinney Site (Hollinger 2005)

Table 7: Cultural Modification of Human Remains from the McKinney Site

	Tertiary	Total
None	12	**12**
Scalping	1	**1**
Burning	1	**1**
Polish	1	**1**
Multiple Modifications	5	**5**
Total	**20**	**20**

Fokken (1979); Young (1981a, 1981b); Lillie (1999b, 2002b)

Of the tertiary remains recovered, cutmarks and polishing were the most prevalent. Multiple fragments of human remains were found in Feature 123, which was a "deep bell-shaped" storage pit that was "later filled with refuse" (Lille 2002b:59). The pit contained charred grass matting and faunal remains. Human remains consisted of an incomplete mandible and a parietal fragment that was heavily burned, with endocranial polishing and six cutmarks on the ectocranial surface mostly oriented anteroposteriorly (**Table 8**).

Table 8: Human Remains with Additional Cultural Modifications from the McKinney Site

Context	Age	Sex	Elements	Cultural Modification
Plowzone, above Feature 2	23-40	indeterminate	2 parietal fragments	both polished, one with 7 cutmarks
Unit 77	15-35	indeterminate	right parietal fragment	polished, possibly burned
Feature 102	10-14	indeterminate	frontal/parietal fragment	18 cutmarks on frontal (scalping)
Feature 132/144	20-35	indeterminate	15 cranial fragments (parietal, occipital, vault)	occipital: burned 34 cutmarks; 14 charred burned cranial fragments (5 refits)
Plowzone, Unit 95	adult	indeterminate	parietal fragment	burned, polished, 17 crosshatched cutmarks
Feature 123	adult	indeterminate	parietal fragment	heavily burned, polished, 6 cutmarks

Fokken (1979); Young (1981a); Lillie (1999b, 2002b)

Within Unit 123, many fragmented human remains were uncovered, most of which were associated with Feature 132/144 (Lillie 2002b). These features were originally thought to be separate; however, they were later determined to be "different depositional zones of the same feature" (Lillie 2002b:59). Within the general unit, a thoracic vertebra from a young adult and five burned cranial fragments (two parietals, two vault, and one occipital) from an adult were

found. The occipital fragment contained the occipital protuberance and displayed 34 cutmarks on the ectocranial surface (**Figure 15**).

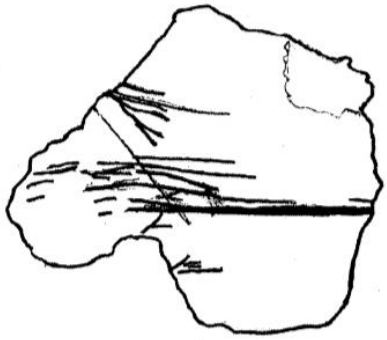

Figure 15: Modified Cranial Fragments from Feature 132/144 at the McKinney Site (Hollinger 2005)

The feature was probably a roasting pit that was later filled with refuse (Lillie 2002b). The cutmarks appear to have occurred after the burning and may have extended to neighboring bone. Within Feature 132/144, ten cranial fragments, as well as a metatarsal were uncovered. Of the ten fragments, five were refitted (Lillie 2002b:60).

Summary

Excavations of the McKinney site in 1970 and 1975 uncovered a portion of the village site that was intensively occupied by Oneota. Field schools in 1979 and 1980 also uncovered multiple features. However, the exact size and structure of the site are unknown. Isolated human remains were encountered during multiple excavation seasons. As no burials or mortuary areas were discovered, their meaning and relationship to the mortuary program is still unknown.

5.2.2.3 The Wever Site (13LE110)

The Wever site is located on a river terrace on the Skunk River in Lee County, Iowa, near

the town of Wever (Halloran 1995). The site has been estimated to be 8.7 acres at minimum (Withrow and Chadderdon 2001). It has been classified as a Developmental horizon site, dating between AD 1250-1350 (Hollinger 2005). The Wever site is classified as a Burlington phase Oneota site, which succeeded the Moingona phase of central Iowa (Hollinger and Vradenburg 2004; Hollinger 2005). The Wever Terrace locality was heavily occupied by the prehistoric Oneota (Withrow and Benn 2004).

The Wever site was first identified as a large habitation site in 1977 and 1978 based on surface surveys (Withrow and Chadderdon 2001; Withrow and Benn 2004). Phase II excavations took place in 1984 and 1985 and focused on areas that were within a proposed highway construction area (Finney 1991; Withrow and Benn 2004). Between 1992 and 1994 Phase III excavations of two archaeological sites, 13LE117 (Morrow) and 13LE110 were conducted by the Iowa Department of Transportation, while The Louis Berger Group wrote the excavation report (Withrow and Benn 2004). Evidence of other prehistoric inhabitants were also noted, including Early Archaic and Middle and Late Woodland (Withrow and Benn 2004). Excavations of the site occurred as part of the Wever Bypass Highway Project, in which most of the site (90 percent) was destroyed (Hollinger 2005). The project stripped most of the village and uncovered refuse/storage pits, postmolds, and burials. Excavations of the site were modified to exclude excavation of any burials (Hollinger 2005).

The latter excavation stripped an area that covered what is believed to be the majority of the village (Hollinger 20015:56). The exposed village resembled a horseshoe-like appearance with the “opening facing the bottomlands near the edge of the terrace” (Hollinger 2005:56). Clusters of pit features were believed to demarcate the location of houses, but any remnants of posts were believed to have been previously destroyed by plowing of the site (Hollinger

2005:56). An open area surrounded by clusters of pits was believed to be a communal area, while at the edge of this area there were several burials within a circular enclosed structure (Hollinger 2005:56). On the opposite side of the plaza, another area of burials, also likely enclosed in a structure, where also partially exposed (Hollinger 2005:56).

Floral and faunal remains from midden and refuse pit contexts included a variety of resources including fish, shellfish, waterfowl, deer, and elk, as well as a variety of nuts, berries, and wild rice (Hollinger 2005). The Oneota in this locality also cultivated plants including maize, squash, beans, and sunflower (Hollinger 2005). The range of floral and faunal remains suggests that the site was occupied year-round (Hollinger 2005).

Human Remains

Multiple burials were uncovered during the extensive excavations in 1992 and 1993, including burials at the village (13LE110) and a separate defined cemetery that was not excavated (13LE327) located north of the village (Hollinger and Vradenburg 2004). The Wever village site (13LE110) excavations discovered 38 burial features, although most were not excavated (Withrow and Chadderdon 2001; Hollinger and Vradenburg 2004; Withrow 2004) (**Figure 16**).

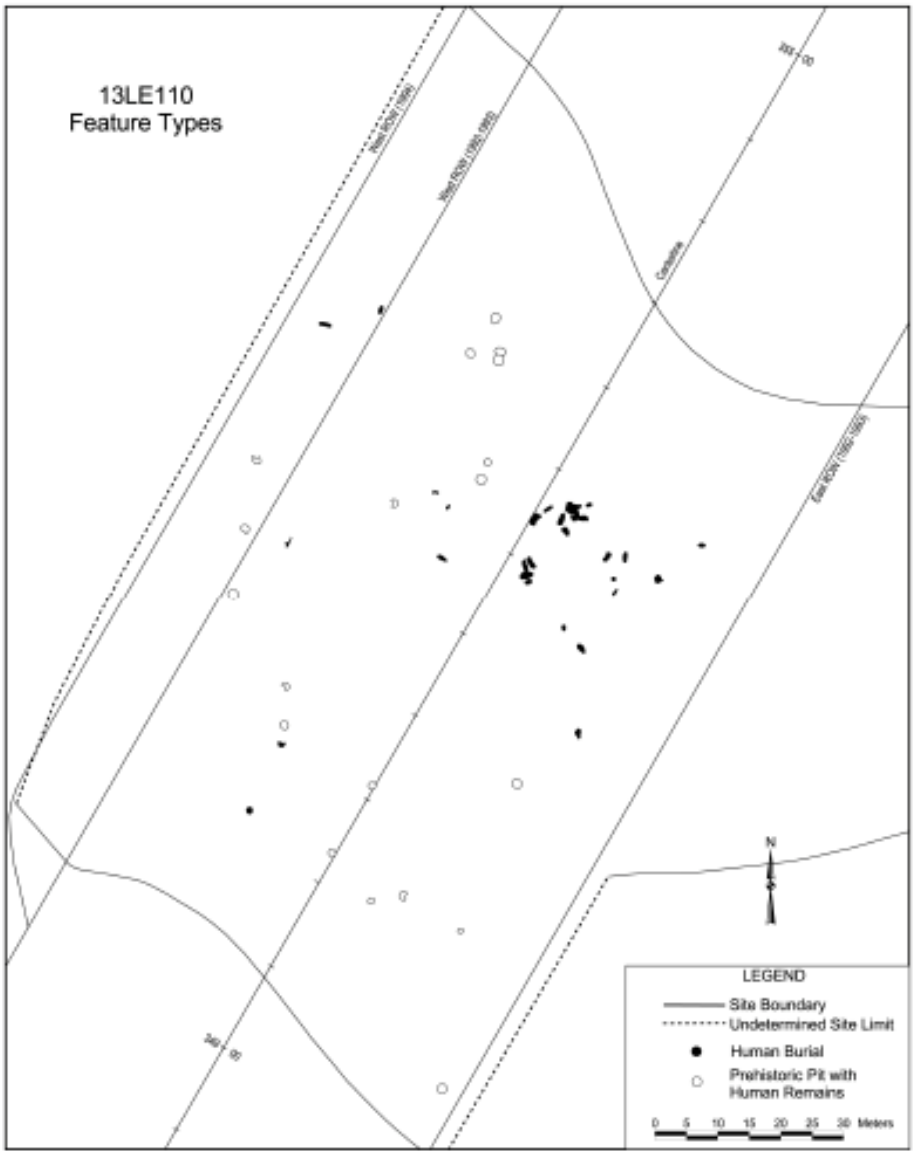

Figure 16: Burials and Features with Human Remains at the Wever Site (Withrow and Benn 2004:125)

The human burials were distributed within a semi-circular structure with central post that was located at the edge of a plaza (Withrow 2004; Hollinger 2005) (**Figure 17**). A second, similar structure was found with several more burials on the opposite side of the plaza, and a few additional burials were found within the village area (Hollinger 2005:56). Similar mortuary structures in which burials are placed within a defined area are seen at other Iowa Oneota sites, including Howard Goodhue (13PK1), and the nearby Morrow (13LE117) and Median

(13LE327) sites (Hollinger 2005). The Median site located north of the Wever site had 47 human burials and additional burial features. At this site, pit features clustered together and there was a separate area of human burials that appear to have been enclosed in a structure, similar to that seen at the Wever site (Hollinger 2005:56). However, burials at the Median site were only mapped in place and were not excavated, and thus are not discussed here. Hollinger (2005:57) proposes that the two burial areas suggest "family or clan cemeteries" that are marked by some type of post structure or fence. From these sites, it appears that the Oneota population in this locality chose to bury at least some of their dead in a dedicated mortuary space (Withrow 2004).

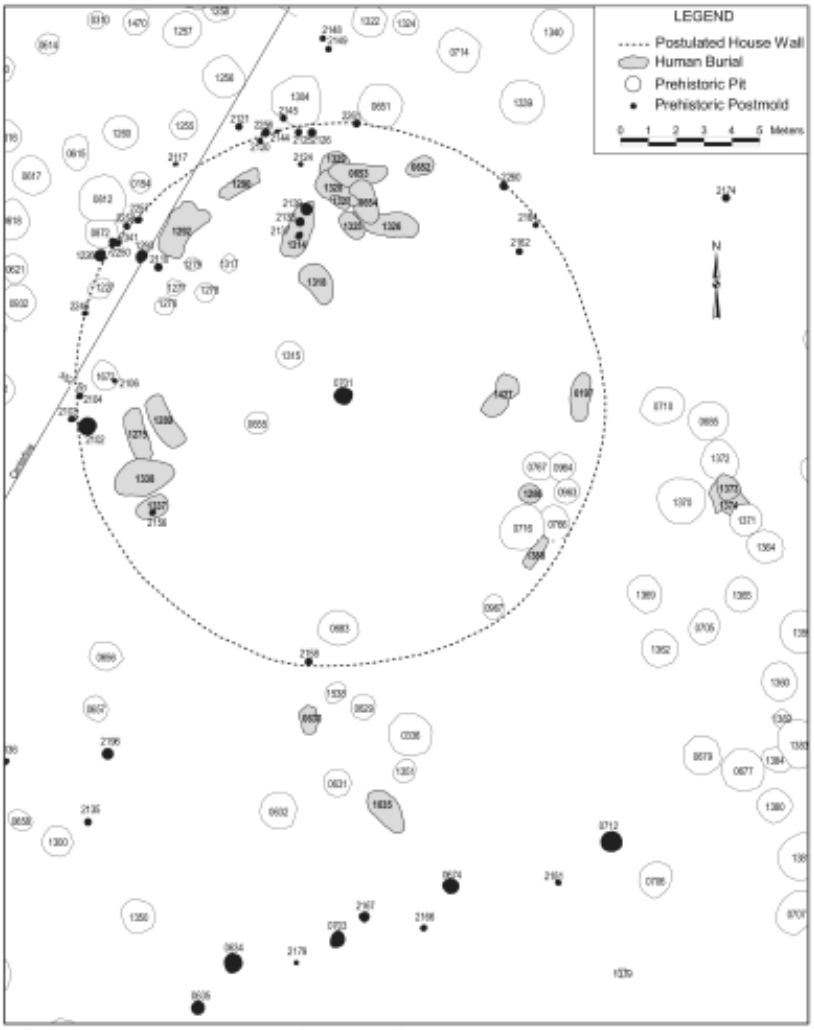

Figure 17: Proposed Mortuary Facility at the Wever Site (Withrow and Benn 2004:133)

Withrow (2004) also proposes a longhouse structure for the Wever site (**Figure 18**) and suggests that the longhouses would have been similar in size to those of the Tremaine site in Wisconsin. If the longhouse suggestion is correct, Burial Features 1924 and 1999 would have been located inside the house and oriented perpendicular to the walls, like that seen at Tremaine (Withrow 2004).

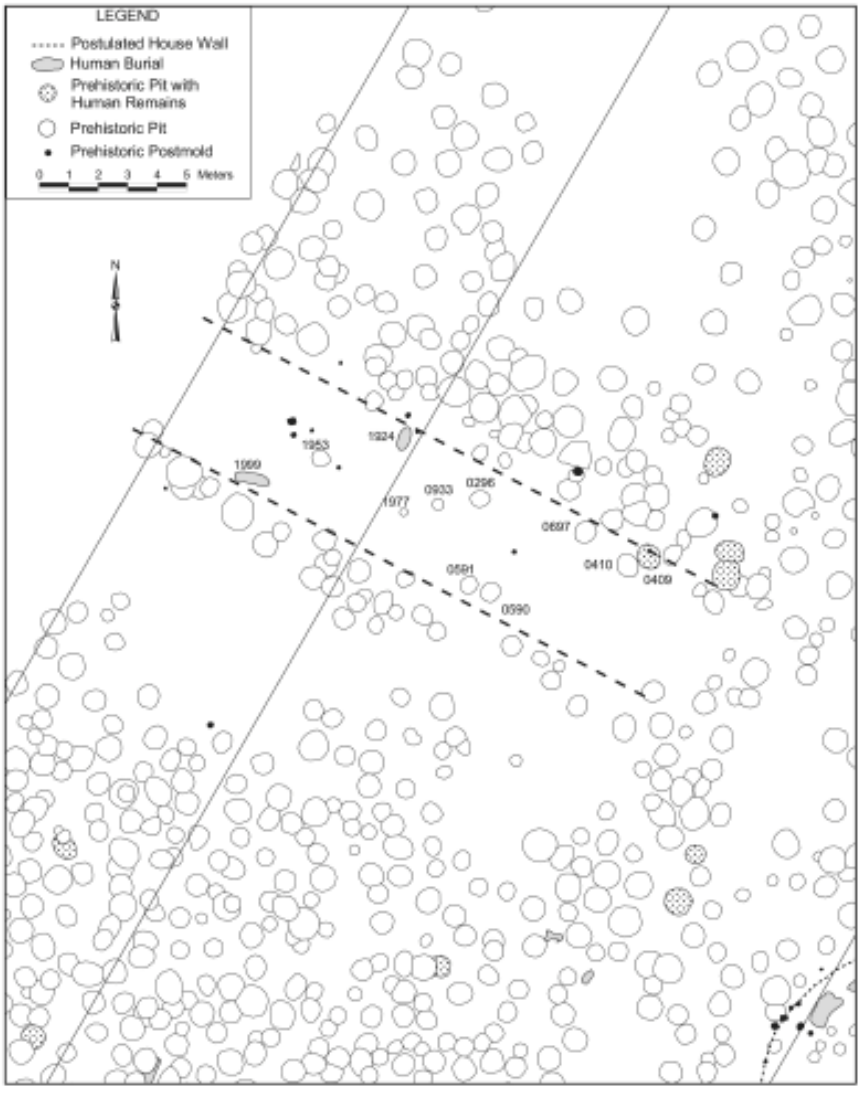

Figure 18: Proposed Longhouse at the Wever Site (Withrow and Benn 2004:134)

Burial features were avoided during excavation, except for five burials that were unintentionally disturbed (Features 99, 1290, 1292, 1592, 1630). Some osteological data was

collected from them and they were reburied *in situ* (Withrow 2004). When articulated human remains were encountered, excavation stopped, the exposed remains were mapped and recorded and then reburied (Hollinger and Vradenburg 2004). Therefore, primary burial data is incomplete for the site. However, for the human remains exposed by the excavation, burial data includes both primary and tertiary burials (**Table 9**).

Table 9: Cultural Modification of Human Remains from the Wever Site

	Primary	Tertiary	Total
None	4	6	**10**
Cutmarks	0	1	**1**
Multiple Modifications	0	2	**2**
Total	**4**	**9**	**13**

[1]Hollinger and Vradenburg (2004); Lillie and Schermer (2015b)

Fragmentary human bone was also found in test units and pit features located throughout the site found either on the surface or as isolated bone in non-burial features. These fragmentary remains were removed and analyzed (Hollinger and Vradenburg 2004; Withrow 2004). These include dental remains, as well as vertebrae, long bone, and cranial fragments (Hollinger 2005:60; Lillie and Schermer 2015b). Most of these isolated human remains were found in non-burial features, either termed as cache or refuse pits. Culturally modified human remains were also identified during excavations (**Table 10**). This includes cutmarks and evidence of burning that were found on isolated human remains at the site.

Table 10: Human Remains with Additional Cultural Modifications from the Wever Site

Feature	Context	Age	Sex	Element	Cultural Modification
Feature 409	"refuse pit"[1], "cache pit" [2]	35-50	indeterminate	occipital/ parietal fragment	8 cutmarks, burning
Feature 779	"bell-shaped pit" [1], "cache pit" [2]	adult	indeterminate	parietals, left and right	cutmarks
Feature 1503	"shallow pit" [1, 2]	adult	Male	mandible	cutmarks

[1]Hollinger and Vradenburg (2004); [2] Lillie and Schermer (2015b)

Additional modifications consisted primarily of cutmark, such as seen on the cranial fragment found in Feature 409 (**Figure 19**). The fragment contained evidence of periostitis, mostly healed, as well as burning at two locations (Hollinger and Vradenburg 2004:404). At least eight cutmarks were also present on the ectocranial surface (Hollinger and Vradenburg 2004:404).

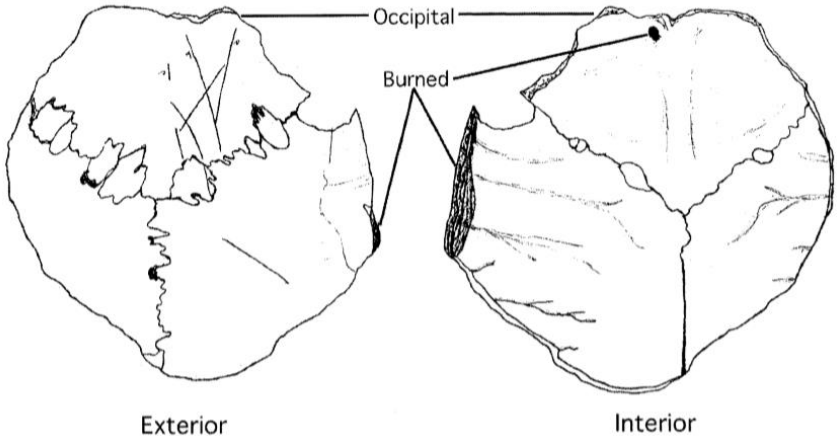

Figure 19: Ecto- and Endocranial Views of a Cranial Fragment with Cultural Modification from Feature 409 at the Wever Site (Hollinger 2005:62)

Feature 779 contained fragmented parietal bones, which were able to be re-articulated (**Figure 20**). Periostitis was again noted, as well as cutmarks (Hollinger and Vradenburg 2004:407).

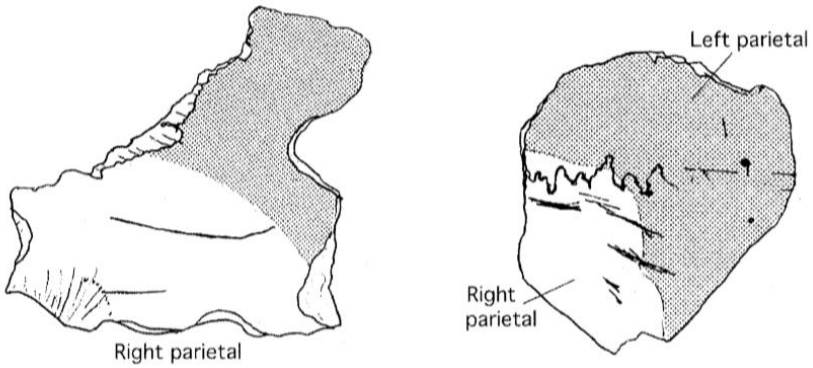

Figure 20: Modified Cranial Remains with Cutmarks and Burned Areas from Feature 779 at the Wever Site (Hollinger 2005:62)

A complete mandible was recovered from Feature 1503 (**Figure 21**). The cutmarks present were consistent with dismemberment, as they "were short and occurred in sets of three or more, probably resulting from sawing strokes" (Hollinger and Vradenburg 2004:415).

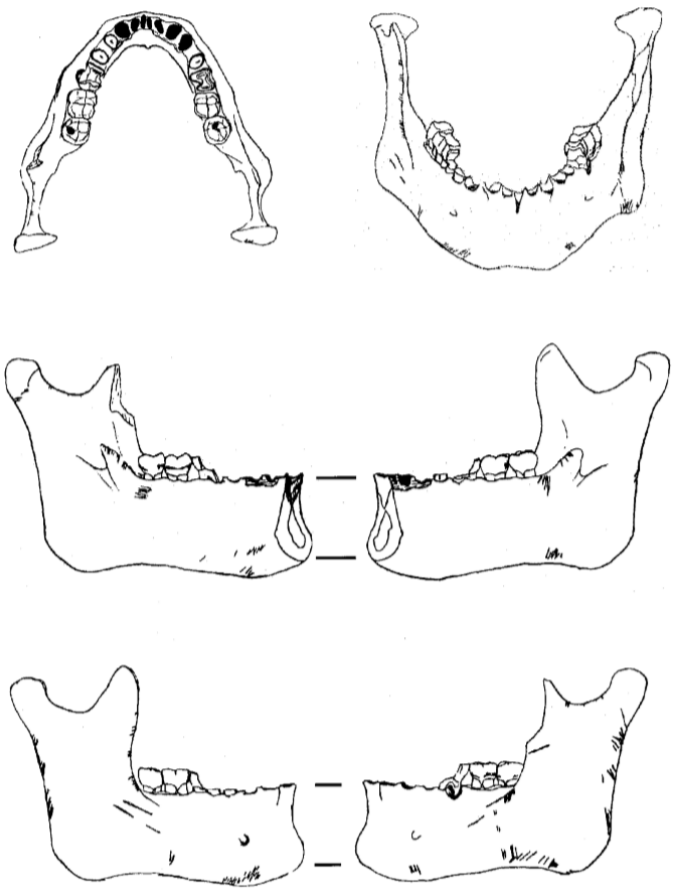

Figure 21: Cutmarks on a Mandible from Feature 1503 at the Wever Site(Hollinger 2005:65)

Summary

Large-scale excavations accounting for approximately 90 percent of the Wever site occurred in 1984 and 1985 as a part of a highway construction project. One longhouse structure was identified, while clusters of pit features were determined to possibly be remnants of other structures, the evidence for which was most likely destroyed by previously plowing of the area. Human burials were not excavated, but were found located within a circular structure and within

the identified longhouse. Isolated human remains were also encountered, but were located in features outside of both of these identified structures.

5.1.3 Wisconsin

Only one Oneota site will be used from Wisconsin, the Tremaine site in southwestern Wisconsin. The Tremaine site is in the La Crosse locality and was first occupied by the Oneota beginning around AD 1300 and lasting for the next three centuries (Boszhardt 1998). The skeletal remains from this site have been repatriated but the tribes have allowed the remains to continue to be housed at the Wisconsin Historical Society where they are available for limited research use. Due to the thoroughness of data already collected, information came from previously published data (Grauer 1995; O'Gorman 1995).

5.1.3.1 The Tremaine Site (47 Lc-95)

The Tremaine site is situated on the Onalaska Terrace along Halfway Creek in Onalaska Township, Wisconsin (O'Gorman 1995:3). It is a multicomponent site with a large Oneota occupation. Although the site was occupied for multiple Oneota horizons, it is often most attributed to the Classic horizon and Brice Prairie and Pammel Creek phases (O'Gorman 1995; Myster and O'Connell 1997:200). It is unlikely that the site was continuously occupied over the 100-300 years suggested by radiocarbon dates, as resources would have been depleted. Instead, the calculated use-lives of structures and feature density suggest shorter intermittent occupations with a maximum population of around 360 people (O'Gorman 1995:88).

In terms of area, the Tremaine site is one of the largest Oneota sites ever excavated. **Figure 22** demonstrates the Tremaine site boundaries, as well as the specific areas that were

excavated. Between the years of 1986 and 1991, the Museum Archaeology Program of the State Historical Society of Wisconsin conducted archaeological research as part of a highway project that impacted several Oneota sites located near La Crosse, Wisconsin (O'Gorman 1995:5-7). The sites excavated for the project consisted of OT (47 Lc-262), Filler (47 Lc-149), and Tremaine (47 Lc-95). These three sites, as well as the Firesign (47 Lc-359), the You Kids (47 Lc-249), and another unnamed site (47 Lc-248) are altogether known as the Tremaine Complex (O'Gorman 1995:1).

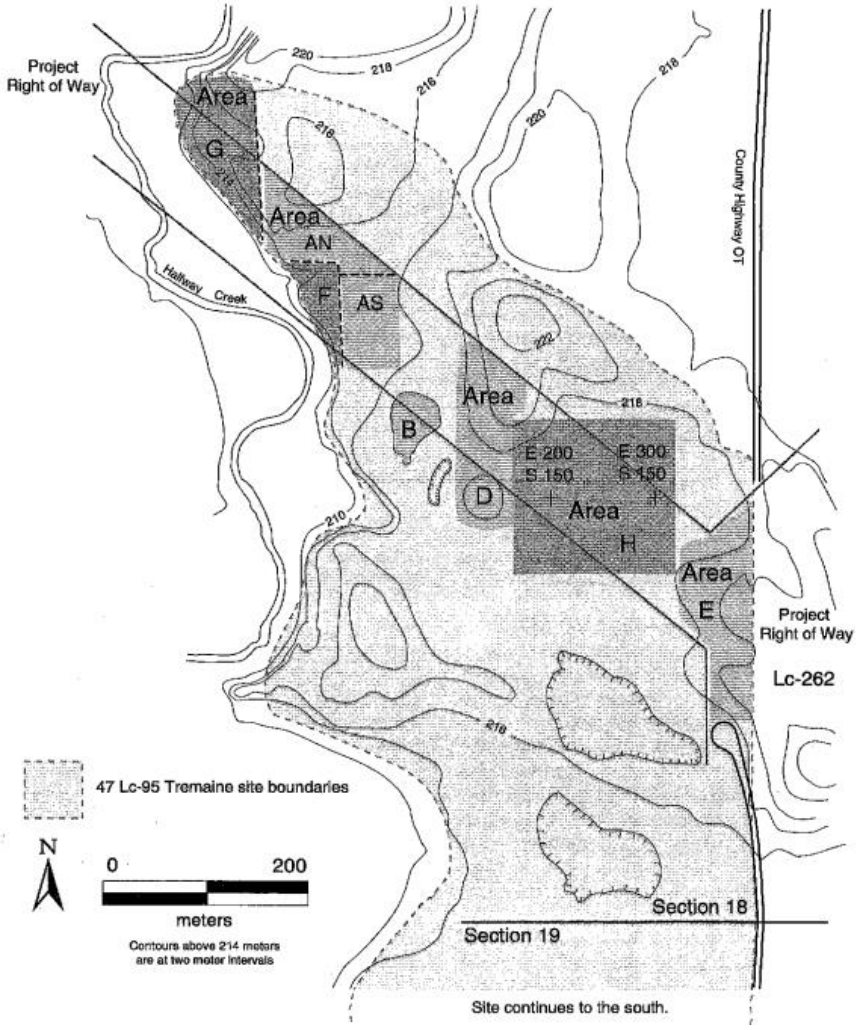

Figure 22: The Tremaine Site Project Area (O'Gorman 1995:50)

Documentation of the Tremaine site dates to 1906, "when Charles E. Brown placed it in the county site file system" (O'Gorman 1995:3). In 1981, an archaeological survey of the site was conducted, although the site had been subjected to previous collector surveys (O'Gorman 1995:5). Archaeological excavation of the area for the USH 53 Expressway Project was conducted from 1987 to 1990 and yielded 916 features and seven longhouses (O'Gorman 1995:5). Each longhouse was of single post construction and were described as having "long parallel sides with rounded ends," and all show evidence of rebuilding and expansion (O'Gorman 1995:79). They ranged in length between 14 to almost 50 meters (O'Gorman 1995:79) and are believed to have consisted of multiple family units (O'Gorman 2010).

Human Remains

The extent of excavations for the Tremaine site spanned the area affected for the Expressway Project. This included the identification of multiple site areas (see **Figure 22**). A total of 86 individuals from 79 primary and secondary burials were found within Area H of the Tremaine site, with isolated human remains found in Areas D, E, and H (O'Gorman 1995:178).

Mortuary practices consisted of within-structure burials at the Tremaine site (O'Gorman 1995:178), although a natural knoll was utilized for burials at the nearby OT site, which may be associated with the Tremaine occupation (O'Gorman 1993). Area H of the Tremaine site (see **Figure 22**) produced evidence for seven longhouses, which contained 79 primary and secondary interments (**Figure 23**) (O'Gorman 1995:56, 178). Based on radiocarbon evidence and the spatial patterning of the burials, it is argued that the burials were placed within the houses during the use of the structure, although there was variation in interment dates (O'Gorman 1995:79, 82, 87).

O'Gorman (1995:79) hypothesized that the longhouses were used primarily for domestic needs since there is no evidence that rebuilding or expansion was required for the burials. However, the presence of burials suggests that ritual activity also took place within these structures. Burials interred within longhouses in linear groupings that may be suggestive of family or kin relationships (O'Gorman 2001). Generally, both males and females were buried perpendicular to the house side walls, but males primarily had their heads toward the center of the structure, while this head direction was more variable for females. Females also had a higher percentage that were buried parallel to the house side walls, and generally more variability in their body positioning, suggestive of differing levels of social organization (O'Gorman 2001). O'Gorman (2001) argued that women had more control over production, storage, and access to subsistence, which would have created a surplus that increased their status within the household.

Most burials were located in Area H of the site and were located within longhouses structures. Four burials were located outside of known longhouse structures, although post mold patterning was difficult in these areas (O'Gorman 1995:179). The burials located within longhouse structures tended to be aligned with the long axis perpendicular to the side walls, with one end near the outer wall (O'Gorman 1995:179). Distribution within the houses followed a spatial separation into longitudinal halves, possibly reflecting a separation for the living and the dead (O'Gorman 1996:257). Clusters of graves were present within these structures, usually in a linear pattern along the sidewalls. Rows of graves were also identified, containing adults of both sexes, as well as adolescents, children, and infants (O'Gorman 1995:181, O'Gorman 1996:257). Additional paired and isolated burials were also found within structures, and these were variable in their age and sex composition (O'Gorman 1995:181). O'Gorman (1996:257-258) argues that

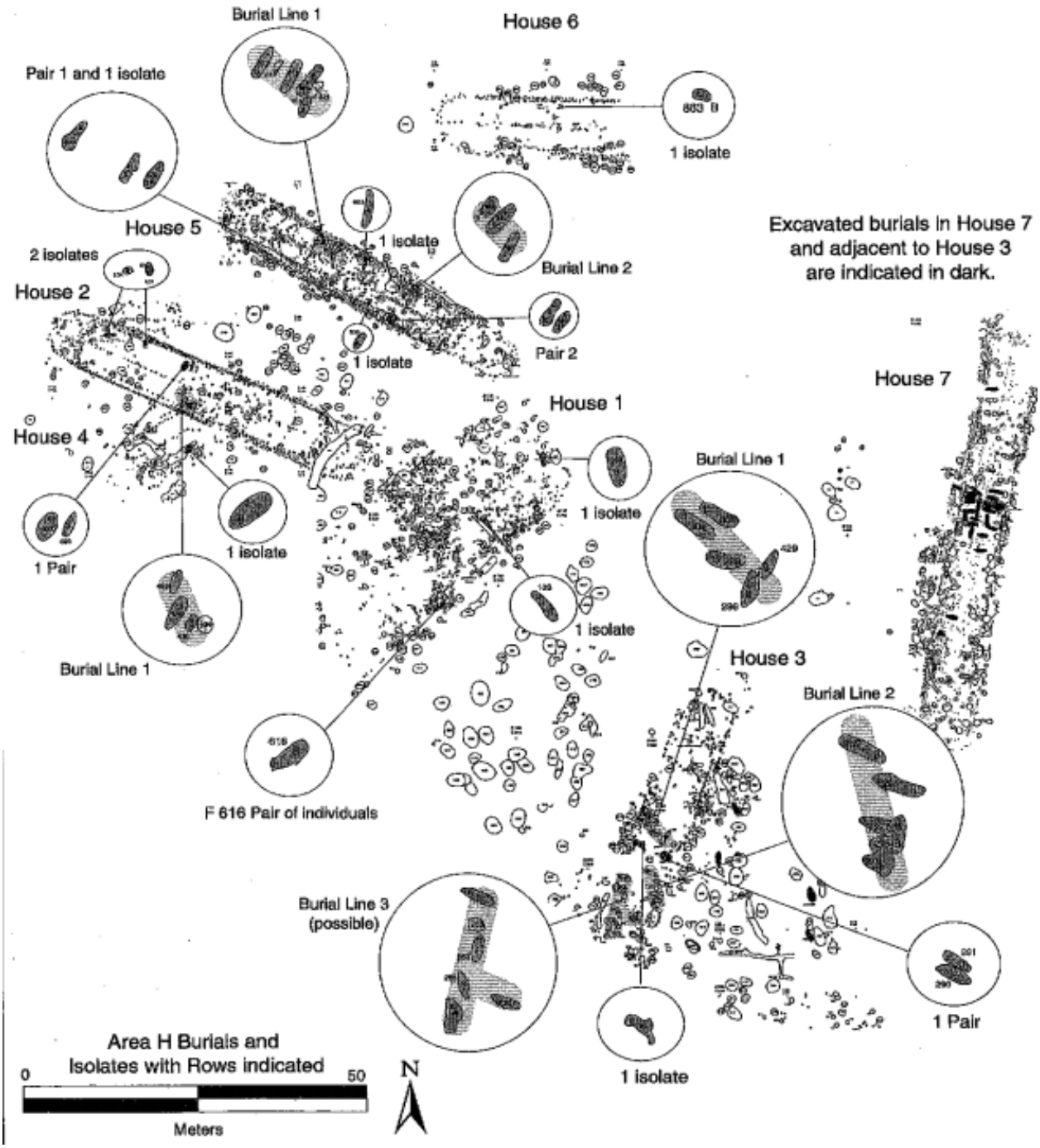

Figure 23: Burials and Isolated Human Remains in Area H at the Tremaine Site (O'Gorman 1995:180)

this patterning indicates use by family, kin, and corporate groups that was focused on the longhouse.

Human remains recovered from the Tremaine site include primary, secondary, and isolated (tertiary) contexts (**Table 11**). Most of the burials excavated at the Tremaine site were primary, extended, supine interments (O'Gorman 1995:182). Most interments were long and narrow, giving enough space for the individual to be buried in an extended position; while others were interred in possible storage or trash pits (O'Gorman 1993b:183). Other primary burials, although uncommon, included right side burials, prone burials, and semi-reclined burials. Secondary burials were also encountered, including bundled burials and redeposited bone (O'Gorman 1995:182-3). These secondary burials were deposited in "normal size graves", suggesting that they may have first been interred as primary burials, then received secondary processing and were redeposited into the same grave (O'Gorman 1995:183). Thus, there may have been a multi-phase burial treatment (O'Gorman 1995:193).

Table 11: Cultural Modification of Human Remains from the Tremaine Site

	Primary	Secondary	Tertiary	Multiple	Post-Interment Addition	Unknown	Total
None	58	7	28	1	1	21	**116**
Scalping	2	0	2	0	0	0	**4**
Total	**60**	**7**	**30**	**1**	**1**	**21**	**120**

Grauer (1995)

Mortuary vessels were found in some of the burial features, with approximately fifty to sixty percent of these interred with children, adolescents, and old adults. These vessels were "crude pinch-pots, globular pinch-pots, and mini pinch-pots" (O'Gorman 1995:186). While the number of vessels in each house varied, at least one individual in each structure was buried with a mortuary vessel (O'Gorman 1995:186). Triangular projectile points, known as Madison points,

were also found in the graves, mostly with young adults. Additional lithic remains, such as end scrapers, broken tools, and reworked flakes were also found (O'Gorman 1995:187). Flakes are not commonly thought of as Oneota grave goods, but some flakes were in direct association with the skeletal remains, suggesting that the inclusion of flakes has been overlooked at other sites (O'Gorman 1995:186). Relatively uncommon mortuary artifacts included red ochre, copper, bone, shell, charcoal, and other plant remains. (O'Gorman 1995:187).

Grauer (1995) analyzed the human remains and suggested that based on the demographics, the Oneota at the Tremaine site practiced selective burial. "Spatial organization, modes of disposition, and grave goods suggest social divisions are defined primarily along lines of longhouse affiliation and subgroups within the structures as evidenced by the use of spatial partitioning of interments" (O'Gorman 1995:194).

Although human burials were only found in Area H of the site, isolated human remains were encountered in Areas D, E, and H (O'Gorman 1995:181, 183). Within Area H, isolated remains were found in graves and within a total of 36 other features. Areas D and E also included isolated human remains in three features (O'Gorman 1995:183). The recovered isolated human remains from areas D, E, and H of the site are from adolescents and adults and are most often cranial elements, with the exception of subadult loose dentition (O'Gorman 1995:181). Although it is unknown how isolated human remains fit into the mortuary program at Tremaine, possible explanations include "redeposition of disturbed interments, loss of elements during secondary processing, or dismemberment" (O'Gorman 1995:182). Evidence of cultural modification is present for five individuals, expressed as violence, come from one case of an embedded projectile point and four cases of scalping (**Table 12**).

Table 12: Human Remains with Additional Cultural Modifications from the Tremaine Site

Feature	Context	Age	Sex	Elements	Cultural Modification
Feature 216	feature	unknown	indeterminate	cranial	scalping
Feature 840	feature	unknown	indeterminate	cranial	scalping
Feature 956a	burial	adolescent	indeterminate	cranial	scalping
Feature 507	burial	adolescent	female	cranial	scalping

Grauer (1995)

Two of the scalping cases were from isolated human remains that were found in pit features (Features 840 and 216) (Grauer 1995:420). The third scalped individual was a young female buried in a semi-reclined position and the fourth was a young adult (Feature 956a) buried with two other individuals (Grauer 1995:367-368). The individual with the embedded projectile point (Feature 967) was an adult male, buried in a primary, extended and supine position, with three other projectile points near the upper left arm suggestive of grave goods (Grauer 199:368).

Summary

The Tremaine site remains the most expansive excavation of an Oneota site. The Tremaine site and other nearby sites were excavated due to a highway project. A three-year long excavation produced evidence of seven longhouse structures over multiple areas of the site. Human burials were located in one area of the site (Area H) and were concentrated in longhouses. Isolated human remains were rare, but were encountered in three areas of the site (Areas D, E, and H). Due to the expansive excavations that took place, mortuary analysis was performed (O'Gorman 1995) and it was concluded that burials within the longhouse are suggestive of kin and family relationships.

5.2 Additional Sites Used for Analysis

As data used for this dissertation were limited, additional sites that did not meet the criteria for inclusion (presence of burials) were included to increase sample size and attempt to confirm any results. This included the sites of Correctionville and Dixon in Iowa and the site of Armstrong in Wisconsin (**Figure 24**).

Figure 24: Distribution of Oneota Sites including Additional Sites

5.2.1 Correctionville

The Correctionville site (13WD6) is a habitation site located on a terrace remnant of the Little Sioux River in northwestern Iowa (Benton 2001:57; Lillie and Schermer 2016:183). It is associated with the Correctionville phase, lasting from approximately AD 1375 to 1500 (Benton 2001:52). The site was first identified as "containing burials and refuse pits" by Charles R. Keyes in the 1920s (Lillie and Schermer 2016:183). Archaeological material from the site was collected and reported on by the Northwest Chapter of the Iowa Archaeological Society during

the 1950s after quarrying began in the region (Benton 2001:57; Lillie and Schermer 2016:183). Human remains in shallow pits were encountered and removed in 1957 during stripping of the area (Lillie and Schermer 2016:183). After discovery, small-scale excavations occurred by the Northwest Chapter of the Iowa Archaeological Society (Lillie and Schermer 2016:183,185). These salvage operations identified 27 features containing Oneota cultural material (Benton 2001:57).

Human Remains

The human remains found in 1957 were excavated and removed. A minimum of eight individuals were represented (**Table 13**).

Table 13: Cultural Modification of Human Remains from the Correctionville Site

	Primary	Tertiary	Total
None	2	5	**7**
Cutmarks	0	2	**2**
Multiple Modifications	0	1	**1**
Total	**2**	**8**	**10**

Lillie and Schermer (2016)

Cultural modification as evidenced by cutmarks was present on some of the human remains (**Table 14**). Cutmarks in the form of short nicks were present on the long bones of a juvenile and a female adult and appear to be consistent with defleshing (Lillie and Schermer 2016:195). Long bones from a juvenile, possibly the same individual, also had cutmarks on the facial bones, also suggestive of defleshing (Lillie and Schermer 2016:195). Unfortunately, the context for the individuals recovered is unknown and/or lost.

Table 14: Human Remains with Additional Cultural Modification from the Correctionville Site

Context	Age	Sex	Elements	Cultural Modification
Unknown	14.5-16.5	indeterminate	left maxilla/zygoma	70 cutmarks
Unknown	25-45	female	left humerus, left and right radii and ulnae	21 cutmarks
Unknown	12.5-16.5	indeterminate	left tibia	5 cutmarks

Lillie and Schermer (2016)

Summary

Only small-scale excavations and salvage operations have occurred at the Correctionville site. During these excavations isolated human remains were encountered, as well as two burials. As general site size and structure is unknown, it is unclear as to the location and relationship of these burials and isolated human remains to the mortuary program.

5.2.2 Dixon

The Dixon site (13WD8) is located in northwestern Iowa along a terrace of the Little Sioux River (Van Nest 1999:17). The Dixon site is also associated with the Correctionville phase, with the site dating between AD 1300 and 1440 (Benton 2001:54). Multiple professional archaeological excavations have occurred at the site, in addition to looting of cultural material and human remains (Fishel 1995:5, 1999:6). First documentation of the site is from 1957, in which approximately twenty burials were disturbed, but no archaeological investigations occurred (Nolder n.d.:2).

In 1964 the University of Wisconsin conducted excavations that uncovered features and a structure believed to be a longhouse (Fishel 1995:6; Benton 2001:53). In 1984, the University of Iowa Office of the State Archaeologist surveyed the site surface (Fishel 1995:7; Nolder n.d.:2). Additional lithics, ceramics, and faunal remains were found, as well as two pit features (Fishel 1995:5). The Illinois Archaeological Survey conducted a field school survey in 1989, during

which lithics, ceramics, and other artifacts were found (Fishel 1995:7). Finally, due to significant flooding of the site, salvage excavations were conducted in 1994 by the University of Iowa Office of the State Archaeologist (Fishel 1995:5) to stabilize the bank of the Little Sioux River that had eroded much of the site (Nolder n.d.:1). A total of 44 features and three rectangular or ovoid structures were uncovered (Benton 2001:54).

Human Remains

Human remains were recovered from the site on multiple occasions after the 1994 flooding of the site (Lillie 1999:109). The remains used for this dissertation belong to at least seven individuals, and all were found eroding from the west cutbank of the Little Sioux River (Lillie 1999:109 (**Table 15**).

Table 15: Cultural Modification of Human Remains from the Dixon Site

	Tertiary	Total
None	10	**10**
Cutmarks	2	**2**
Multiple Modifications	1	**1**
Total	**13**	**13**

Lillie (1999)

Of these individuals, a few elements were found to be culturally modified (**Table 16**). this included unusual modifications, such as incised designs and notching along removed edges of bone.

Table 16: Human Remains with Additional Cultural Modifications from the Dixon site

Context	Age	Sex	Elements	Cultural Modification
Feature	25-35	male	cranium	removal of inferior edge, notching, abrasion
Unknown	indeterminate	indeterminate	cranial fragment	birdman design

Lillie (1999)

One instance of cultural modification was a cranium found in an eroding feature (Lillie 1999:113) (**Figure 25**). Although some portions of the cranium are missing and has postmortem damage, there are cutmarks located on the "frontal bone, left parietal, left temporal, occipital, right zygoma, and both maxillae" that are suggestive of "defleshing and disarticulation of the mandible" (Lillie 1999:114). The right parietal and right frontal bones have been cut and a notched border was created along the edges, with many of the cut edges also smoothed or abraded (Lillie 1999:114,116).

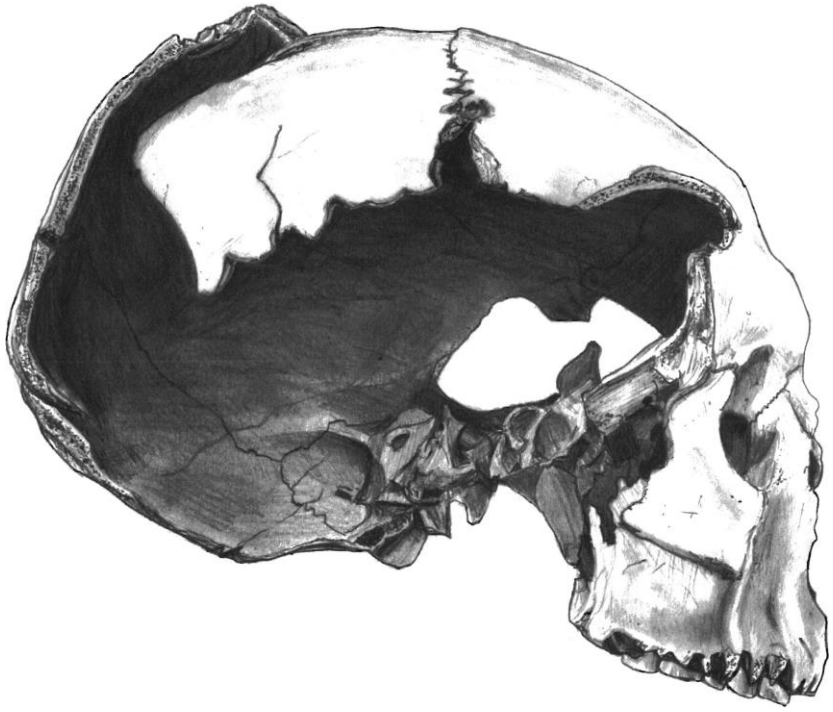

Figure 25: Culturally Modified Human Skull from the Dixon Site (Lillie 1999:115)

An additional skull fragment with an incised "birdman" design was found eroding out of a cutbank during excavations in 1989 (Fishel 1999:6) (**Figure 26**).

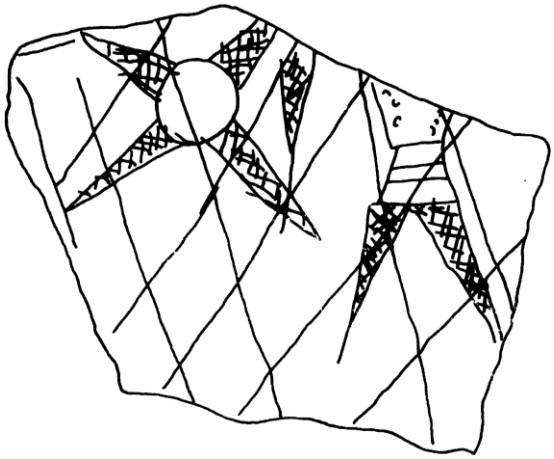

Figure 26: Cranial Fragment with Incising from the Dixon site (Fishel 1999:6)

Summary

Much of the Dixon site was impacted by erosion. Limited excavations have occurred at the site; most notably the salvage operations occurring in 1994. Although human remains were documented prior to this excavation, many of those individuals are lost, unaccounted for, or commingled. The 1994 excavations, however, did documented the remains at least seven individuals, many of which had been affected by erosion. Due to the nature of the site, much of the provenience and site information is limited.

5.2.3 Armstrong

The Armstrong site, located in Pepin County, Wisconsin, was occupied from approximately AD 1010 to 1190 during the Emergent horizon (Hurley 1978). The site is located on a flat terrace south of Hicks Valley Creek, which had a "cover of tall grasses and scattered oak to form a brush prairie" (Hurley 1978:8). Similar to other Oneota sites, the occupants of the Armstrong site could utilize a number of different resources: "the Pepin Prairie for herd animals such as buffalo, the bluff and upland for deer and other woodland resources, the Chippewa slough area for the rich flora and fauna normally associated with a riverine swamp, and Lake

Pepin and the Mississippi for aquatic and non-aquatic resources" (Hurley 1978:85). The site is thought to have occupied an area of 28.5 hectares, with a main occupation area of around 75 square meters (Hurley 1978). An additional small neighboring village site (47-Bf-26) is believed to be a "sister village" to the Armstrong site. Both sites lie north of the border of the Wisconsin Driftless Area (Hurley 1978:5).

The first known report of the site was from Reverend Thorley Johnson in 1949, who recorded a village site with mounds along the margins (Hurley 1978). He found the site to be similar to other Orr phase sites in the area, with the exception of some ceramic rim and shoulder decorations (Hurley 1978). In 1971, an archaeological survey was conducted in the area in order to examine a large region for PaleoIndian sites, as well as evidence of Effigy Mound and Oneota contact (Hurley 1978). From this survey, two sites discovered were subjected to further testing in 1972; the Weisenbeck Site (47-Bf-20) and the Armstrong site (47-Pe-12 and 47-Pe-4) (Hurley 1978). An additional area of Oneota artifact concentration (47-Pe-7) was located just north of the village site; however, it was not fully explored (Hurley 1978).

The purpose of the excavations at the Armstrong site in 1972 were to determine the limits of the village and locate the main occupation area (Hurley 1978). Excavations uncovered two semi-subterranean house structures and 24 features, as well as two suspected house structures (Hurley 1978). The mounds surrounding the village were heavily looted and disturbed and did not produce any artifacts (Hurley 1978). Based on the ceramic assemblages found at the Armstrong site, connections between Armstrong and the Bryan and Barton sites in Minnesota are inferred (Hurley 1978). A diverse floral and faunal assemblage, including evidence of maize, was also found at the Armstrong site, suggesting that the occupants represent a "stable farming community drawing upon numerous economic resources" (Hurley 1978:94).

Human Remains

Although no primary burials were located at the site, twelve isolated and fragmented human remains were recovered as surface finds and within features inside and adjacent to House 1 (Savage 1978) (**Figure 27**). A skull from Feature 5 of House 1 was reconstructed from multiple fragments and was determined to be from an adult individual and displayed ochre staining (Savage 1978). Evidence of ochre was also found on a portion of a right maxilla from Feature 3 in House 1 (Savage 1978).

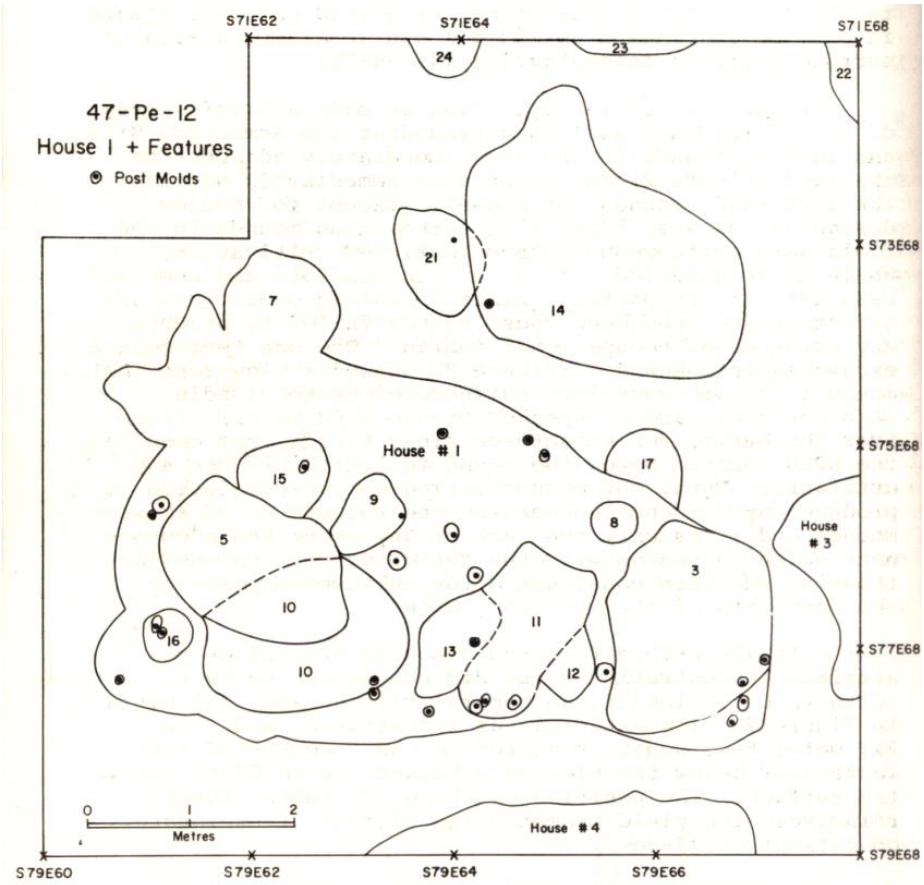

Figure 27: House 1 at the Armstrong Site (Hurley 1978:12)

Human remains recovered from the Armstrong site were found only in tertiary contexts (**Table 17**).

Table 17: Cultural Modification of Human Remains from the Armstrong Site

	Tertiary	Total
None	2	**2**
Cutmarks	1	**1**
Multiple Modifications	1	**1**
Total	**4**	**4**

Savage (1978)

Of the human remains recovered, two displayed evidence of cultural modification (**Table 18**). A mandibular fragment recovered from Feature 14, a pit located adjacent to House 1, displayed evidence of burning and incising. The mandible "showed local charring, and a series of superficial incised grooves made after the charring" (Savage 1978:128). It is likely that the bone was previously "dry and fragmented when brought into contact with a small fire" (Savage 1978:128).

Table 18: Human Remains with Additional Cultural Modifications from the Armstrong Site

Feature	Context	Age	Sex	Elements	Cultural Modification
Feature 14	pit adjacent to house	indeterminate	indeterminate	mandible fragment	burned, incised
Feature 3	house pit	indeterminate	indeterminate	right parietal fragment	cut sagittal suture

Savage (1978)

A fragment of a right parietal bone was recovered from Feature 3, a pit in House 1, and had been incised for an "oblique removal of some of its interdigitating [sagittal] sutural processes" that was caused by a "sharp cutting edge" (Savage 1978:128). It is unknown what additional cultural materials, if any, were found in the pit features.

Summary

Excavations at the Armstrong site produced evidence of multiple house structures and a few isolated human elements. These elements were located in non-burial pits. The two modified

human elements and one pit feature with fragmented elements were associated with one house. While an additional fragmented element was found on the site surface.

5.3 Summary

It is the goal of this dissertation to analyze multiple Oneota sites from different regions, phases, and time periods (**Table 19**). However, during the data collection process many unforeseen circumstances occurred that limited the number of sites that could be utilized. Sites were primarily excluded based on the lack of spatial and locational data, including lack of site records or documentation. Thus, data for this dissertation came from six primary sites that contained evidence of primary burials and tertiary remains with or without additional cultural modifications (except for McKinney in Iowa). An addition three sites with limited data were also included in analysis to increase sample size and to test conclusions.

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Table 19: Context for Human Remains for Nine Oneota Sites

	Hoxie Farm	Morton Village/ Norris Farms 36	Tremaine	Howard Goodhue	McKinney	Wever	Armstrong	Correctionville	Dixon	Total
Primary Burial	20	203	58	5	0	4	0	2	0	**292**
Secondary Burial	1	1	7	14	0	0	0	0	0	**23**
Tertiary Remains	39	16	28	6	12	6	2	5	10	**124**
Multiple Burial	2	10	1	0	0	0	0	0	0	**13**
Post-Interment Addition	0	2	1	0	0	0	0	0	0	**3**
Primary and Additional Modification	0	0	0	0	0	0	0	0	0	**0**
Primary and Trauma	1	19	2	0	0	0	0	0	0	**22**
Secondary and Additional Modification	0	1	0	0	0	0	0	0	0	**1**
Secondary/Unknown and Trauma	0	6	0	0	0	0	0	0	0	**6**
Tertiary and Additional Modification	13	0	0	2	7	3	2	3	3	**33**
Tertiary and Trauma	0	0	2	0	1	0	0	0	0	**3**
Multiple/ Post-Interment and Trauma	0	19	0	0	0	0	0	0	0	**19**
Unknown	11	5	21	0	0	0	0	0	0	**37**
Total	**87**	**282**	**120**	**27**	**20**	**13**	**4**	**10**	**13**	**576**

CHAPTER 6: METHODS

6.1 Introduction

Human remains and objects in the archaeological record can be broken and discarded in multiple ways and distinguishing between the processes that led to their fragmentation and modification, including taphonomy, cremation, dismemberment, mortuary processing, accident, or other postmortem modifications, is difficult. A mortuary deposit is only part of a multi-staged, cyclical mortuary process that can be altered by many post-depositional processes (Hutchinson and Aragon 2002; Weiss-Krejci 2011). As fragmented human remains are found in multiple depositional contexts, this research will utilize a bioarchaeological, contextual, and taphonomic approach to allow for the construction of both life and death histories of the human remains. Multiple lines of evidence, including archaeological, mortuary, ethnographic, taphonomic, and osteological data will be used to distinguish the processes the remains underwent after biological death, but not necessarily social death.

6.1.1 Taphonomic Approaches

Although various standards for skeletal data collection have been created, most notably Buikstra and Ubelaker (1994), these standards were created for relatively complete, and often primary, burials and do not provide detailed ways to collect data using fragmented remains or culturally modified remains. Researchers have developed methodologies, guidelines, and theoretical approaches for commingled, disarticulated, and fragmented remains (Ubelaker 2002; Adams and Konigsberg 2004; Knüsel and Outram 2004; Outram et al. 2005; Adams and Byrd 2008, 2014; Byrd and Adams 2003, 2009; Nikita and Lahr 2011; Osterholtz et al. 2014; Lambacher et al. 2016; Mack et al. 2016; Osterholtz 2016a). Many of these approaches have

modified or adapted methodology from the zooarchaeological and paleoanthropological sources (e.g. Grayson 1984; Klein and Cruz-Uribe 1984; Dobney and Rielly 1988; Lyman 1994a; Marean et al. 2001; Reitz and Wing 2008), taphonomic approaches (e.g. Behrensmeyer et al. 1986; Haglund and Sorg 1997; Ubelaker 1997; Domínguez-Rodrigo et al. 2009; González et al. 2015; Braun et al. 2016), or forensic and bioarchaeological literature (e.g. Maples 1986; Sauer 1998; Smith 1997b; Sorg and Haglung 2002; Symes et al. 2002; Andrushko et al. 2005, 2010; Martín and Vargas 2007; Tiesler 2007; Loe 2008; Pérez et al. 2008; Tung 2008; Beary and Lyman 2012; Martin et al. 2013; Symes et al. 2014; Knüsel and Robb 2016).

The taphonomic processes that cause modification, known as taphonomic agents, can be classified as "hominid (cultural, human), natural (biological, biogenic), and physical (chemical, geological, mechanical)" (Marshall 1989:11). These are similar to the cultural and natural formation processes, as originally described by Schiffer (1976), in which cultural formation processes (C-Transforms) are alterations caused by humans, while natural formation processes (N-Transforms) are those that occurred from natural causes. Both natural and physical taphonomic processes are the result of environmental factors and can be either abiotic or biotic (Nawrocki 2008). Abiotic forces result from environmental factors, such as sediment, rainfall, temperature, and wind, while biotic forces result from animal and human activities (Martin et al. 2013).

Taphonomic agents can be both intrinsic (arising from the bone itself) and extrinsic (arising from processes not attributed to the remains themselves) and may act together or independently (Henderson 1987). Intrinsic differences, such as the shape, size, and density of the bone, can lead to variations in the breakdown of bone over time (Henderson 1987). Individual factors of the decedent, such as weight, age, and sex, also affect bone breakdown over time

(Nawrocki 2008). Extrinsic factors consist of differences within the environment (water, soil type, temperature, and oxygen), the local flora and fauna (micro- and macro-organisms), and human interaction with the dead, all of which may damage or disturb the remains (Henderson 1987). As many taphonomic events can follow a multitude of pathways, it is important to recognize that bones may show signs of a combination of taphonomic agents (Rogers and Kidwell 2007). Due to these complex relationships, a holistic approach should be used to interpret taphonomic processes (Nawrocki 2008). A "taphonomic profile" should include a thorough recovery of the remains, detailed descriptions of their condition, and knowledge of taphonomic processes specific to that environment (Nawrocki 2008).

6.1.2 Natural and Physical Taphonomic Agents

Natural (biological) concentrations include processes that can be intrinsic (product of the behavior of the vertebrate) or extrinsic (product of other biological entity, most often predators). Extrinsic biogenic processes are most often the result of animals, such as tooth marks or cutmarks from carnivores, and gnawing from rodents (Ubelaker 1997). Trampling from animals can result in scratches, fractures, and movement of bones both vertically and horizontally (Lyman 1994b:403).

Physical taphonomic processes include hydraulic (e.g. wind, water, waves, or sediment) and sedimentologic (variation in accumulation of inorganic material, either as omission, erosion, or deposition) processes. Processes such as abrasion and corrosion will physically remove portions of bone surfaces. Abrasion usually results in a polish on bone surfaces from particles, including sediment and water, while corrosion refers to a chemical or biochemical bone (Eberth et al. 2007). Bone weathering includes "temperature chances, wetting and drying, freezing and

thawing, and UV exposure" (Eberth et al. 2007:309) and is the result of "the mechanical and chemical deterioration of bone" (Lyman 1994b:403). Other processes, such as those caused by root etching or insects, are considered bioerosion (Eberth et al. 2007). Although multiple natural and physical taphonomic processes can occur, the ones that have the greatest effect on remains are often temperature, water, and exposure (Nawrocki 2008). Each of these natural and physical taphonomic processes can occur individually or in combination (Ubelaker 1997).

6.1.3 Humans as Taphonomic Agents

Distinguishing human activity from biological and physical taphonomic processes can often be challenging (Marshall 1989), as some natural processes can cause alterations that resemble those that are induced by human action, especially use-wear (Lyman 1994b). The taphonomy that affects human remains can be influenced by a number of factors, including internal ("cause of death, state of the body at death, age, sex, body mass, and pathology") and external ("time elapsed between death and burial, the treatment of the body prior to burial, and the burial environment") factors, in addition to non-cultural taphonomic processes (Roksandick 2002:101). Although many factors that contribute to the taphonomic alteration or preservation of animal bones are similar or the same as those that influence human bone, human bones often undergo additional processes, such as ritual, burial, and disposal (Waldron 1987; Ubelaker 1997). During funerary treatment, human remains can undergo many postmortem changes, including pre-depositional treatments, type of deposition (e.g. burial, cremation, disarticulation) and funerary practices (e.g. grave structure, position of body), and post-depositional processes that are both cultural (e.g. manipulation or removal of bones) and natural or physical (e.g. animal activity, soil, pressure, disturbance) (Bello and Andrews 2006; Duday 2006; 2009).

There are also many natural agents that may appear cultural in origin (Saul and Saul 2002). For example, roots may split long bones to resemble processes of cannibalism or create openings in bones resembling projectile wounds. Erosion of bone surfaces may appear as pathologies, and normal anatomical markings, such as vessel impressions, may appear as cutmarks (Saul and Saul 2002). Carnivore or rodent tooth marks may also appear similar to human-induced cutmarks; however, these tooth marks often follow the bone contour, are often oriented perpendicular to the long axis of the bone and may have accompanying tooth puncture marks (Loe 2008). Therefore, osteological, anatomical, forensic, and taphonomic knowledge is necessary to determine the difference (Roksandick 2002; Saul and Saul 2002).

Natural and physical taphonomic processes can appear like human-induced trauma, known as pseudotrauma, including weathering that may look like blunt force trauma, trampling and chewing marks that produce spiral fractures or sharp force trauma, and black fungus that may appear similar to burning (Ubelaker 1997). Some researchers have focused on developing methodologies for distinguishing between taphonomic agents using experimental studies that allow for control of variables (Haglund and Sorg 1997). For example, Domínguez-Rodrigo et al. (2009) used multiple variables to distinguish between trampling, cutmarks made with simple flakes, and cutmarks made with retouched flakes. The protocol developed uses low magnification with lists of criteria that are used to distinguish between these taphonomic events (Domínguez-Rodrigo et al. 2009). Overall, cutmarks made with simple flakes generally are at least as deep as they are wide and are deeper than trampling marks. Neither the sediment size or the time of exposure to trampling affected the morphology of the marks, as prolonged exposure to trampling was found to increase the dissimilarities between trampling and cutmarks (Domínguez-Rodrigo et al. 2009). Behrensmeyer et al. (1986) also examined the microscopic

differences between trampling and cutmarks, in which several criteria were determined for distinguishing the two processes. Trampling marks usually have multiple, shallow marks, while cutmarks tend to be singular and deep (Behrensmeyer et al. 1986). The placement of marks is also important, as cutmarks related to dismemberment will be near areas of ligament and muscle attachment, while trampling marks will appear on flattened, rounded, or convex bones (Behrensmeyer et al. 1986). Behrensmeyer et al. (1986) concluded that microscopic analysis of the marks is not enough, as patterning and placement of the cutmarks and archaeological context are needed to distinguish the two processes.

In addition to the variations found in cutmark morphology for fresh versus dry bone, variation in cutmarks are further complicated by the tool that is used to create it in terms of material and attrition, as well as the portion of the bone that is cut (Braun et al. 2016). As these scratches and marks can often appear similar to human-induced marks, researchers have conducted studies that have focused on recording and classifying cut mark morphology. However, according to González et al. (2015), many of these studies have limitations with the use of a microscope, such as high costs and, thus, small samples. It is therefore important that practical more cost effective and user-friendly methods be used.

6.1.4 Timing of Injury

To aid in distinguishing between human and biological or physical causes of taphonomic signatures, methodological approaches determining the cause of the taphonomic event and the timing of the injury should be used. The forensic and medicolegal temporal categories of antemortem, perimortem, and postmortem have been utilized in taphonomic research. Postmortem injuries are those that occurred after death, while antemortem injuries occurred

before death and are recognized based on evidence of bone remodeling or infection. Perimortem injuries occur at or around the time of death and are associated with the manner of death (Sauer 1998). Perimortem injuries occurring before death generally indicate that the injury occurred within a week prior to death (Sauer 1998). However, distinguishing perimortem from postmortem injuries is often difficult, as processes that occur during the perimortem interval will appear similar to that of fresh bone (Beary and Lyman 2012; Symes et al. 2014) because the organic and inorganic components (calcium hydroxyapatite, collagen, and water) have not completely been lost (Maples 1986; Symes et al. 2014). It is often difficult to distinguish the timing of the event when this occurs, as it may take several weeks after death for a significant loss of the organic components (Maples 1986; Sauer 1988).

Although these categories have been utilized in taphonomic research, along with the addition of post recovery and archival taphonomic periods, the perimortem taphonomic period encompasses the time in which bone is considered 'fresh' (Sorg and Haglung 2002; Symes et al. 2002). This is primarily due to the differences in the role of forensic examiners (i.e. medical examiners/coroners) and anthropologists, as "the burden of cause-of-death judgment falls on medical doctors", while anthropologists examining taphonomy "are more likely to focus on the material, organic, and ecological properties of human remains" (Symes et al. 2002:406). Symes et al. (2014:362) further argued that the term 'perimortem' should "refer to the bony response as indicative of either wet or dry bone." After this determination has been made, the timing of the injury can be estimated based on context. For example, dismemberment occurs postmortem; however, taphonomically it may occur when the bone is still fresh, and therefore would be considered perimortem (Symes et al. 2002). As can be seen in **Table 20**, the importance of wet/fresh versus dry bone is due primarily to the physical properties of the bone itself that will

influence the modification of the bone, as bone will respond differently based on whether it is fresh, dried, or weathered, in addition to other biological and physical factors (Hill 1989; Marshall 1989).

Table 20: Timing of Injury and Associated Signs

Timing of Injury	Taphonomic Period	Osteological Signs	Inference about Injury
Antemortem	Pre-depositional	Injury will have smooth margins at fracture surface with signs of healing, active bone formation.	Injury was not fatal, occurred before death
Perimortem (at time of death)	Depositional	May have evidence of trauma (e.g. weapon), fresh bone fracture	Possible association with cause or manner of death, suggests accidental injury or homicide
Perimortem (after time of death)	Depositional	Fresh bone reaction: helical or spiral fracture outline, sharp fracture margin, smooth fracture surface.	Possible association with mortuary ritual or postmortem processing by natural or cultural agents
Postmortem (fresh bone)	Post-depositional	Fresh bone reaction: helical or spiral fracture outline, sharp fracture margin, smooth fracture surface.	Non-cultural taphonomic processes. Can also include cultural processing, dismemberment, and disarticulation.
Postmortem (dry bone)	Post-depositional	Dry bone reaction: helical fracture outline, sharp fracture margin, uneven fracture surface and texture.	Non-cultural taphonomic processes. Can also include cultural processing and modification.
Postrecovery	Postrecovery	Modifications from recovery, examination, or storage: coloration of the fracture surface, fracture margin irregular, fracture surface is rough	Modifications from recovery, examination, or storage

Adapted and modified from Walker 2001; Sorg and Haglund 2002; Knüsel 2005

6.1.5 Distinguishing Perimortem and Postmortem

Fracture patterns and cutmark morphology can be used to determine if the bone was wet or dry at time of impact, including indicators such as color; fracture termination; and fracture outline, angle, and surface (Symes et al. 2014). As taphonomic processes will affect the external and internal surfaces of the bone differently, bones that fracture after exposure to biological and physical processes will often display color differences for both fracture patterns (Symes et al. 2014) and cutmark morphology (Martin et al. 2013). However, the converse is not always true, as not all perimortem injuries will display homogenous color (Symes et al. 2014).

For cutmark morphology, trowel marks can be easily distinguished from cutmarks or chopmarks, as trowel marks will generally be straight, U-shaped, lack patterning, and demonstrate a color difference (Martin et al. 2013). For fractures, certain fracture patterns, such as "concentric circular fracture lines, radiating fracture lines, and the stellate fracture pattern are typical patterns of fresh bone fractures" (Maples 1986:221). Once the organic components of bone are lost, causing the bone to become hard and brittle, the bone's response to the timing and speed of the impact are lost as well, which lowers the amount of strain the bone can withstand (Maples 1986; Symes et al. 2014). Thus, dry bone tends to display fractures that run parallel or perpendicular to the bone grain with irregular margins, while fresh bone fractures will fall into fracture classifications (spiral, transverse, oblique, butterfly, etc.) and will often display radiating fractures with sharp and obtuse fracture angles (Symes et al. 2014; Knüsel and Robb 2016). Finally, when examining cross-sections of the fracture, the surface for wet bone will generally be smooth, while it will be jagged or stepped for dry bone (Symes et al. 2014).

6.1.6 Distinguishing Between Human Taphonomy and Violence

Physical and natural taphonomic alterations can appear similar to those caused by humans. Additionally, cultural modifications to human remains, such as cutmarks, may result from multiple processes including dismemberment, defleshing, disarticulation, and cannibalism (Smith 1997b; Loe 2008). These processes can be distinguished by examining the "frequency, location, and orientation" of the cutmarks and the association of other injuries or context (Loe 2008). By examining if the injuries are perimortem or postmortem, the timing of the injury can be determined, with perimortem injuries occurring on fresh bodies, while postmortem cutmarks were on older, decomposed bodies, most likely from within the population (Tung 2008).

However, injuries related to dismemberment and defleshing can often appear mimic those relating to violence and warfare. As seen in **Table 21**, one must review context and the mortuary practices of the culture, as well as patterns of injury to determine their etiology (Smith 1997b). Disarticulation and dismemberment often appear as cut, chop, or saw marks that are perpendicular to the long axis of the bone near articulations, while random superficial cutmarks are attributed to defleshing (Martín and Vargas 2007; Tiesler 2007; Loe 2008; Pérez et al. 2008). Cutmarks under one millimeter in width can be identified as true cutmarks, while marks over two millimeters are generally identified as chopmarks (Andrushko et al. 2005; Tung 2008). Superficial cutmarks along the crown of the skull are associated with scalping, while cutmarks on the face and/or basicranium and multiple short cutmarks over a large area are attributed to defleshing (Smith 1997b; Loe 2008). Flaying will leave cutmarks on surface of bones with a thin overlay of skin and are mainly found on the skull and sometimes the scapulae and clavicles (Martín and Vargas 2007; Tiesler 2007).

Tung (2008) argued that perimortem cutmarks can be generally attributed to violence on fresh bodies, while postmortem cutmarks are generally made on old or decomposed bodies that can often be attributed to members of the group. Generally, cutmarks that are reflective of defleshing (removal of soft tissue) and dismemberment due to mortuary processing should result in short, parallel cutmarks located around joints and sites of muscle and tendon attachment, while cutmarks that are reflected of violence or trophy-taking will be located on the crania (scalping), cutmarks near missing elements, and additional evidence of trauma (Olsen and Shipman 1994; Andrushko et al. 2005, 2010).

Table 21: Taphonomic Processes

Defect	Taphonomic Agent	Timing of Injury	Diagnostic Criteria	Mark Morphology	Mark in Cross-Section
Cutmarks: Processing	Cultural	Peri-mortem: **Fresh bone**	Numerous cutmarks near anatomical muscle and ligament attachments over much of skeleton, high frequencies of cutmarks, patterned orientation of marks	Striations in kerf walls lack uniformity, shallow marks **Untouched flake**: deeper than wide **Retouched flake**: parallel striae along shoulder	V- and wide V-shaped
Cutmarks: Violence	Cultural	Ante- or Peri-mortem: **Fresh bone**	Few cutmarks, infrequent post-cranial cutmarks, variability in location and depth (e.g. scalping, slashing), trophy taking, cranio-facial trauma	Striations in kerf walls lack uniformity, shallow marks	V- and wide V-shaped
Fracture		Peri- or Post-mortem: **Fresh bone**	Color difference, specific fracture (spiral, transverse, oblique, butterfly, etc.), radiating fractures	N/A	Smooth
Fracture		Post-mortem: **Dry bone**	No color difference, longitudinal and perpendicular cracking	N/A	Jagged, stepped
Sedimentation Marks	Physical	Post-mortem	Abiotic or biotic, marks tend to be over all bone, placement is not related to morphology of bone	Variability, marks are often shallow and irregular.	U-shaped
Weathering	Physical	Post-mortem	May have cracking, flaking, color changes based on exposure time	Cracking will be parallel to bone fiber	N/A
Rodent Gnawing	Biological	Post-mortem	No color difference, tend to be along edge of bone, random placement	Parallel rows, sometimes fan-shaped, flat-bottomed grooves	U-shaped
Carnivore Damage	Biological	Post-mortem	No color difference, parallel lines, usually on ends of bones	Long and smooth with flat bottoms, no striations on kerf walls, pits and punctures	U-shaped
Trampling	Biological	Post-mortem	Wavy trajectories, no preference in orientation	Rounded base and shoulder, oblique orientation to the axis of the bone	Wide V-shaped
Root Marks	Bioerosion	Post-mortem	No color difference, staining may appear, placement is random	Irregular in depth and width, branching pattern, shallow, meandering grooves	Rounded U-shaped
Insect Damage	Bioerosion	Post-mortem	Holes	Holes lack adhering flakes	N/A
Trowel Marks	Cultural	Post-depositional	Often color differences, no logic in placement	Straight cuts with square bases at apex	U-shaped

Adapted and modified from Olsen and Shipman (1994), Smith (1997), Pérez (2006), Eberth et al. (2007), Domínguez-Rodrigo et al. (2009), Symes et al. (2014), Knüsel and Robb (2016)

6.2 Data Collection

The interpretation of the use and meaning of fragmented and culturally modified human remains will depend specifically on the use of middle-range theory to link context, taphonomy, and visual patterning to theoretical perspectives (Knüsel and Robb 2016). For this research, the interment practices will be established for each site using the primary burial data. An establishment of patterning of the deviations will determine if remains with cutmarks or other modifications are the result of violence, mortuary processing, or other taphonomic events.

Data regarding the assemblage, including sample size, age, sex, element(s), and amount of skeletal articulation or association, was also collected. Spatial data about the assemblage was recorded, including the orientation of elements, patterns of skeletal element distribution, as well as documentation through photographs and mapping. Bone modification data, such as breakage, abrasion and corrosion, weathering, trampling and scratch marks, tooth marks, and bioerosion was also collected. Finally, the presence and type of cultural modification was also recorded, as well as any evidence of violence.

6.2.1 Osteological Data

All human remains have already been excavated and many have already been repatriated and/or reburied. Only a few specimens from the University of Iowa Office of the State Archaeologist were available for research use. For the available remains, data collection protocol followed Buikstra and Ubelaker's (1994) *Standards for Data Collection from Human Skeletal Remains* using a data collection sheet created by the author (Appendix A). Data collected by the author was compared to previously recorded data, and no inconsistencies were noted. All other

data was previously recorded from published documents and therefore the methodologies outlined below regarding osteological data collection could not be utilized.

For fragmentary human remains that were available for research, data collection followed a modified zonation method, as proposed by Mack et al. (2016). The zonation method (Knüsel and Outram 2004) breaks down remains into a series of zones, which allows for a more accurate count of MNI for commingled remains containing both human and non-human deposits, while Mack et al. (2016) modified the zonation method for use on commingled human remains by sectioning the skeleton into more easily identifiable areas based on anatomical and osteological landmarks. This method will identify the specific fragment and will allow for a calculation of the skeletal completeness.

If allowed, the bone was photographed and drawn to more easily assess the parts of the skeleton present and if they are from one or multiple individuals. The remains were then categorized by: dental, cranial, and post-cranial for analysis purposes. Postcranial remains can be further divided into long bones (or upper limb and lower limbs) and axial skeleton; and cranial can be further divided into facial bones and cranial vault. These remains will be compared to any available primary burial data from the same site to identify the "typical" burial practices for that site and to identify if the isolated, scattered, fragmentary or culturally modified human remains may belong to those individuals or came from possible outsiders.

For data that was previously collected, osteological data collection followed *Standards* for primary burial data. Non-primary human remains were recorded by province in addition to any recorded osteological data. Dental remains were excluded from analysis. As there were several differences in how fragmentary human remains were recorded and presented, deposits that contained multiple fragments were only recorded as one data point. For example, several

cranial fragments may have been located in the same pit, and these were recorded as one data point. Originally it was the goal to count each fragment; however, due to the variability in the data, this was not possible. For example, some sources listed all fragments present in each deposit, while others gave a general body region (i.e., cranial fragments). Additionally, not all sources recorded the number of fragments, and in some cases one element had clearly fragmented several times and could easily be re-fitted. For culturally modified human remains, similar variation in treatment were noted. Data treatment for culturally modified human remains consisted of counting each instance of cultural modification, even when they were in the same location. However, if fragments could be re-fitted, then only the reconstructed element was counted as a data point. Data used for this dissertation is compiled in Appendix B.

6.2.2 Provenience

Provenience data for each of these remains was recorded (e.g. type of feature, site location, etc.) to compare to other osteological, mortuary, taphonomic, and archaeological data following a contextual approach as described by Brück (1995). Inconsistencies in how researchers treated provenience data was also noted. Each \location was recorded; however, provenience data was required to be simplified to include burial, non-burial feature, surface, isolate, etc. These data were visually compared to specific burial depositional locations to identify patterns. Statistical analysis was used to identify associations and statistically significant patterns in the data.

6.2.3 Taphonomy

This research examined the presence or absence of cultural taphonomic processes in addition to the presence or absence of biological and physical taphonomic processes. When defects were encountered on the human remains, they were examined using a hand lens (10x magnification) to assess the potential processes responsible for their formation. This macroscopic examination and classification included the (i) identification of the location of the defect, (ii) width, (iii) length, (iv) position, (v) cross-sectional shape, (vi) depth, (vii) shape, (viii) lesions, (ix) orientation and trajectory of groove, and (x) terminal and differential damage, if possible.

6.2.4 Timing of Injury

The analysis included a determination of the timing of the injury for the remains that were available for examination. Sauer (1984) gives a protocol for the examination of lesions on skeletal remains for forensic cases which can be applied to archaeological and historic remains as well. Following Sauer (1984), the defect will be examined for signs of remodeling, hemorrhage reactions under the periosteum, the direction of the force based on bone displacement, the color, and other taphonomic processes. Detailed descriptions, sketches, and photographs will also be taken, if possible (Sauer 1984).

6.3 Statistical Analysis

As previously collected data represents the bulk of the data for this research, it is important to acknowledge that possible errors may be encountered. Lyman and VanPool (2009) have demonstrated some of the general errors that can occur during the collection of osteological and archaeological data, especially when using datasets recorded by multiple, different

researchers. These possible errors are categorized as blunders (gross errors), bias (systematic differences), and random variation. They demonstrate that variation within these data assemblages is expected, and thus, they recommend that the same analyst collect data at least twice to catch as many errors as possible. For human remains that were available for research use, data was collected twice on separate days to ensure accuracy. This data was also compared to previously collected data to ensure accuracy. However, this could not be completed for most of the data utilized for this dissertation, as most of the remains are no longer available for study.

6.3.1 Inter-Site Variance

To first explore the variation in the patterns of cultural modification, Kruskal-Wallis tests were used to determine if differences in cultural modification were statistically significant. The Kruskal-Wallis test is a non-parametric one-way ANOVA used to determine if there are significant differences between categorical dependent variables (sites) and categorical, independent variables by comparing rank profiles and assessing whether the sample distributions could represent the same distribution or if they are significantly different (McKight and Najab 2010:904). This test was used to compare sites for presence of cultural modification. The Kruskal-Wallis test does not identify where this significance occurs (for multiple sites), so post hoc testing using pairwise Mann-Whitney tests without Bonferroni correction were used to identify site differences.

6.3.2 Correspondence Analysis

To further address questions regarding the cultural modification of human remains at these Oneota sites, exploratory data were used to identify distribution and correspondence

patterns in the location, types of modification, and/or demographic information of the fragmented remains at both the intra- and inter-site levels. Specifically, correspondence analysis (CA) was used to determine relative associations in these patterns and to visualize them in two dimensions as a CA plot. Correspondence analysis is used as an exploratory data technique that creates a contingency table and plots each row and column in a table onto a graph (Doey and Kurta 2011:6).

From the contingency table, rows and columns are averaged, and expected values for each cell are calculated. The expected values are them subtracted from the original cell value to calculate the residual for each cell. The residuals demonstrate the association between the row and column, with larger positive numbers indicating stronger positive relationships and larger negative numbers indicating stronger negative relationships. These residuals are then graphically represented on a CA plot. Plot points that cluster near each other are more closely associated. Chi-square is calculated also from the contingency table to measure associations between categorical response and exploratory variables. However, it does not tell you if the associations are statistically significant (Doey and Kurta 2011:6).

6.3.3 Skeleton Frequency Maps

The number and type of isolated tertiary remains were recorded for each site. The elements found as on the surface or within non-burial features were plotted as a frequency map using the skeleton figure from the data collection sheets in *Standards*. This allowed a visual demonstration of which elements were most commonly found fragmented within and between sites.

6.3.4 Spatial Analysis

To examine any visible patterning to the location of culturally modified human remains at each site, a spatial analysis of the location of these remains within the site was performed. The maps of the site showing burials and/or features with human remains were visually compared to determine if any patterning could be identified. Due to limitations in the spatial data for each site, statistical analysis could not be performed to identify spatial patterning. However, as Goldstein (1981) demonstrated, dimensions of mortuary behavior, including sex and age, disposal context, and treatment of the body, should display regularities that can be identified by visual inspection.

6.4 Summary

For each step in the analysis, each site was examined individually to determine any patterning in cultural modification and fragmentation of human remains for that site location. Comparisons were then made between sites and as grouped sites using Kruskal-Wallis to enlarge sample size to attempt to locate any statistically significant patterns. Correspondence analysis was used to compare grouped sites and categorized burial data (e.g. primary, secondary, tertiary burials with and without additional cultural modifications). Patterning in isolated tertiary human remains were examined using skeleton frequency maps. Finally, the context of both isolated and culturally modified human remains was examined using site maps to identify spatial patterning for their location.

CHAPTER 7: RESULTS

7.1 Introduction

Data from the human remains used for this dissertation came from site reports and published sources. Some sites, such as in those from Iowa and Hoxie Farm, resources such as inventories and data collection sheets were also provided to and utilized by the author. However, additional materials, such as field notes and resources, were not utilized for this dissertation. Using data that was previously collected, published, and accessible was a deliberate choice by the author, a repatriation, reburial, and protection of burials in situ have led to the need to utilize previously recorded data, especially for North American bioarchaeology and mortuary archaeology. As the use of previously recorded data, especially when collected by multiple individuals, can be problematic, it was a goal of this dissertation to demonstrate the utility of those data to both re-evaluate conclusions and to answer new questions.

Six major sites were utilized for this dissertation, including Hoxie Farm and Morton Village/Norris Farms 36 in Illinois; Howard Goodhue, McKinney, and Wever in Iowa; and Tremaine in Wisconsin. The data used for this dissertation consisted of archaeological, mortuary, and osteological data from primary, secondary, and/or tertiary contexts. Although fragmented human remains were utilized for this dissertation, isolated dental remains were excluded from analysis. Age and sex demographics for each of these sites is presented in **Table 22**.

Oneota sites that met several criteria (presence of primary and/or secondary burials, an associated village site, and isolated and/or culturally modified human remains) and were available for research use were limited, so additional sites with limited burial and skeletal data were used to supplement and test any conclusions. These sites include Correctionville and Dixon in Iowa and Armstrong in Wisconsin. These sites had only a few excavated burials and/or

tertiary remains. Finally, additional data from examples of cultural modification from other Oneota sites were included to increase the sample size.

Table 22: Site Demographics for Six Oneota Sites

	Sex			Age			
	Males	**Females**	**Indeterminate**	**Adults**	**Subadults**	**Indeterminate**	**Total**
Hoxie Farm	5	10	72	54	23	10	**87**
Morton Village/ Norris Farms 36	52	63	167	106	164	12	**282**
Tremaine	12	20	88	47	35	38	**120**
Howard Goodhue	3	6	18	18	7	2	**27**
McKinney	1	3	16	13	6	1	**20**
Wever	1	0	12	10	0	3	**13**
Total	**73**	**102**	**373**	**247**	**235**	**66**	**549**

The context for the human remains ranged from primary, secondary, and multiple burials, as well as tertiary, fragmented remains and post-interment additions to existing burials (**Table 23**). Primary burials refer to individuals placed in their original interment location, while secondary burials are those that have been removed from their original context to a secondary location. Finally, tertiary contexts refer to human remains that are often fragmented, isolated, and disarticulated and are unrelated to other burial contexts.

Table 23: Context for Human Remains by Site

	Interment						Context					
	Primary	**Secondary**	**Tertiary**	**Multiple**	**Post-Interment Addition**	**Unknown**	**Burial**	**Non-Burial Feature**	**Surface**	**Isolate**	**House/ Wall Fill**	**Total**
Hoxie Farm	21	1	52	2	0	11	35	27	0	26	0	**87**
Morton Village/ Norris Farms 36	221	15	16	18	6	6	266	13	0	1	2	**282**
Tremaine	60	7	30	1	1	21	90	30	0	0	0	**120**
Howard Goodhue	5	14	8	0	0	0	19	4	1	3	0	**27**
McKinney	0	0	20	0	0	0	0	11	3	6	0	**20**
Wever	4	0	9	0	0	0	4	8	1	0	0	**13**
Total	**312**	**29**	**135**	**22**	**11**	**39**	**413**	**93**	**5**	**35**	**2**	**549**

Cultural modification, defined as an alteration to human remains, was present on multiple individuals. For this dissertation, these data included cutmarks, burning, polishing, as well as marks attributable to scalping or perimortem trauma. While most modifications occurred on tertiary human remains, some were also associated with other types of burial (**Table 24**).

Table 24: Presence of Cultural Modification by Context

	Primary Burial	Secondary Burial	Tertiary Remains	Multiple Burial	Post-Interment Addition	Unknown	Total
None	290	23	107	13	3	37	**473**
Scalping/ Perimortem Trauma	22	5	3	10	9	1	**50**
Cutmarks	0	0	6	0	0	0	**6**
Burning	0	1	11	0	0	0	**12**
Polishing	0	0	1	0	0	0	**1**
Multiple Modifications*	0	0	7	0	0	0	**7**
Total	**312**	**29**	**135**	**23**	**12**	**38**	**549**

*Some fragments displayed multiple forms of cultural modification

The goals of this dissertation were to identify any patterning in the presence of cultural modification and fragmentation of human remains at Oneota sites and attempt to link this patterning with taphonomic and cultural processes along temporal and spatial scales. As the cultural modification of human remains has also been attributed to violence by some researchers, another goal of this dissertation was to include any osteological data that is suggestive of violence, such as seen in scalping and perimortem trauma. By including this data, associations between violence and other cultural modifications can be evaluated and cultural modifications can be attributed (or excluded) as a form of violence.

Several types of analyses were performed to examine each research question specifically. Tertiary remains were examined using frequency maps on skeletal drawings to demonstrate the relative number of elements that were present as surface or isolated remains (Research Question 2). In order to examine any patterning in tertiary remains, cultural modification, and violence, sites were first compared using Kruskal-Wallis in order to identify sites similar in their

composition so that they could be pooled for additional analysis. Allow this decreased the number of sites, it increased the sample size of each group.

As contextual and spatial data was not present for each site used, limited analyses were performed to examine patterning in location of fragmented and culturally modified human remains (Research Question 3). Statistical analysis included correspondence analysis in order to identify associations between type of cultural modification and context.

When available, site maps were utilized to plot where primary and other human remains were located in relation to each other. As not all maps were explicit in labeling and not all data included spatial data, specific data points often could not be mapped, especially for surface and isolated finds. Non-burial features and primary interments that were mapped were included and a spatial analysis of any general noticeable patterning was performed (Research Question 4).

Finally, as violence has been used as an explanation for fragmented and culturally modified human remains, instances of scalping and perimortem violence were included in the analysis (Research Question 5). When cutmarks were encountered in the literature, many researchers attempted to reconstruct the cause, either as dismember, cutmarks, or decorative incising. As the use of previously recorded data precluded the re-analysis of cutmarks, these designations remained.

Although culturally modified human remains have often been excluded from osteological and mortuary analyses, more recent works (e.g. Hargrave et al. 2015) have devoted more time to examining cultural modification. However, they often focus exclusively on the culturally modified remains and have only included those modifications that show an alteration to the bone itself, by processes such as cutting, burning, use-wear, or by modifying them into different forms such as pipestems or gorgets. However, cultural modification of bone can be more largely

defined to include any human modification to bone, including isolated remains that are found in tertiary contexts. This dissertation used this larger, more inclusive definition of cultural modification, as well as any non-culturally modified human remains, in analysis to avoid focusing on a narrow subsection of the Oneota mortuary program.

7.2 Research Question 1: Using Previously Collected Data

The first goal of this dissertation was to evaluate if previously collected "old data" could be utilized for research specifically identifying patterns in the treatment of human remains by the Oneota. As mortuary sites are now avoided during archaeological investigations or various limitations imposed, new bioarchaeological and osteological data are scant. However, previously collected data from mortuary sites and human remains that have been repatriated or reburied are still available for research use.

For her dissertation, Kendell (2016) examined violence among the Arikara using previously collected data from the Smithsonian Institute. She found that the database used was accessible and allowed for consistent recording methods for osteological data. However, she did find a lack of standardization in photographs and radiological images, as well as archaeological and mortuary data (Kendell 2016). This research encountered similar and additional issues. A major obstacle for this research was finding Oneota archaeological sites that also had contextual data for the human remains. Although standards in skeletal data collection have been developed, no such standards exist for the collection of data from mortuary or archaeological sites containing human remains. Many sites, including Diamond Bluff and Karow in Wisconsin and Bryan and Vosburg in Minnesota, were all eliminated from this research due to the lack of contextual data for the recovered human remains.

For sites that did contain contextual data for burials and fragmented and/or culturally modified human remains, comparison of data still encountered problems. Primarily, this was noticed in how non-burial features were categorized. These features ranged in designation from features, cache pits, storage pits, hearths, etc. and some names appeared interchangeable, with no clear definitions for their usage. Due to this, only a broad category of non-burial features could be used to describe these locations.

Another difficulty for this research was inconsistent recording and data management between research institutions. Although Kendell (2016) used a large dataset that was collected by multiple individuals over a large period of time, it was only from one institution, which made procedures similar between individuals and decreased inter-observer error. This research examined multiple sites that were collected at multiple institutions. Data from these sites was all collected after the development of *Standards*; however, as previously mentioned, there currently are no standards for collecting data from tertiary human remains. This made some comparisons between institutions difficult or impossible.

7.2.1 Summary of Previously Collected Data

Although inconsistencies between data collection and recordation between institutions were encountered, data analysis for multiple sites across the Midwest was still possible. Sites used for this dissertation had both excavated burials and the presence of fragmented and/or culturally modified human remains. This included six sites in Iowa, Illinois, and Wisconsin. Due to limited sample size, additional sites that contained instances of cultural modification with only a few to no burials were also included to increase sample size.

7.3 Research Question 2: Isolated Tertiary Human Remains

The fragmentation of human remains is a common occurrence at Oneota sites across the Midwest, yet it is still a poorly understood phenomenon. Unfortunately, the lack of standardized data on recording the presence of fragmented and isolated human remains impeded many possible statistical analyses. Thus, the number of fragmented elements per site is presented as a frequency map using *Standards'* skeleton recording form to demonstrate the number and type of element most commonly found at each site.

7.3.1 Hoxie Farm

In addition to burials located at the Hoxie Farm site in Illinois, isolated and fragmentary human remains were also found. Both cranial and postcranial human remains were found in non-burial features. In **Figure 28**, the skeleton shows the isolated human remains found at the Hoxie Farm site. Only cranial, clavicle, tibia, and femur fragments were recovered from non-burial features at the site. No recovered elements were recorded from the site surface.

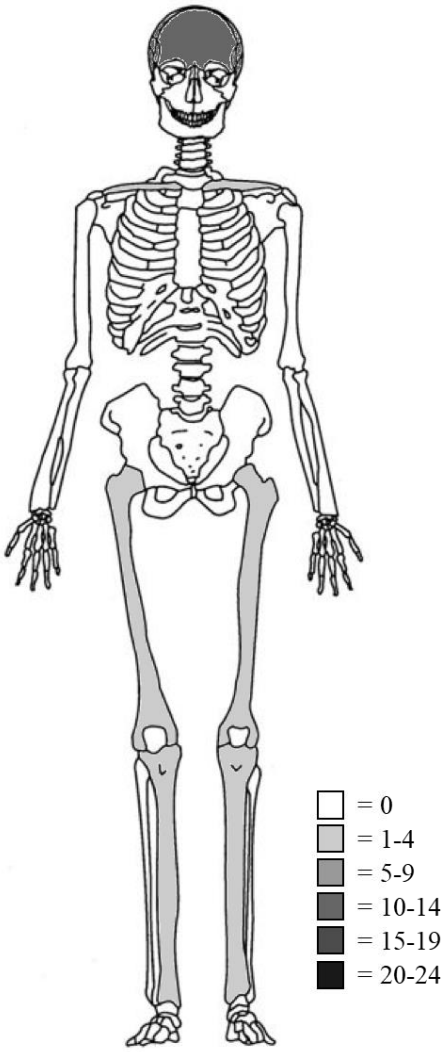

Figure 28: Hoxie Farm Isolated Human Remains

7.3.2 Morton Village and Norris Farms 36 Cemetery

Isolated human remains were found at the Morton Village site in central Illinois during recent excavations. Both cranial and postcranial human remains were found in non-burial features. In **Figure 29**, the skeleton shows the isolated human remains found at the Morton Village site. Only cranial, tarsal, tibia, and femur fragments were recovered from non-burial features at the site. No elements were recorded as being recovered from the site surface.

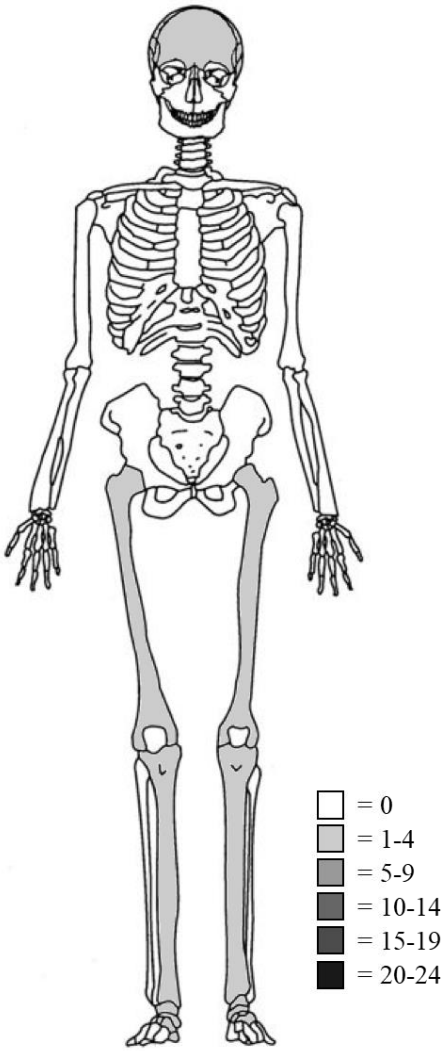

Figure 29: Morton Village and Norris Farms 36 Cemetery Isolated Remains

7.3.3 Howard Goodhue

The Howard Goodhue site located in central Iowa had multiple primary and secondary burials present. Only isolated human remains found in non-burial features were included in counts of fragmented elements. In **Figure 30**, the skeleton shows the fragmented human remains found at the Howard Goodhue site. Only cranial and facial fragments were recovered from non-burial features at the site. No elements were recorded as being recovered from the site surface.

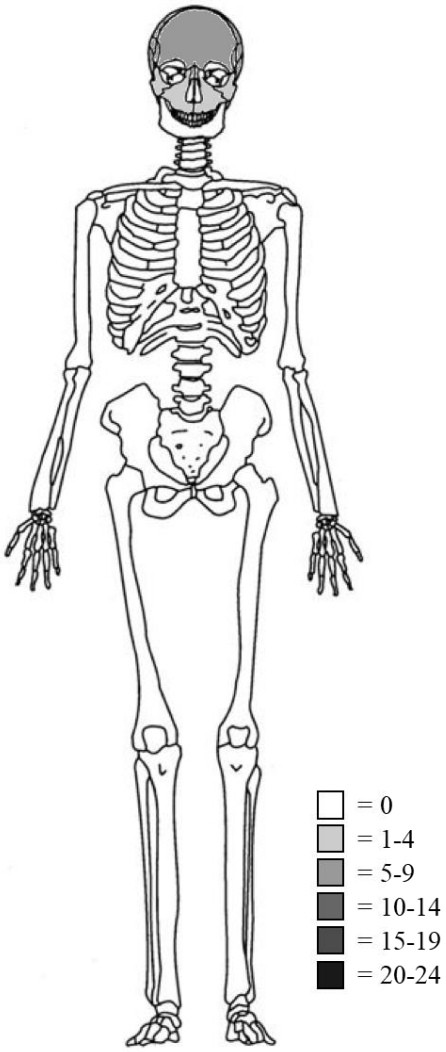

Figure 30: Howard Goodhue Isolated Human Remains

7.3.4 McKinney

Fragmented human remains at the McKinney site in southeastern Iowa were found in multiple contexts, including in non-burial features, squares and test units, and on the surface and in the plowzone. The fragmented human remains consisted of cranial and mandibular remains. Vertebrae, scapulae, humeri, femora, tibiae, and facial fragments were also recovered. In **Figure 31**, the left skeleton shows the fragmented human remains found at the McKinney site and the skeleton on the right shows the subset of those that were found on the surface. A mix of cranial and femoral fragments were recovered from the surface of the site.

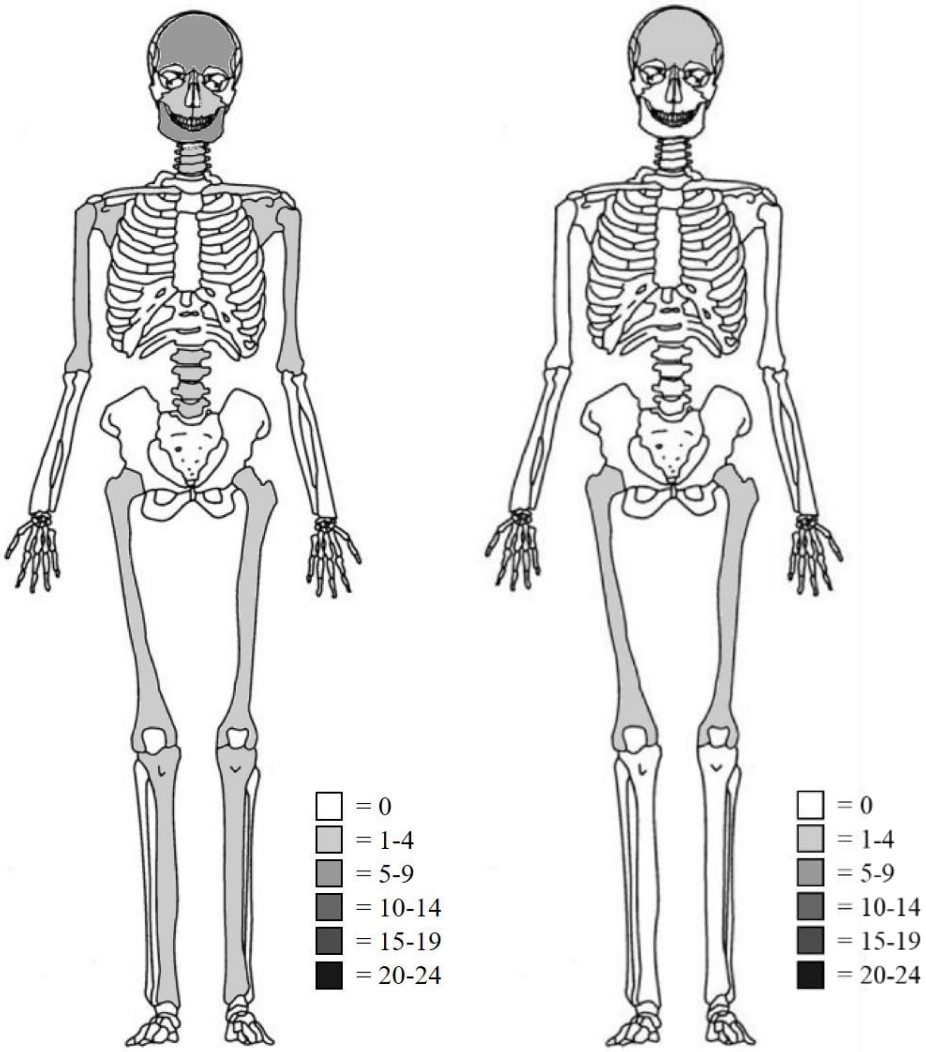

Figure 31: McKinney Isolated Human Remains: All Tertiary Remains (left) and Tertiary Remains Found on the Site Surface (right)

7.3.5 Wever

Fragmented human remains at the Wever site in southeastern Iowa were found in multiple contexts, including in non-burial features, trenches and test units, and on the surface. The fragmented human remains consisted mostly of cranial remains. Some femur, vertebra, mandible, and metatarsal fragments were also recovered. In **Figure 32**, the left skeleton shows the fragmented human remains found at the Wever site and the skeleton on the right shows the

subset of those that were found on the surface. Only vertebral fragments were recovered from the surface of the site.

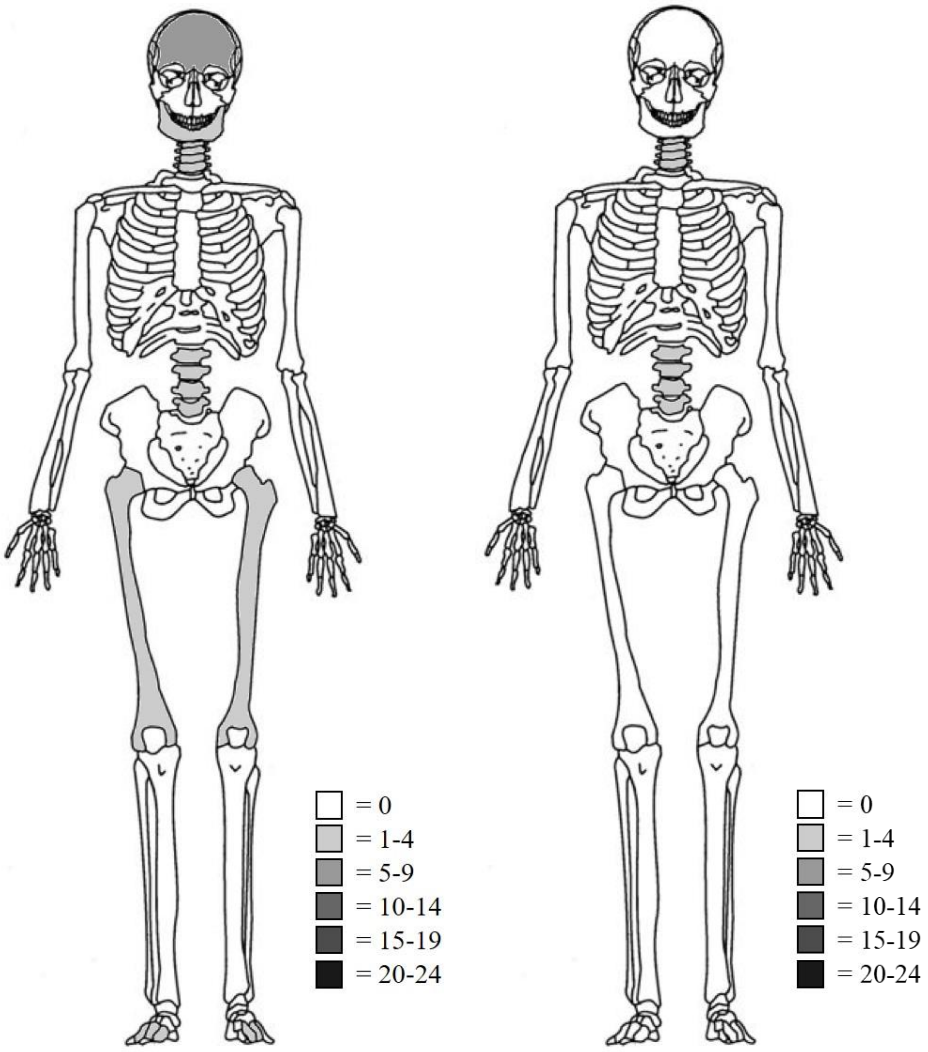

Figure 32: Wever Isolated Human Remains: All Tertiary Remains (left) and Tertiary Remains Found on the Site Surface (right)

7.3.6 Tremaine

The Tremaine site located in southeastern Wisconsin had multiple non-primary elements recovered from the site. However, this was recorded generally as “cranial”, “vertebral”, “arms and hands”, “legs and feet”, and “multiple elements” (O’Gorman 1995:183). As each individual element was not detailed, the skeleton frequency map created also followed these categories. In

Figure 33, the skeleton shows scattered human remains found at the Tremaine site. As only general location for the remains were recorded, all isolated human remains from the Tremaine site were included in the skeleton frequency map.

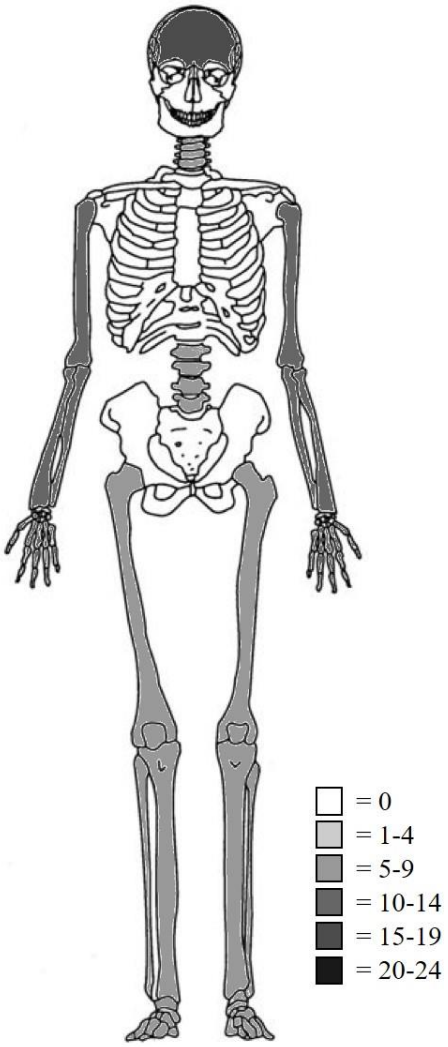

Figure 33: Tremaine Isolated Human Remains

7.4.7 Summary of Isolated Tertiary Human Remains

In addition to primary, and sometimes secondary, burials located at Oneota sites, it appears typical to find isolated human skeletal elements within the village site. Researchers have yet to identify the taphonomic processes that lead to these fragmented and scattered elements. A

goal of this dissertation was to attempt to hypothesize these processes. However, a major limitation to this goal is the lack of standardization for recording these elements. It is variable in how archaeologists report and record these remains, ranging from recording the osteological and contextual data, associating the remains with other burials but not discussing the original context, recording that isolated elements were found but not identifying the element or context, or not recording this data at all.

The skeleton frequency maps based on isolated and surface elements recovered were created for each site. The most common element recovered is cranial remains, followed by long bones, particularly femora. This pattern may be the result of femora being composed of denser bone; they may survive longer in the archaeological record as opposed to smaller and less dense elements. However, this is not the case for cranial remains. As both cranial remains and femora are the most common elements found as isolated elements and the most common that undergo cultural modification, it appears these elements are specifically selected to undergo this process.

7.4 Research Question 3: Cultural Modification

Another goal of this dissertation was to examine the osteological and mortuary data from multiple Oneota sites in the Midwest to determine if patterning could be linked to mortuary, cultural, or natural taphonomic processes. In addition, this dissertation sought to determine if this patterning could be linked to any temporal or spatial scales.

The sites used in this dissertation were limited due to multiple factors, including the requirement that sites have both burials and the presence of isolated, fragmented, and/or culturally modified human remains. **Table 25** demonstrates the general category of cultural modification by site presence. For completeness, primary burials are also shown.

Table 25: Context for Human Remains and Cultural Modification by Site

	Hoxie Farm	Morton Village/ Norris Farms 36	Tremaine	Howard Goodhue	McKinney	Wever	Total
Primary Burial	20	203	58	5	0	4	**290**
Secondary Burial	1	1	7	14	0	0	**23**
Tertiary Remains	39	16	28	6	12	6	**107**
Multiple Burial	2	10	1	0	0	0	**13**
Post-Interment Addition	0	2	1	0	0	0	**3**
Primary and Additional Modification	0	0	0	0	0	0	**0**
Primary and Trauma	1	19	2	0	0	0	**22**
Secondary and Additional Modification	0	1	0	0	0	0	**1**
Secondary and Trauma	0	6	0	0	0	0	**6**
Tertiary and Additional Modification	13	0	0	2	7	3	**25**
Tertiary and Trauma	0	0	2	0	1	0	**3**
Multiple/Post-Interment and Additional Modification	0	19	0	0	0	0	**19**
Unknown	11	5	21	0	0	0	**37**
Total	**87**	**282**	**120**	**27**	**20**	**13**	**549**

The presence of cultural modification can be defined widely. The context of the human remains was included for this dissertation, since secondary burials, tertiary remains, and post-interment additions can all be considered forms of cultural modification, in addition to burning, incising, polishing, etc.

7.4.1 Intra-Site Comparisons

To assess the presence and type of cultural modification present, within site comparisons were first made. These sites included only those that had the presence of burials, in addition to isolated, fragmented and/or culturally modified human remains.

7.4.1.1 Hoxie Farm

Hoxie Farm, located in northeastern Illinois, had multiple areas of excavated burials and features containing fragmented and/or culturally modified human remains. This included the area of the Fortified Village and multiple regions of the Main Occupation Area. A total of 87 individuals were utilized from the Hoxie Farm site (**Table 26**). This included 54 adults, 23 subadults, and ten of unknown age. Most of the adults could not be attributed a sex, primarily due to the fragmented nature of the sample.

Table 26: Location of Cultural Modification at the Hoxie Farm Site

	Cranial	Postcranial	Both Cranial and Postcranial	Total
Primary Burial	2	3	15	**20**
Secondary Burial	0	0	1	**1**
Tertiary Remains	10	23	6	**39**
Multiple Burial	2	0	0	**2**
Primary Burial and Scalping	0	0	1	**1**
Tertiary and Cutmarks	4	0	0	**4**
Tertiary and Burning	5	4	0	**9**
Unknown	0	0	0	**11**
Total	**23**	**30**	**23**	**87**

Of the 87 individuals used for this dissertation, cultural modification was present on 13 individuals displaying cutmarks or burning on tertiary, fragmented cranial and post-cranial remains. One additional individual from a primary burial had evidence of perimortem scalping.

7.4.1.2 Morton Village and Norris Farms 36 Cemetery

The site of Morton Village and the associated Norris Farms 36 cemetery, located in the Central Illinois River Valley, had both burials and fragmented human remains. Norris Farms 36 cemetery represents one of the largest skeletal collections for the Oneota and displays high frequencies of violence on the individuals interred within. The associated village site of Morton

Village does not contain any primary burials although secondary bundle burials and fragmented remains have been found.

A total of 282 individuals were utilized from both the Morton Village and Norris Farms 36 cemetery were utilized for this dissertation (**Table 27**). Most of the sample consists of individuals from the Norris Farms 36 cemetery, while only a few isolated elements were found within the Morton Village site. The sample included 164 subadults, 106 adults, and 12 of unknown age. Of the adults, 52 were male, 63 were female, and 157 could not be attributed to a sex.

Table 27: Location of Cultural Modification at the Morton Village and Norris Farms 36 Cemetery Site

	Cranial	Postcranial	Both Cranial and Postcranial	Total
Primary Burial	0	0	203	**203**
Secondary Burial	0	0	1	**1**
Tertiary Remains	2	3	11	**16**
Multiple Burial	0	0	10	**10**
Post-Interment Addition	0	0	2	**2**
Primary Burial and Scalping/Perimortem Trauma	5	0	14	**19**
Secondary Burial and Scalping/ Perimortem Trauma	2	0	3	**5**
Secondary Burial and Burning	0	1	0	**1**
Multiple Burial and Scalping/Perimortem Trauma	3	0	7	**10**
Post-Interment and Scalping/Perimortem Trauma	2	0	7	**9**
Unknown	0	0	5	**5**
Unknown and Scalping/ Perimortem Trauma	1	0	0	**1**
Total	**15**	**4**	**263**	**282**

Of the 282 individuals used for this dissertation, evidence of cultural modification consisted of tertiary remains and one burned individual that appeared to be a bundle burial at

Morton Village and evidence of perimortem trauma at Norris Farms 36. Trauma consisted of three individuals with evidence of antemortem scalping, while 13 displayed evidence of perimortem scalping and/or trauma.

7.4.1.3 Howard Goodhue

The site of Howard Goodhue, located in central Iowa, contained evidence of primary and secondary burials, as well as fragmented and culturally modified human remains (**Table 28**). A total of 27 individuals were recovered from the Howard Goodhue site. This included 7 subadults, 18 adults, and two of unknown age. Of these, three were male, six were female, and 18 could not be attributed to a sex.

Table 28: Location of Cultural Modification at the Howard Goodhue Site

	Cranial	Postcranial	Both Cranial and Postcranial	Total
Primary Burial	2	0	3	**5**
Secondary Burial	9	2	3	**14**
Tertiary Remains	5	1	0	**6**
Tertiary and Cutmarks	1	0	0	**1**
Tertiary and Burning	1	0	0	**1**
Total	**2**	**0**	**25**	**27**

Cultural modification in the form of tertiary remains, burning, and cutmarks was present at the Howard Goodhue site. Both modifications were located on cranial remains and found in non-burial features.

7.4.1.4 McKinney

The site of McKinney, located in southeastern Iowa, contained evidence of burials, as well as fragmented and culturally modified human remains. A total of 20 individuals were

recovered from the McKinney site. This included six subadults, 13 adults, and one of unknown age. Of these, one was male, three were female, and 16 could not be attributed to a sex.

Of the 20 individuals used for this dissertation, cultural modification was present in the form of tertiary cranial and postcranial remains fragmented remains (**Table 29**). Additional modifications of scalping, burning, and polishing were located on cranial remains and were found in either non-burial features or on the surface of the site. Perimortem scalping was also found on one individual.

Table 29: Location of Cultural Modification at the McKinney Site

	Cranial	Postcranial	Both Cranial and Postcranial	Total
Primary Burial	0	0	0	**0**
Secondary Burial	0	0	0	**0**
Tertiary Remains	6	5	1	**12**
Tertiary and Scalping	1	0	0	**1**
Tertiary and Burning	1	0	0	**1**
Tertiary and Polish	1	0	0	**1**
Tertiary and Multiple	5	0	0	**5**
Total	**14**	**5**	**1**	**20**

7.4.1.5 Wever

The site of Wever, located in southeastern Iowa, contained evidence of burials, as well as fragmented and culturally modified human remains. A total of 13 individuals were recovered from the Wever site. This included ten adults and three of unknown age. Of these, one was male and twelve could not be assigned to a sex.

Of the thirteen individuals used for this dissertation, cultural modifications included tertiary cranial and postcranial remains, as well as additional modifications, including the presence of cutmarks and burning (**Table 30**).

Table 30: Location of Cultural Modification at the Wever Site

	Cranial	Postcranial	Both Cranial and Postcranial	Total
Primary Burial	2	1	1	**4**
Secondary Burial	0	0	0	**0**
Tertiary Remains	2	4	0	**6**
Tertiary and Cutmarks	1	0	0	**1**
Tertiary and Multiple	2	0	0	**2**
Total	**7**	**5**	**1**	**13**

7.4.1.6 Tremaine

The site of Tremaine, located in southwestern Wisconsin, contained evidence of burials as well as fragmented and culturally modified human remains. A total of 120 individuals were recovered from the Tremaine site. This included 35 subadults, 47 adults, and 38 of unknown age. Of the adults, 12 were male, 20 were female, and 88 could not be assigned a sex.

Evidence of cultural modification at the Tremaine site consisted of fragmentary, tertiary cranial and postcranial remains (**Table 31**). Perimortem scalping was also present on four individuals, two from primary burials and two additional cases on fragmentary remains.

Table 31: Location of Cultural Modification at the Tremaine Site

	Cranial	Postcranial	Both Cranial and Postcranial	Total
Primary Burial	0	1	57	**58**
Secondary Burial	0	0	7	**7**
Multiple Burial	0	0	1	**1**
Tertiary Remains	10	10	8	**28**
Primary and Scalping	2	0	0	**2**
Tertiary and Scalping	2	0	0	**2**
Unknown	1	0	21	**22**
Total	**15**	**11**	**94**	**120**

7.4.2 Intra- and Inter-State Comparisons

Comparisons were also made between sites within the same modern state boundaries to test if the presence and/or type of cultural modification was similar based on geographical region. If similar, sites could then be pooled to increase sample size. For these comparisons Kruskal-Wallis tests were used. A statistically significant result indicates that there are significant differences between the sites in comparison, and the sites cannot be combined, while a non-significant result indicates that there are no significant differences between the sites in comparison. Two sites were compared at a time and sites with non-signification results were pooled.

Cultural modification was present at the sites used for this dissertation in Iowa and Illinois, but not in Wisconsin. Although some more recent Oneota sites in Wisconsin have evidence of cultural modification (Katherine Stevenson, personal communication, 2017), these sites were not available for research use. Additional sites in Minnesota were also originally included in the proposal for this research but were excluded due to a temporary closure of the Hamline University osteology lab and a lack of contextual information in obtained site reports.

Kruskal-Wallis was used to determine if sites could be grouped by state. However, this test only indicates that there are differences, but it does not identify where those differences lies. All six sites were compared and significant results were obtained ($p < 0.000$), which demonstrates that the sites were significantly different from each other in their composition of cultural modification.

Using the contextual data as seen in **Table 32**, the sites of Hoxie Farm and Morton Village/Norris Farms 36 contained both burials and fragmented and/or culturally modified human remains. Kruskal-Wallis and Mann-Whitney tests were used to compare the two sites.

These tests did show statistically significant differences for the presence of cultural modification ($p < 0.000$). As significant differences are present, this suggests that the two sites are not similar enough to combine into one sample.

Table 32: Context for Human Remains and Cultural Modification by Site

	Hoxie Farm	Morton Village/ Norris Farms 36	Tremaine	Howard Goodhue	McKinney	Wever	Total
Primary Burial	20	203	58	5	0	4	**290**
Secondary Burial	1	1	7	14	0	0	**23**
Tertiary Remains	39	16	28	6	12	6	**107**
Multiple Burial	2	10	1	0	0	0	**13**
Post-Interment Addition	0	2	1	0	0	0	**3**
Primary and Additional Modification	0	0	0	0	0	0	**0**
Primary and Trauma	1	19	2	0	0	0	**22**
Secondary and Additional Modification	0	1	0	0	0	0	**1**
Secondary and Trauma	0	6	0	0	0	0	**6**
Tertiary and Additional Modification	13	0	0	2	7	3	**25**
Tertiary and Trauma	0	0	2	0	1	0	**3**
Multiple/Post-Interment and Additional Modification	0	19	0	0	0	0	**19**
Unknown	11	5	21	0	0	0	**37**
Total	**87**	**282**	**120**	**27**	**20**	**13**	**549**

All three sites in Iowa (Howard Goodhue, McKinney, and Wever) were compared to each other individually using Kruskal-Wallis. All obtained non-significant results ($p < 0.512$), and therefore were grouped together. Another non-significant result was obtained using Kruskal-Wallis and Mann-Whitney tests when comparing the sites of Hoxie Farm and Tremaine ($p < 0.252$), again suggesting these sites had a similar composition in cultural modification.

These tests resulted in groupings of Iowa sites (Howard Goodhue, McKinney, and Wever); Hoxie Farm and Tremaine; and Morton Village/Norris Farms 36. Although the three sites in Iowa are from different locales and phases within Oneota, the presence of cultural modification, especially in multiple forms, is probably what led to their grouping. Additionally, Iowa Oneota occurs later than sites in both Wisconsin and Illinois, and thus their grouping follows this as well. The cemetery at Norris Farms 36 and the high number of primary burials probably led to Morton Village/Norris Farm 36 being dissimilar from the make-up of other sites. Finally, although Hoxie Farm and Tremaine are from different regions and Hoxie Farm had a higher number of tertiary remains, both contained within-structure burials and tertiary remains which probably led to their grouping.

7.4.3 Cultural Modification for All Sites

Cultural modification, defined as a post-mortem alteration to human remains, was found at a majority of the sites used for this dissertation. These modifications included tertiary remains, as well as burning, peri- and postmortem cutmarks, and polishing (**Table 33**).

Table 33: Cultural Modification and Context for Combined Sample

	Primary	Secondary	Tertiary	Multiple	Post-Interment Addition	Unknown	Total
None	290	23	107	13	3	37	**473**
Scalping/ Perimortem Trauma	22	5	3	10	9	1	**50**
Cutmarks	0	0	6	0	0	0	**6**
Burning	0	1	11	0	0	0	**12**
Polishing	0	0	1	0	0	0	**1**
Multiple Modifications*	0	0	7	0	0	0	**7**
Total	**312**	**29**	**135**	**23**	**12**	**38**	**549**

*Some elements displayed more than one type of cultural modification

The majority of cultural modification occurred on cranial remains (**Table 34**). Four postmortem alterations were found at Hoxie Farm, which primarily were burned femoral heads. Morton Village also contained one instance of a bundle burial that had been burned. Cutmarks were the primary cultural modification found. However, cutmarks found on isolated fragmentary remains can often be difficult to classify. Some incidents were determined to be incising, in which cutmarks had a patterning or design. Dismemberment cutmarks were classified based on their location, near muscle and ligament attachments. Scalping was defined based on long, horizontal singular or few cutmark(s) located on the frontal and parietal bones. Of note, three burials from Norris Farms 36 displayed evidence of healed scalping wounds, and these were not included in the cultural modification data. Perimortem scalping was also not considered to be cultural modification but was included in the analysis as a separate category to help demonstrate any possible links between cultural modification and violence.

Table 34: Location of Cultural Modification for Combined Sample

	Cranial	Postcranial	Both Cranial and Postcranial	Total
Primary Burial	7	4	279	**290**
Secondary Burial	9	2	12	**23**
Tertiary Remains	35	46	26	**107**
Multiple Burial	2	0	11	**13**
Post-Interment Addition	0	0	3	**3**
Unknown	4	1	32	**37**
Primary and Additional Modification	0	0	0	**0**
Primary and Perimortem Trauma	3	14	5	**22**
Secondary and Additional Modification	0	0	1	**1**
Secondary and Perimortem Trauma	1	3	1	**5**
Tertiary and Additional Modification	21	4	0	**25**
Tertiary and Perimortem Trauma	3	0	0	**3**
Multiple/Post-Interment and Additional Modification	0	0	0	**0**
Multiple/Post-Interment and Perimortem Trauma	0	14	5	**19**
Unknown and Perimortem Trauma	1	0	0	**1**
Total	**86**	**88**	**375**	**549**

When examining additional modifications, excluding those attributed to violence or trauma, similar results were obtained in that cranial remains were more commonly modified. A chi-square analysis was performed examining modifications present on cranial and postcranial remains and was found to be significant (χ^2=43.736, df=1, p <0.000).

7.4.3.1 Type of Cultural Modification

Correspondence analysis was performed to visualize any possible patterns in cultural modification. Grouped sites were used, as well as the presence and type of cultural modification (**Table 35**).

Table 35: Presence of Cultural Modification by Grouped Sites

	Iowa Sites (Howard Goodhue, McKinney, Wever)	Hoxie Farm, Tremaine	Morton Village/ Norris Farms 36	Total
Primary Burial	9	78	203	**290**
Secondary Burial	14	8	1	**23**
Tertiary Remains	24	67	16	**107**
Multiple Burial	0	3	10	**13**
Post-Interment Addition	0	1	2	**3**
Unknown	0	32	5	**37**
Primary and Additional Modification	0	0	0	**0**
Primary and Perimortem Trauma	0	3	19	**22**
Secondary and Additional Modification	0	0	1	**1**
Secondary and Perimortem Trauma	0	0	5	**5**
Tertiary and Additional Modification	12	13	0	**25**
Tertiary and Perimortem Trauma	1	2	0	**3**
Multiple/Post-Interment and Additional Modification	0	0	0	**0**
Multiple/Post-Interment and Perimortem Trauma	0	0	19	**19**
Unknown and Perimortem Trauma	0	0	1	**1**
Total	**60**	**207**	**282**	**549**

Correspondence analysis was used to examine the type of cultural modification present at each of the grouped sites. The biplot in **Figure 34** shows the grouped sites and their relationship to the context for all data used. The biplot displays two dimensions – grouped sites and type of cultural modification and context – on both axes. As demonstrated, the biplot accounts for 100% of the variation within the sample.

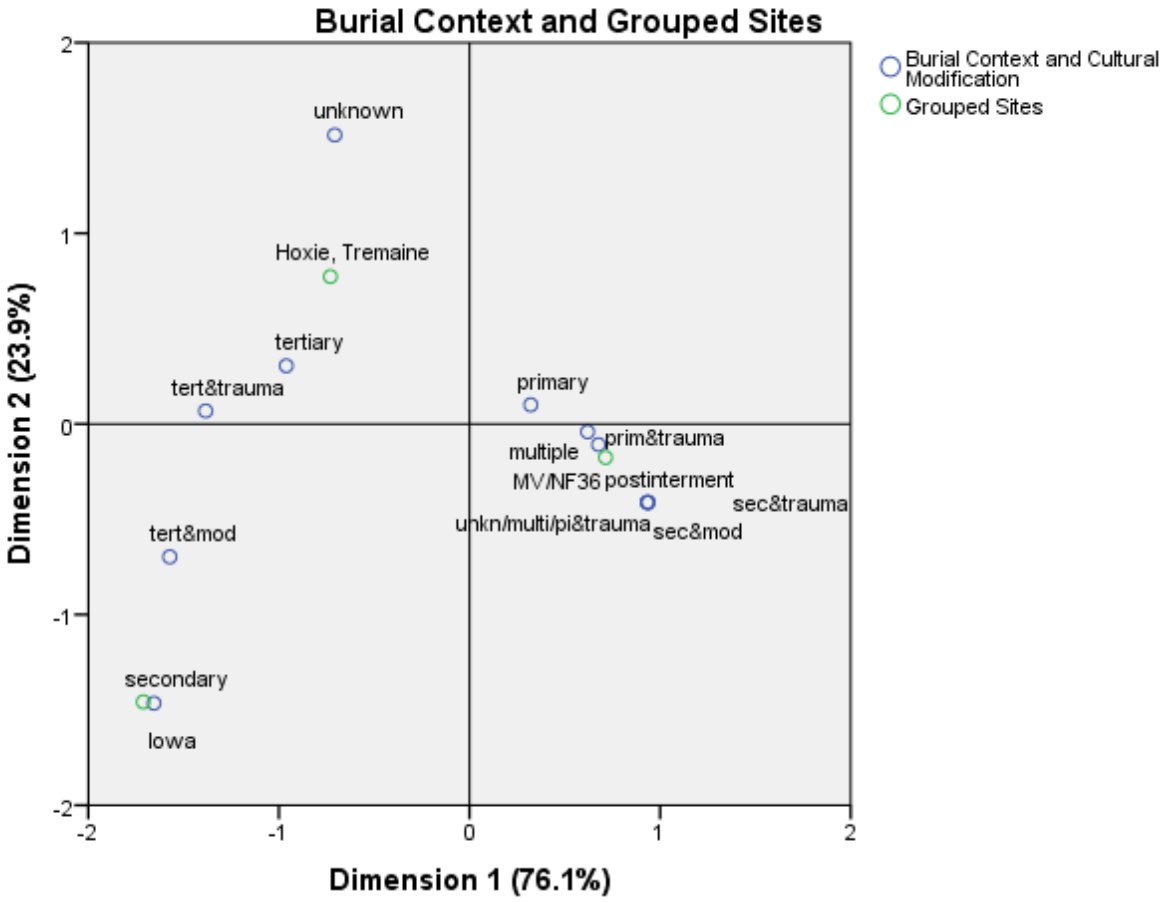

Figure 34: Correspondence Analysis for Burial Context, Cultural Modification, and Grouped Sites

The biplot resulting from correspondence analysis shows two major groupings. One is the association of secondary burials with the sites located in Iowa. This is most likely reflective of the data itself, in which there are very few secondary burials in the entire sample, most of which

are from the Howard Goodhue site in Iowa. Morton Village and Norris Farms 36 are associated with primary and multiple burials and post-interments, as well as primary, secondary, and multiple burials with evidence of trauma. Tertiary remains are close to the groupings of the Hoxie Farm and Tremaine sites. As the previous biplot only examined broad categories, each specific type of modification was used following **Table 36** to gain more detail.

Table 36: Presence and Type of Cultural Modification by Grouped Sites

	Iowa Sites (Howard Goodhue, McKinney, Wever)	Hoxie Farm, Tremaine	Morton Village/ Norris Farms 36	Total
Primary Burial	9	78	203	**290**
Secondary Burial	14	8	1	**23**
Tertiary Remains	24	67	16	**107**
Multiple Burial	0	3	10	**13**
Post-Interment Addition	0	1	2	**3**
Unknown	0	32	5	**37**
Primary and Additional Modification	0	0	0	**0**
Primary and Perimortem Trauma	0	3	19	**22**
Secondary and Burning	0	0	1	**1**
Secondary and Perimortem Trauma	0	0	5	**5**
Tertiary and Burning	2	9	0	**11**
Tertiary and Cutmarks	2	4	0	**6**
Tertiary and Polish	1	0	0	**1**
Tertiary, Burning, Polishing	1	0	0	**1**
Tertiary, Burning, Cutmarks	3	0	0	**3**
Tertiary, Cutmarks, Polishing	1	0	0	**1**
Tertiary, Burning, Cutmarks, Polishing	2	0	0	**2**
Tertiary and Perimortem Trauma	1	2	0	**3**
Multiple/Post-Interment and Additional Modification	0	0	0	**0**
Multiple/Post-Interment and Perimortem Trauma	0	0	19	**19**
Unknown Context and Perimortem Trauma	0	0	1	**1**
Total	**60**	**207**	**282**	**548**

A biplot from this data was also generated, which demonstrates more specific clustering of the data (**Figure 35**). The biplot displays two dimensions – grouped sites and type of cultural modification and context – on both axes. As demonstrated, the biplot accounts for 100% of the variation within the sample.

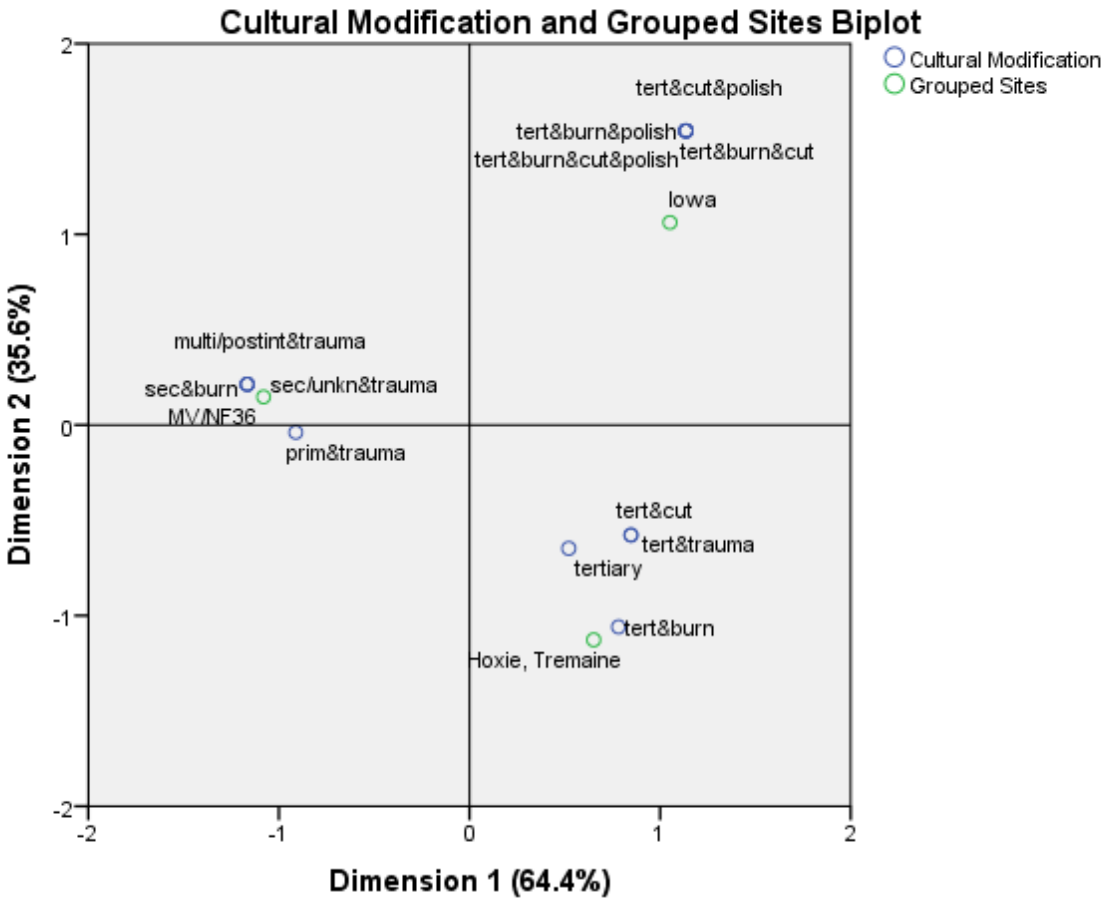

Figure 35: Correspondence Analysis for Cultural Modification and Grouped Sites

The Iowa sites of McKinney, Howard Goodhue, and Wever appear to be associated most closely with tertiary remains that display combinations of burning, polishing, dismemberment, and cutmarks. Hoxie Farm and Tremaine appear to be associated with tertiary remains in general, as well as those associated with cutmarks, trauma, and burning. The sites of Morton Village and

Norris Farms 36 are associated with primary, secondary, and multiple burials, as well as evidence of trauma.

7.4.3.2 Context and Type of Cultural Modification

Correspondence analysis was performed to examine depositional location and burial context. Most cultural modifications were found in non-burial features but were also found as isolated remains and on the surface. Variations in how non-burial features were described between sites prevented further distinction, such as cache, storage, or trash pit (**Table 37**).

Table 37: Presence of Cultural Modification by Depositional Context

	Burial	Non-Burial Feature	Surface	Isolate	House/ Wall Fill	Total
Primary Burial	290	0	0	0	0	**290**
Secondary Burial	23	0	0	0	0	**23**
Tertiary Remains	0	70	2	33	2	**107**
Multiple Burial	13	0	0	0	0	**13**
Post-Interment Addition	3	0	0	0	0	**3**
Unknown	37	0	0	0	0	**37**
Primary and Additional Modification	0	0	0	0	0	**0**
Primary and Perimortem Trauma	22	0	0	0	0	**22**
Secondary and Burning	1	0	0	0	0	**1**
Secondary and Perimortem Trauma	5	0	0	0	0	**5**
Tertiary and Burning	0	9	0	2	0	**11**
Tertiary and Cutmarks	0	6	0	0	0	**6**
Tertiary and Polish	0	0	1	0	0	**1**
Tertiary, Burning, Polishing	0	1	0	0	0	**1**
Tertiary, Burning, Cutmarks	0	3	0	0	0	**3**
Tertiary, Cutmarks, Polishing	0	0	1	0	0	**1**
Tertiary, Burning, Cutmarks, Polishing	0	1	1	0	0	**2**
Tertiary and Peritmortem Trauma	0	3	0	0	0	**3**
Multiple/Post-Interment and Additional Modification	0	0	0	0	0	**0**
Multiple/Post-Interment and Perimortem Trauma	19	0	0	0	0	**19**
Unknown and Perimortem Trauma	1	0	0	0	0	**1**
Total	**414**	**93**	**5**	**35**	**2**	**549**

Correspondence analysis was used to examine in what context the type of cultural modifications was found. A biplot was developed based on the type of cultural modification grouped by context at the sites (**Figure 36**). The biplot displays two dimensions – context and type of cultural modification – on both axes. As is demonstrated by the biplot, 92% of the variation within the sample is accounted for and there are three distinct groupings.

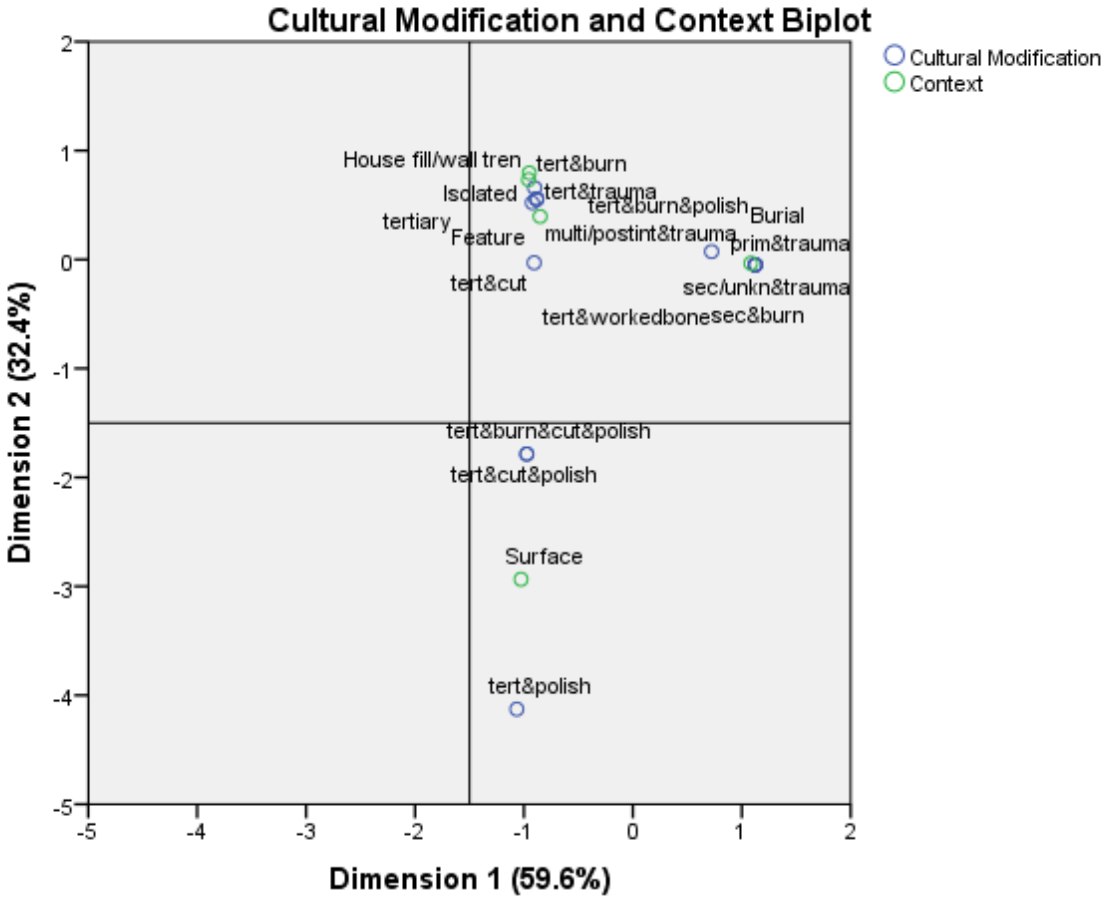

Figure 36: Correspondence Analysis for Type of Cultural Modification and Context

Two distinct groupings appear for context; burial; and non-burial features, house/wall fill, and isolated finds. There is an association between burials and the presence of scalping and other perimortem trauma. Non-burial features and isolated finds tend to be tertiary remains that display

cutmarks, burning, and other trauma. Although not tightly clustered, culturally modified remains found on the surface or in the plowzone appear to be more associated with tertiary remains that exhibit cutmarks and polishing.

7.4.4 Cultural Modification with Additional Sites

To further increase sample size, additional sites that did not have excavated burials were included. These included the sites of Dixon and Correctionville in Iowa and the site of Armstrong in Wisconsin. These sites contained limited data from mostly non-primary and culturally modified human remains. To increase sample size, additional human remains displaying cultural modification were also included in some analyses. The sites used for this dissertation that contained both burial and fragmented and/or cultural modified human remains include McKinney, Wever, and Howard Goodhue in Iowa; Morton Village, Norris Farms 36, and Hoxie Farm in Illinois; and Tremaine in Wisconsin. The additional sites of Correctionville and Dixon in Iowa and Armstrong in Wisconsin were included as sites that have fragmented and culturally modified human remains, but few to no excavated burials (**Table 38**).

Table 38: Context for Human Remains and Cultural Modification for Additional Sites

	Armstrong	Correctionville	Dixon	Total
Primary Burial	0	2	0	**2**
Secondary Burial	0	0	0	**0**
Tertiary Remains	2	5	10	**17**
Multiple Burial	0	0	0	**0**
Post-Interment Addition	0	0	0	**0**
Unknown	0	0	0	**0**
Primary and Additional Modification	0	0	0	**0**
Primary and Perimortem Trauma	0	0	0	**0**
Tertiary and Additional Modification	2	3	3	**8**
Tertiary and Perimortem Trauma	0	0	0	**0**
Total	**4**	**10**	**13**	**27**

These sites were excluded from the previous data analysis as the sites did not meet the requirement of having excavated burials. Kruskal-Wallis was used to first compare the sites of Dixon and Correctionville in Iowa and Armstrong in Wisconsin and they were found to have non-significant results for both the presence and type of cultural modification ($p < 0.457$). Due to similar composition in cultural modification, the sites were grouped, then were compared to the other three grouped "Iowa Sites" using Kruskal-Wallis and were found to have non-significance for the presence and type of cultural modification ($p < 0.221$). As five sites in Iowa and the Armstrong site in Wisconsin were found to be similar in the composition of the presence and type of cultural modification, they were again combined in further increase sample size.

7.4.4.1 Type of Cultural Modification with Additional Sites

Correspondence analysis was used to determine if including more sites would confirm the previous results of comparisons of the type of cultural modification and grouped sites (**Figure 37**). The biplot displays two dimensions – grouped sites and type of cultural modification – on both axes. As is demonstrated by the biplot, 100% of the variation within the sample is accounted for and there are three distinct groupings.

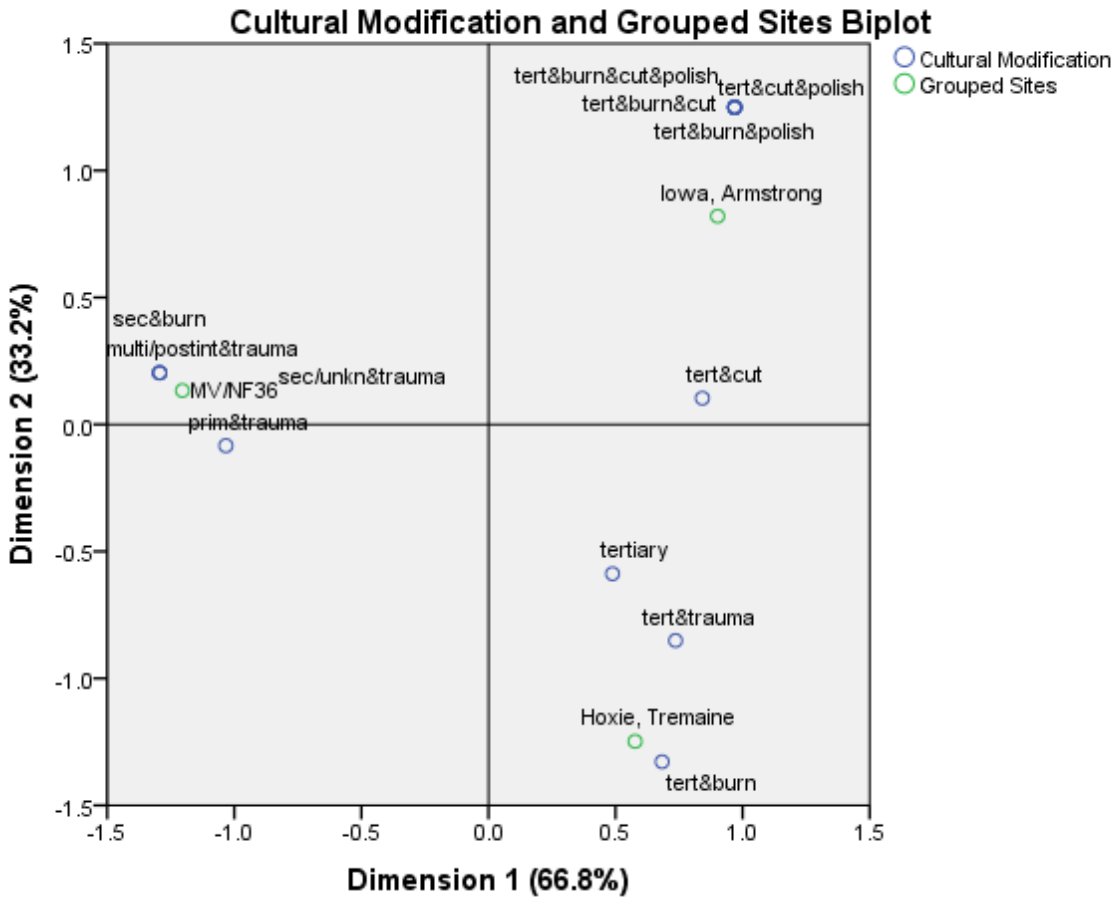

Figure 37: Correspondence Analysis for Type of Cultural Modification and Grouped Sites with Additional Sites

The biplot shows three groupings. The sites located in Iowa and the Armstrong site in Wisconsin tend to be associated with tertiary remains with multiple combinations of additional cultural modification. Hoxie Farm and Tremaine tend to be associated with tertiary remains with both violence (probably most associated with Tremaine) and burning (most associated with Hoxie Farm). Morton Village and Norris Farms 36 are mostly associated with primary, secondary, and multiple burials with trauma.

7.4.5 Cultural Modification with All Data

Data from Oneota sites containing cultural modification were excluded from analysis due to multiple reasons, including the lack of burial and non-primary skeletal data. As the sample size for this dissertation was limited based on these factors, additional sites were included in an attempt to validate the previous results. This included data from sites that only had cultural modification data or had few to limited burials. In other words, no primary or non-modified human remain data were included. This was used as an attempt to increase the cultural modification data to attempt to confirm if the patterns were correct. These sites included Anker in Illinois. The sites from Iowa were Adams County (Nodoway), Dawson, Wildcat, Lane Farm/Grant Village, Schmeiser, Blood Run, Flatiron Terrace, O'Regan Terrace, 13AM60, 13MA207, and 13MA209 in Iowa (**Table 39**).

Table 39: Context for Human Remains and Cultural Modification for Additional Data

	Anker	Adams Co.	Dawson	Wildcat	Lane Farm	Schmeiser	Blood Run	13MA207	13MA209	Flatiron Terrace	O'Regan Terrace	13AM60	Total
Primary Burial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Secondary Burial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Tertiary Remains	0	0	0	0	0	0	0	0	0	0	0	1	**1**
Multiple Burial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Post-Interment Addition	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Unknown	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Primary and Additional Modification	0	0	0	0	0	0	0	0	0	0	1	0	**1**
Primary and Perimortem Trauma	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Tertiary and Additional Modification	4	1	0	1	1	1	3	3	1	4	0	0	**19**
Tertiary and Perimortem Trauma	0	0	1	0	0	0	0	0	0	0	0	0	**1**
Total	**4**	**1**	**1**	**1**	**1**	**1**	**3**	**3**	**1**	**4**	**1**	**1**	**22**

Culturally modified human remains found at the sites of Anker in Illinois and the 11 sites in Iowa were added to increase the sample for culturally modified remains (Hedman 2015; Lillie and Schermer 2015b). The data included for the additional sites only consisted of culturally modified human or fragmented remains. Therefore, sites were again grouped to increase the sample size of comparisons. Data on the presence of cultural modification was used to categorize the groupings. Comparisons between sites were made using Kruskal-Wallace to identify non-significant results, as this demonstrates sites that are similar in composition of the presence of cultural modification. The results were five groups: 1) McKinney, Wever, Howard Goodhue, Correctionville, 2) Dixon and Armstrong; 3) Morton Village/Norris Farms 36 and Hoxie Farm; 4) Tremaine; and 5) Anker and the Iowa sites of Adams Co. Nodoway, Dawson, Wildcat, Lane Farm Grant Village, Schmeiser, Blood Run, 13MA207, 13MA209, Flatiron Terrace, O'Regan Terrace, 13AM60. Both cultural modification and scalping were present at all the grouped sites.

7.4.5.1 Type of Cultural Modification with All Data

Correspondence analysis was performed in order to visualize any possible patterns in cultural modification with the addition of the sites of Dixon and Correctionville in Iowa and Armstrong in Wisconsin in order to increase sample size. Cultural modification is present at all the grouped sites (**Table 40**).

Table 40: Context for Human Remains and Cultural Modification for Increased Sample

	Iowa, Armstrong	Hoxie Farm, Tremaine	Morton Village/ Norris Farms 36	Additional Sites	Total
Primary Burial	11	78	203	0	**292**
Secondary Burial	14	8	1	0	**23**
Tertiary Remains	41	67	16	1	**125**
Multiple Burial	0	1	10	0	**13**
Post-Interment Addition	0	1	2	0	**3**
Unknown	0	32	5	0	**37**
Primary and Additional Modification	0	0	0	1	**1**
Primary and Perimortem Trauma	0	3	19	0	**22**
Secondary and Burning	0	0	1	0	**1**
Secondary and Perimortem Trauma	0	0	5	0	**5**
Tertiary and Burning	2	9	0	2	**13**
Tertiary and Cutmarks	7	4	0	10	**21**
Tertiary and Polish	1	0	0	0	**1**
Tertiary, Burning, Polishing	1	0	0	0	**1**
Tertiary, Burning, Cutmarks	3	0	0	0	**3**
Tertiary, Cutmarks, Polishing	3	0	0	1	**4**
Tertiary, Burning, Cutmarks, Polishing	2	0	0	0	**2**
Tertiary, Worked Bone	1	0	0	6	**7**
Tertiary and Perimortem Trauma	1	2	0	1	**4**
Multiple/Post-Interment and Additional Modification	0	0	0	0	**0**
Multiple/Post-Interment and Perimortem Trauma	0	0	19	0	**19**
Unknown and Perimortem Trauma	0	0	1	0	**1**
Total	**87**	**207**	**282**	**22**	**598**

Correspondence analysis was used to determine if including more sites would confirm the previous results of comparisons of the type of cultural modification and grouped sites (**Figure 38**). The biplot displays two dimensions – grouped sites and type of cultural modification – on both axes. As is demonstrated by the biplot, 78.8% of the variation within the sample is accounted for in three distinct groupings.

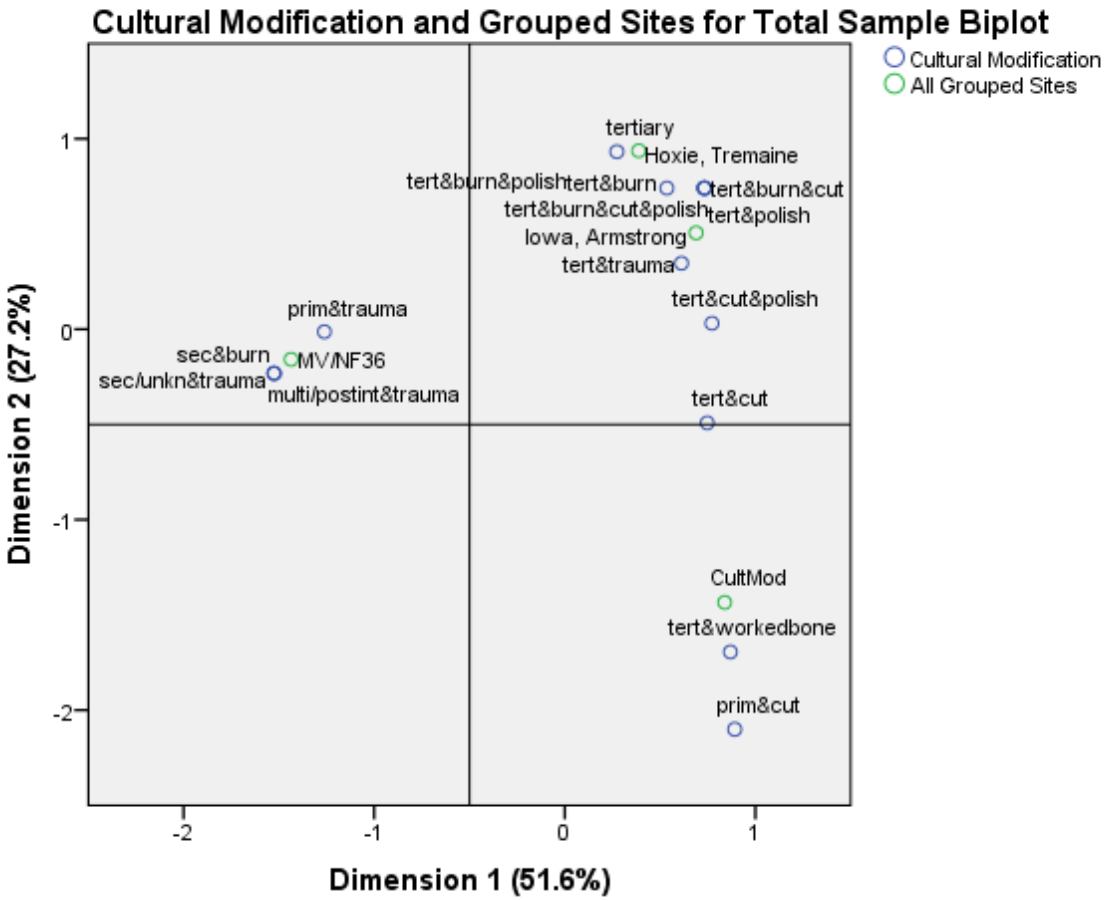

Figure 38: Correspondence Analysis for Type of Cultural Modification and Grouped Sites for Total Sample

The biplot demonstrates three major groupings. Again, Morton Village and Norris Farms 36 tend to be most associated with primary, secondary, and multiple burials with trauma. The sites of Hoxie Farm and Tremaine cluster similarly with the sites in Iowa and Armstrong, which are associated with tertiary remains, both with and without additional modification. When including the additional cultural modification data from multiple sites, these sites tend to be most associated with primary burials with cutmarks, as well as tertiary remains that have been "worked", meaning they were notched or made into pipes or rasps, for instance.

As Norris Farms 36 appears to represent an outlier in cultural modification, an additional correspondence analysis was used in order to explore if the site influenced the result of previous analyses (**Figure 39**). Similar results are obtained; however, the Armstrong site and Iowa sites and the Hoxie Farm and Tremaine site groupings have more clear associations.

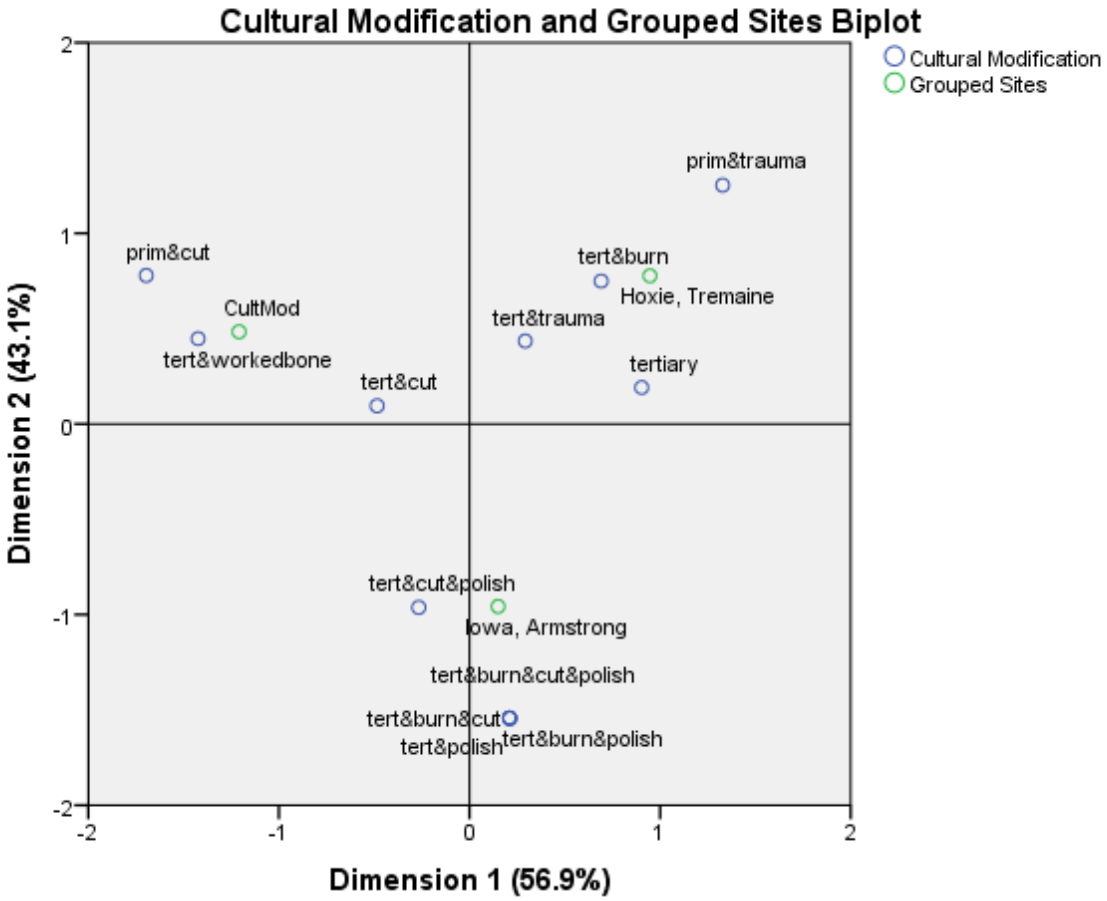

Figure 39: Correspondence Analysis for Type of Cultural Modification and Grouped Sites for Sample Excluding Morton Village and Norris Farms 36 Cemetery

7.4.6 Summary of Cultural Modification

Cultural modification found at Oneota sites used for this dissertation show evidence of burning, polishing, and cutmarks. Cultural modification is found at multiple Oneota sites across the Midwest, although certain types of modifications appear more prevalent in certain locations.

Specifically, Oneota sites located in Iowa tend to display polishing, which is not often seen in other locations. Additionally, cultural modification at Iowa sites tends to be more complex, often having more than one modification. Burning is found at many Oneota sites but tends to be most often associated with Hoxie Farm.

7.5 Research Question 4: Spatial and Temporal Analysis

Patterning regarding spatial and temporal scales in the presence and type of cultural modification of human remains at Oneota sites was also examined. Sites were examined both spatially using any available site maps. Temporal analysis could also be conducted using phases attributed to each site.

7.5.1 Spatial Analysis

Spatial analysis was used to visually compare any patterning in the location of fragmented or culturally modified human remains at the site level. More detailed spatial analysis could not be performed as GIS data points were not recorded, some areas of sites were not mapped, and many features at sites were not labeled.

7.5.1.1 Hoxie Farm

The Hoxie Farm site had undergone multiple excavations that uncovered burials and/or human remains. These occurred at the fortified village and main occupation portions of the site. At the main occupation, four separate areas were also discovered, all of which contained burials and/or isolated human remains (**Figure 40**).

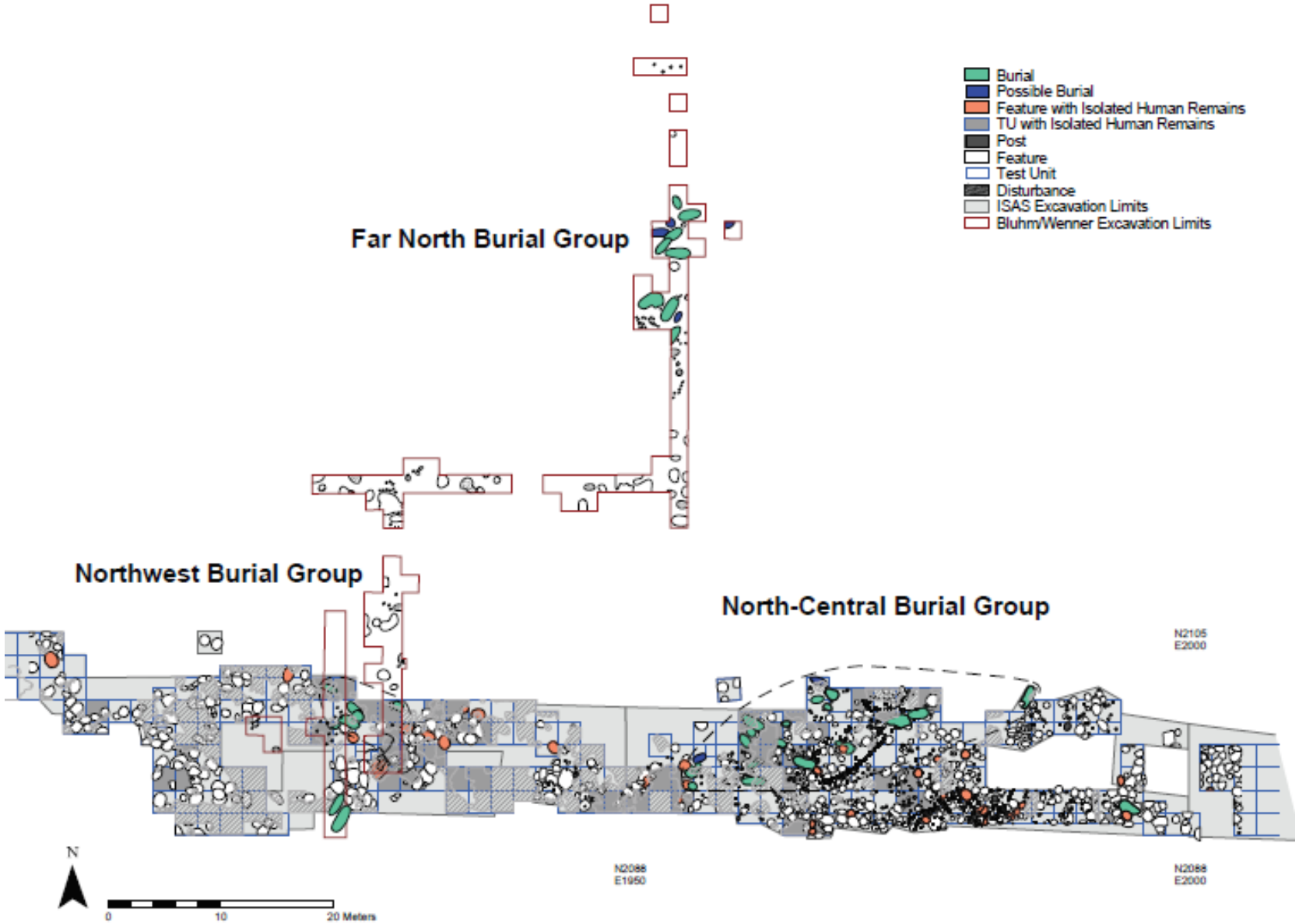

Figure 40: Burials and Human Remains from the Main Occupation Area at the Hoxie Farm Site (Hargrave et al. 2017:327)

It was noted that features containing isolated human remains were more circular and smaller in ratio than the burial pits, with most of the isolated human remains found in the north-central area (Hargrave et al. 2017:329). Hargrave et al. (2017:329) suggests that due to the high prevalence of isolated remains, it was likely that these remains were on the surface of the site during site occupation. The researchers were able to associate some of these fragmentary remains found across the site to individuals. Burials were not directly associated with any structures, although some features with isolated human remains and later Fisher burials were superimposed by a Huber phase longhouse, which may have caused some mixing of human remains (Hargrave et al. 2017:329). It appears that although burials were located within the village site, they were not associated with structures, at least at the time of their interment.

7.5.1.2 Morton Village and Norris Farms 36 Cemetery

Most of the individuals from this site came from the cemetery portion, Norris Farms 36. These individuals were interred on an accretional mound over the span of occupation. Most of the individuals who displayed violence were buried on the perimeter of the cemetery (**Figure 41**).

Figure 41: Distribution of Individuals with Evidence of Violence at the Norris Farms 36 Cemetery (Santure 1990c:157)

Isolated human remains were not located within the cemetery site but were located in some areas of the village portion, Morton Village. The isolated human remains were not discussed in the text of *Archaeological Investigations at the Morton Village and Norris Farms 36 Cemetery* by Santure et al. (1990). However, fragments of human bone were listed in tabulations of the contents of features in an appendix. These included bundle burials of infants within structures, and adult cranial and postcranial fragments found in features and wall trenches.

7.5.1.3 Howard Goodhue

The Howard Goodhue site located in central Iowa contained both primary and secondary burials, as well as isolated human remains with and without cultural modification (**Figure 42**). There are two major areas of excavation; the first done in 1965 and the second in the following year. The first major excavation uncovered multiple features, six of which contained fragmented human remains. Of these, two fragments had evidence of cultural modification.

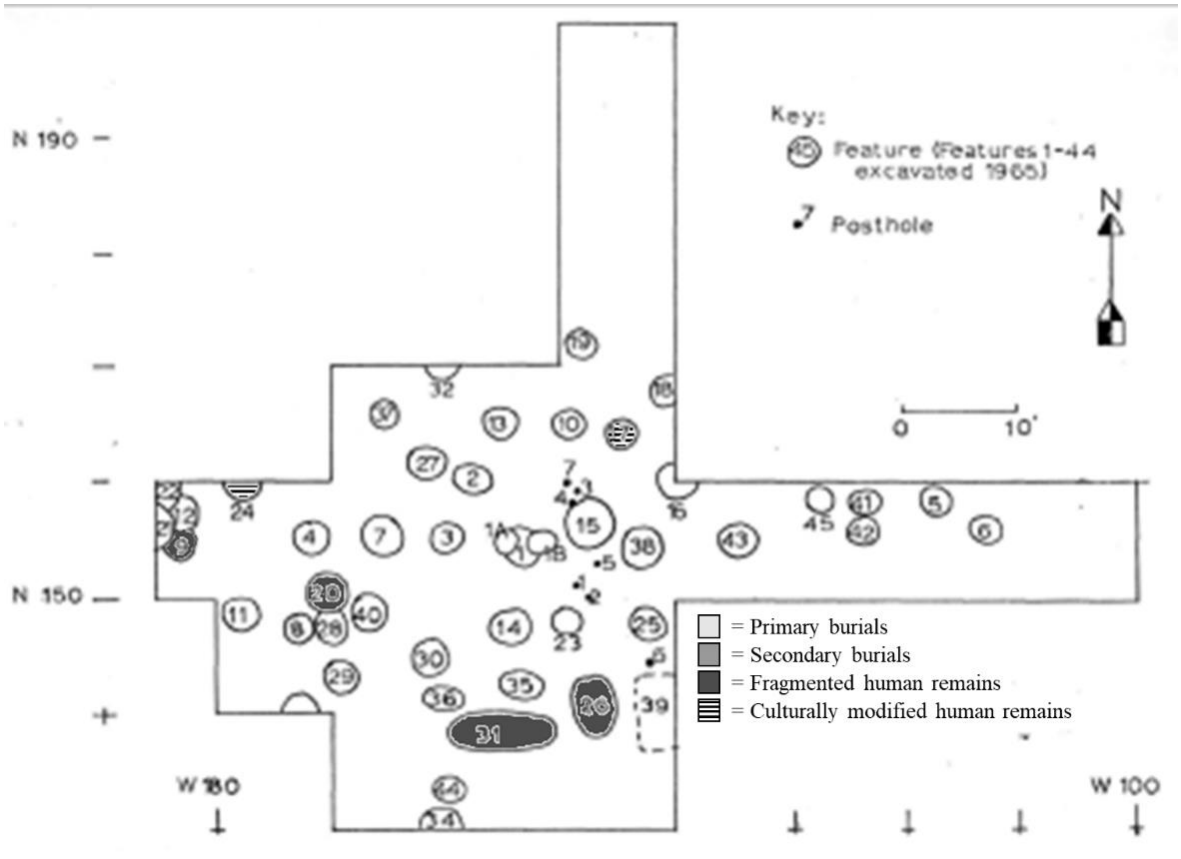

Figure 42: 1965 Excavations at the Howard Goodhue Site (modified from Gradwohl 1973:18)

The second major excavation uncovered a probable mortuary area with both primary and secondary burials (**Figure 43**). An additional non-burial feature outside of the mortuary area contained a human bone fragment.

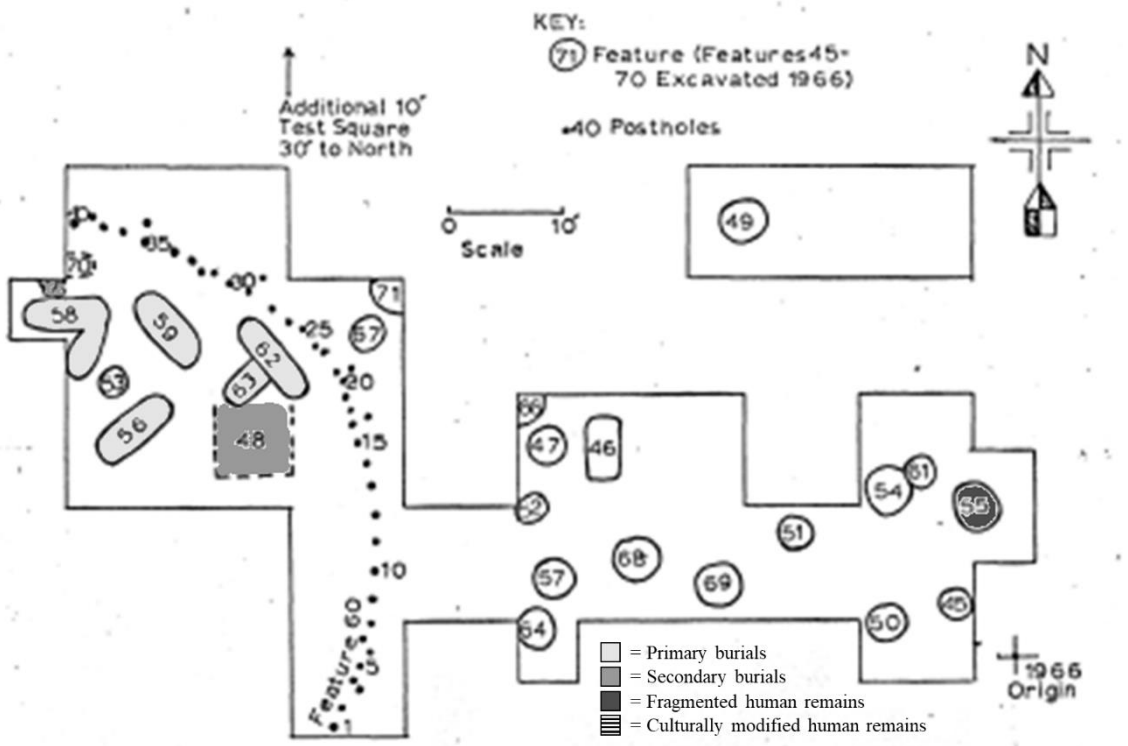

Figure 43: 1966 Excavations at the Howard Goodhue Site (modified from Gradwohl 1973:19)

The Howard Goodhue site has evidence of a distinct mortuary area that is at least partially enclosed based on the prevalence of postmolds. However, additional fragments of human remains are found outside of this area, including those that have been culturally modified.

7.5.1.4 McKinney

Excavations at the McKinney site did not find any primary burials; however, tertiary remains were found in non-burial features at the site **(Figure 44)**. Culturally modified human remains were also encountered in features at the site. However, as no village structure or mortuary areas have been encountered, their meaning and relationship to the mortuary program is less clear.

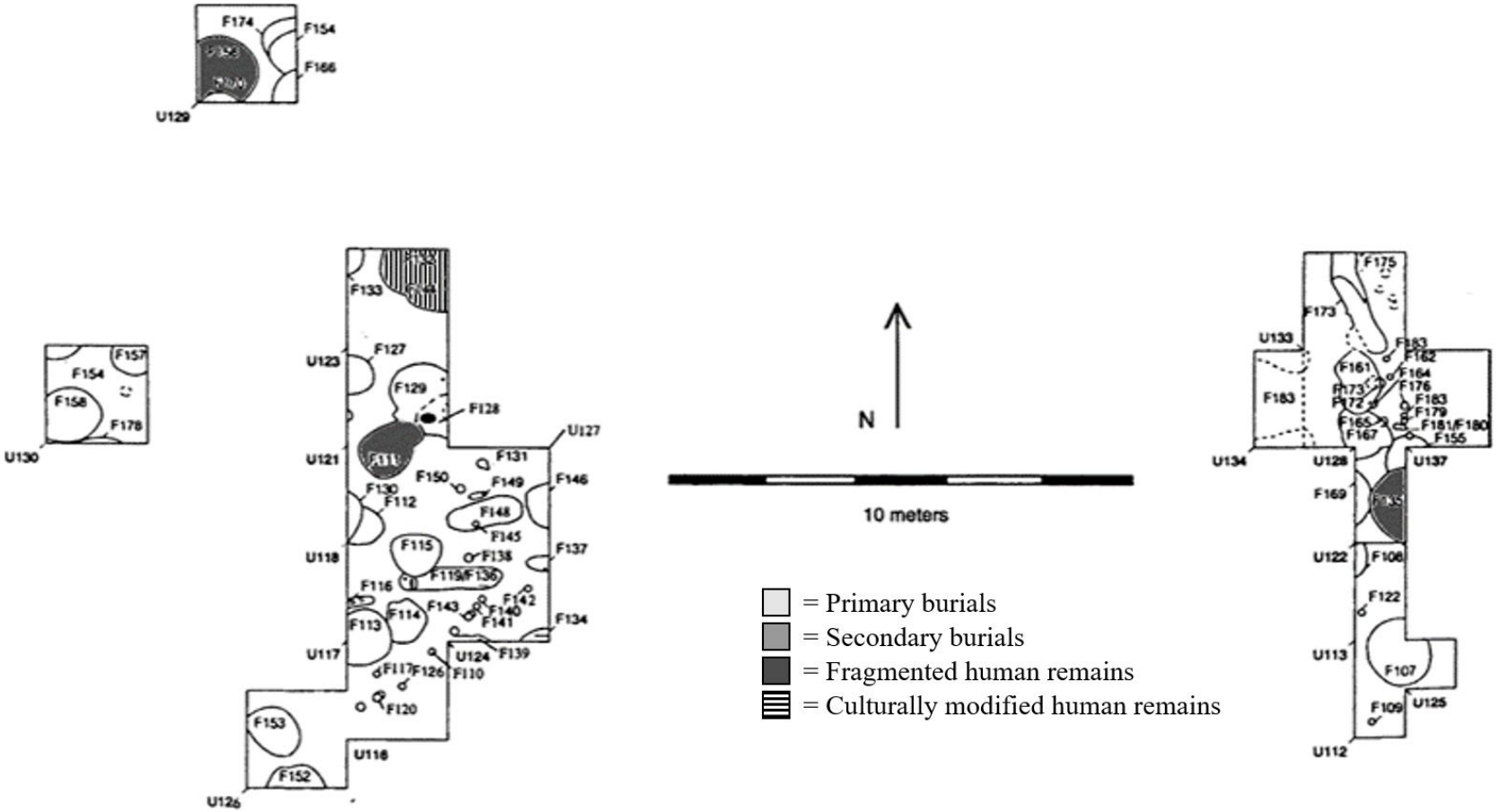

Figure 44: 1996 Excavations at the McKinney Site (adapted from Hollinger 2005)

7.5.1.5 Wever

The Wever site is located in southeastern Iowa. Excavations of the site occurred in 1992 and 1993 in which burials were found within the village portion. A separate associated cemetery located north of the Wever village was identified, but not excavated. The Wever site displays multiple forms of Oneota mortuary burial practices, with a defined separate cemetery, a probable mortuary facility, and burials located within a longhouse structure (**Figure 45**). In addition to burials, human remains were also found in non-burial features across the site, some of which were culturally modified.

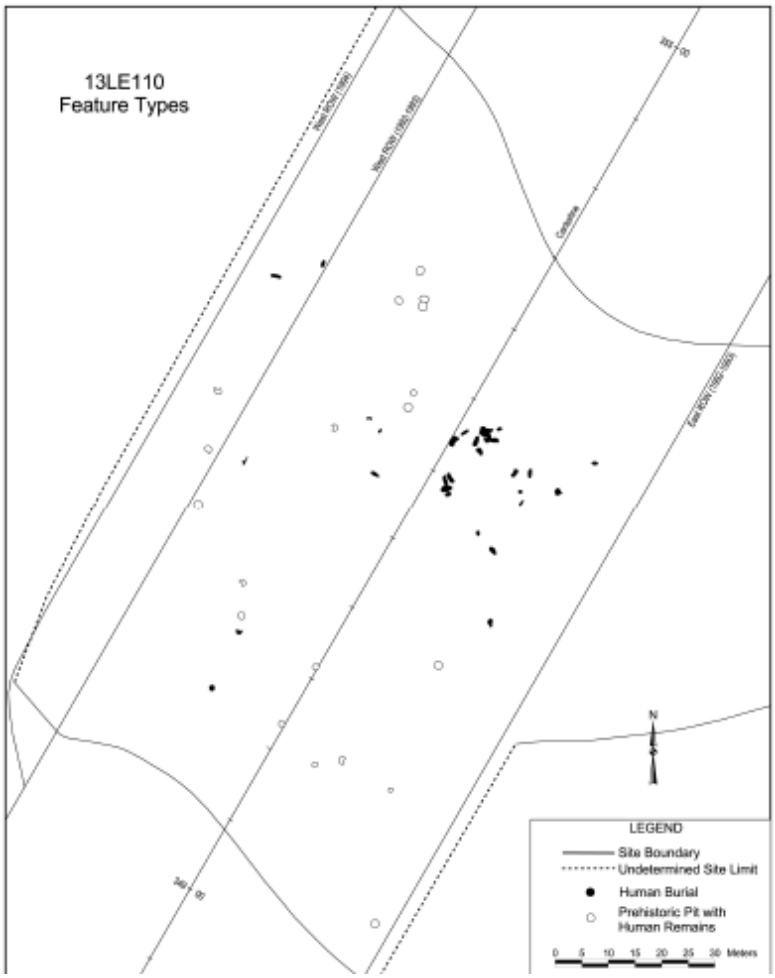

Figure 45: Burials and Features with Human Remains at the Wever Site (Withrow and Benn 2004:125)

The major cluster of burials located in the site are believed to be part of an enclosed mortuary processing facility (**Figure 46**). No culturally modified human remains were found inside of this facility.

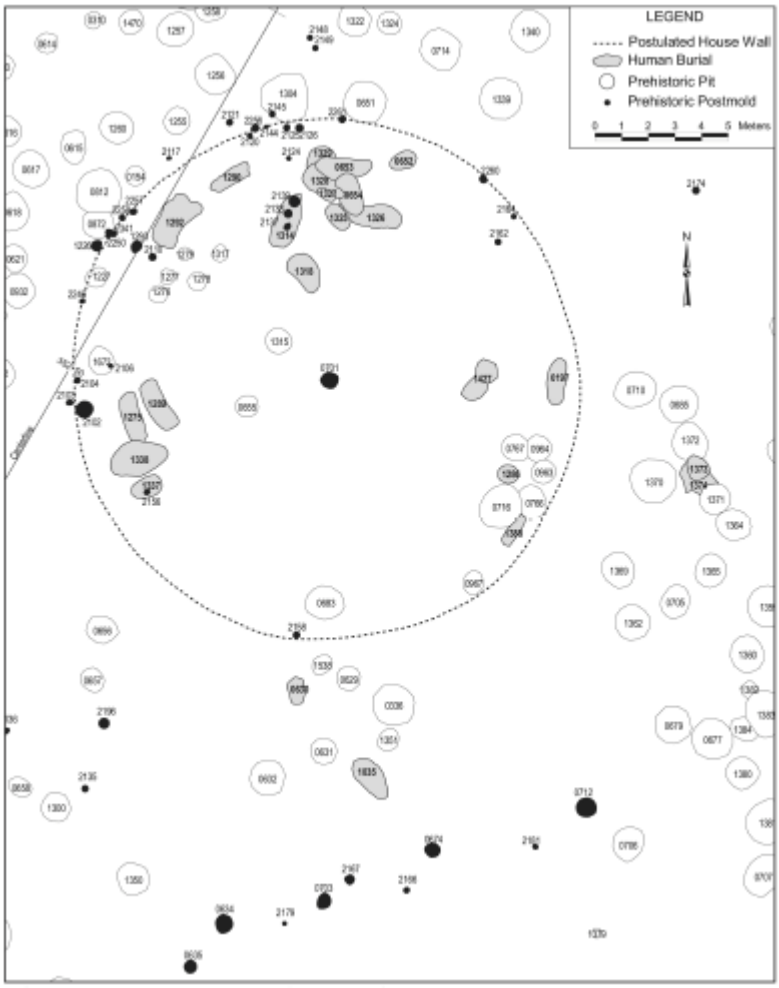

Figure 46: Proposed Mortuary Facility at the Wever Site (Withrow and Benn 2004:133)

An additional area of burials is believed to be located inside of a longhouse structure (**Figure 47**). One pit feature containing culturally modified human remains was located within or in the wall of the structure. This element was a cranial fragment that had both cutmarks and burning.

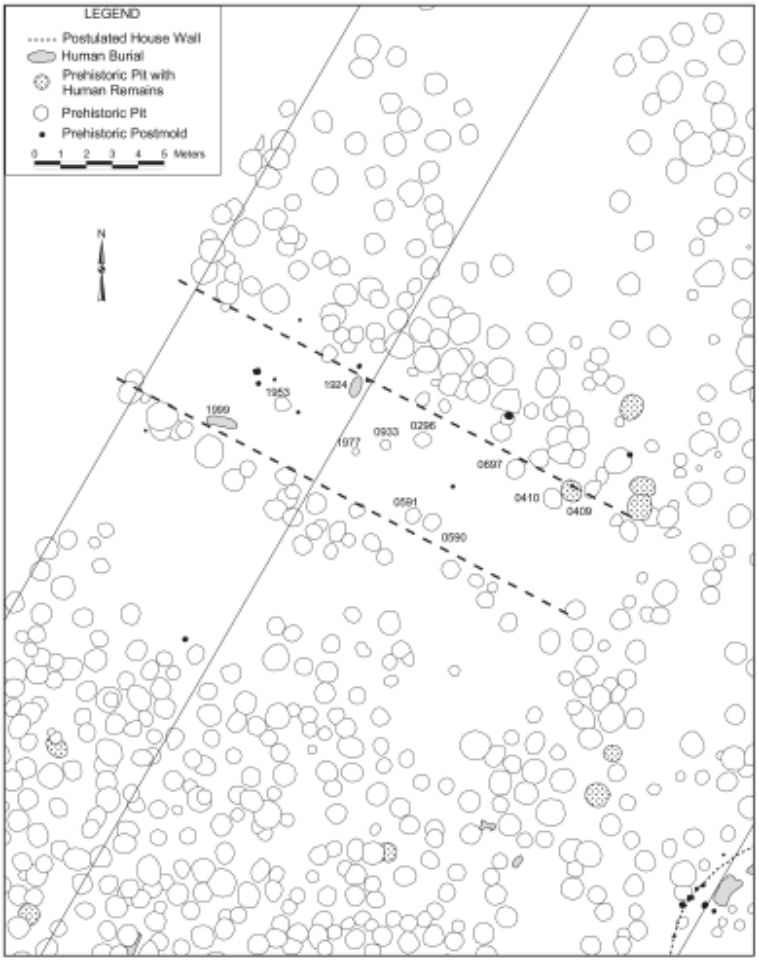

Figure 47: Proposed Longhouse at the Wever Site (Withrow and Benn 2004:134).

7.5.1.6 Tremaine

The Tremaine site contained multiple burials, as well as isolated human remains (**Figure 48**). Human burials were located exclusively in Area H of the site, while isolated human remains were found in Areas D, E, and H (O'Gorman 1995:178). The burials were primarily found to be located within the structures, suggesting an intra-household burial pattern (O'Gorman 1995). O'Gorman (1995) conducted a spatial analysis of the human burials at the Tremaine site. Clustering of graves along the walls the structure were noted in some structures. Following Goldstein (1980), these rows are suggestive of social structure, specifically family or kin units. The rows were composed of adults of both sexes, adolescents, children, and infants, suggesting

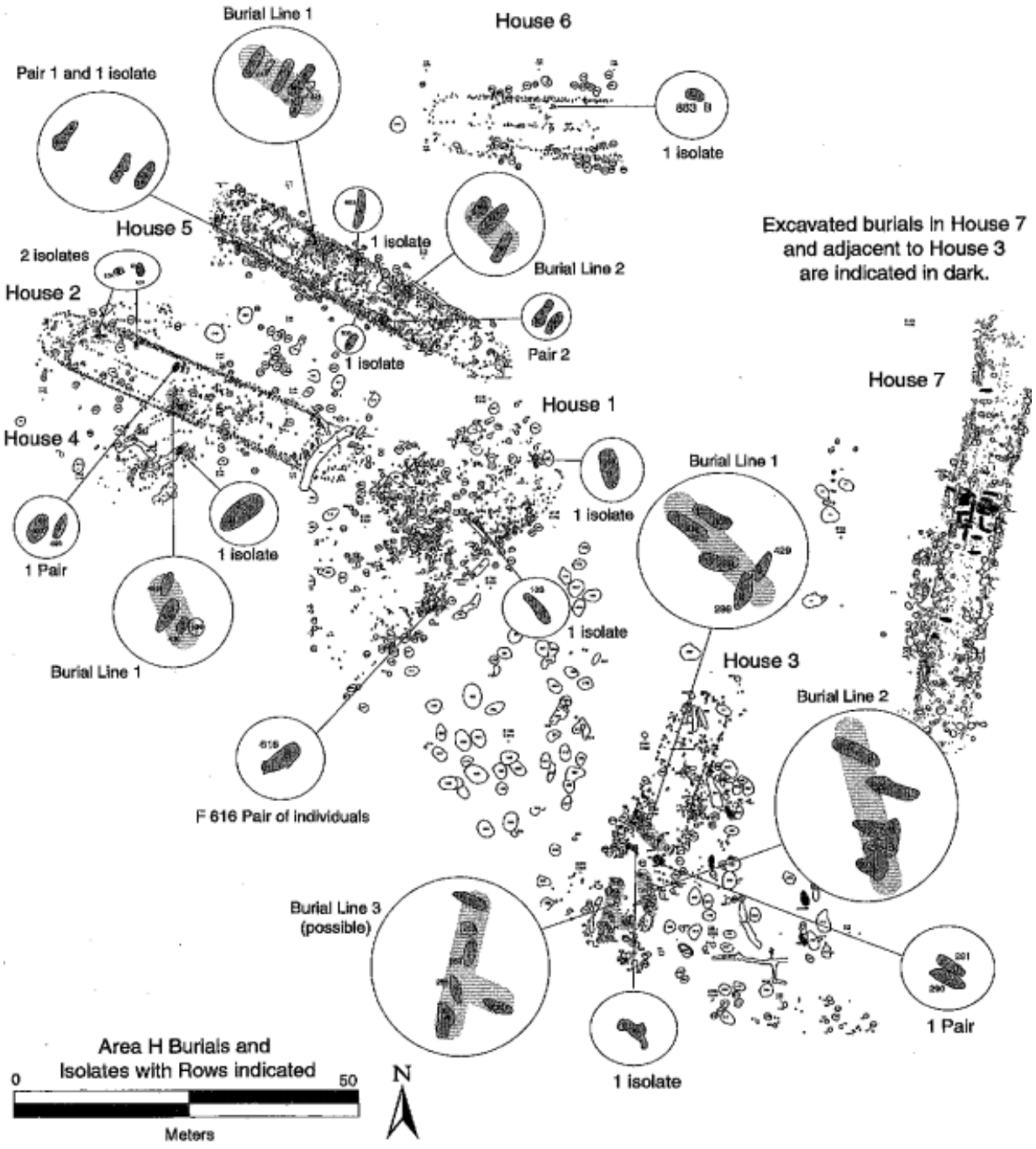

Figure 48: Burials and Isolated Human Remains in Area H at the Tremaine Site (O'Gorman 1995:180)

"familial subgroups of the larger longhouse affiliation" (O'Gorman 1995:181). Additional structures also showed isolate or paired burials, which were variable in age and sex distribution (O'Gorman 1995:181). Isolated (tertiary) human remains were recovered from Areas D, E, and H of the site (O'Gorman 1995:181). Most of the isolated elements recovered were from Area H of the site, with two cranial remains found in Area D and dental remains found in Area E.

7.5.1.7 Summary of Spatial Analysis

Human burials at Oneota sites have generally been seen in isolated cemeteries, within mortuary facilities, within village sites and long houses, and, to a lesser extent, intrusions into previous mound structures (Kreisa 1993; O'Gorman 1995). When examining the sites used for this dissertation, these same patterns are noticed. Isolated human remains have often been recovered on the surface, in the plowzone, and in non-burial and burial features at many Oneota sites. Culturally modified human remains have also been located at Oneota sites, although most concentrated in Iowa. It appears that isolated and culturally modified human remains appear to be found within non-burial features located outside of cemeteries, mounds, and structures.

7.5.2 Temporal Analysis

To examine if there were any differences based on temporal variations in the site distributions, additional comparisons were made based on classifications of horizon (temporal) and phase (material culture) for each of the sites used. The sites used for this test included the six major sites (Hoxie Farm and Morton Village and Norris Farms 36 in Illinois; Howard Goodhue, McKinney, and Wever in Iowa; and Tremaine in Wisconsin) and the three additional sites (Armstrong in Wisconsin and Correctionville and Dixon in Iowa). These sites were occupied

primarily during the Developmental (AD 1150-1350) and Classic (AD 1350-1650) periods (**Table 41**).

Table 41: Context for Human Remains and Cultural Modification for Increased Sample by Horizon for Nine Oneota Sites

	Emergent (AD 900-1150)	Developmental (AD 1150-1350)	Classic (AD 1350-1650)	Total
Primary Burial	0	9	283	**292**
Secondary Burial	0	14	9	**23**
Tertiary Remains	2	12	110	**124**
Multiple Burial	0	0	13	**13**
Post-Interment Addition	0	0	3	**3**
Unknown	0	0	37	**37**
Primary and Additional Modification	0	0	0	**0**
Primary and Perimortem Trauma	0	0	22	**22**
Secondary and Burning	0	0	1	**1**
Secondary and Perimortem Trauma	0	0	5	**5**
Tertiary and Burning	0	1	10	**11**
Tertiary and Cutmarks	1	2	8	**11**
Tertiary and Polish	0	0	1	**1**
Tertiary, Burning, and Polishing	0	0	1	**1**
Tertiary, Burning, Cutmarks	0	2	1	**3**
Tertiary, Cutmarks, Polishing	0	0	3	**3**
Tertiary, Burning, Cutmarks, Polishing	0	0	2	**2**
Tertiary and Worked Bone	1	0	0	**1**
Tertiary and Perimortem Trauma	0	0	3	**3**
Multiple/Post-Interment and Additional Modification	0	0	0	**0**
Multiple/Post-Interment and Perimortem Trauma	0	0	19	**19**
Unknown and Perimortem Trauma	0	0	1	**1**
Total	**4**	**40**	**532**	**576**

Correspondence analysis was used to determine if any patterning was present for type of cultural modification and horizon (**Figure 49**). The biplot displays two dimensions – horizon and type of cultural modification – on both axes. As is demonstrated by the biplot, 100% of the variation within the sample is accounted for and there are three distinct groupings.

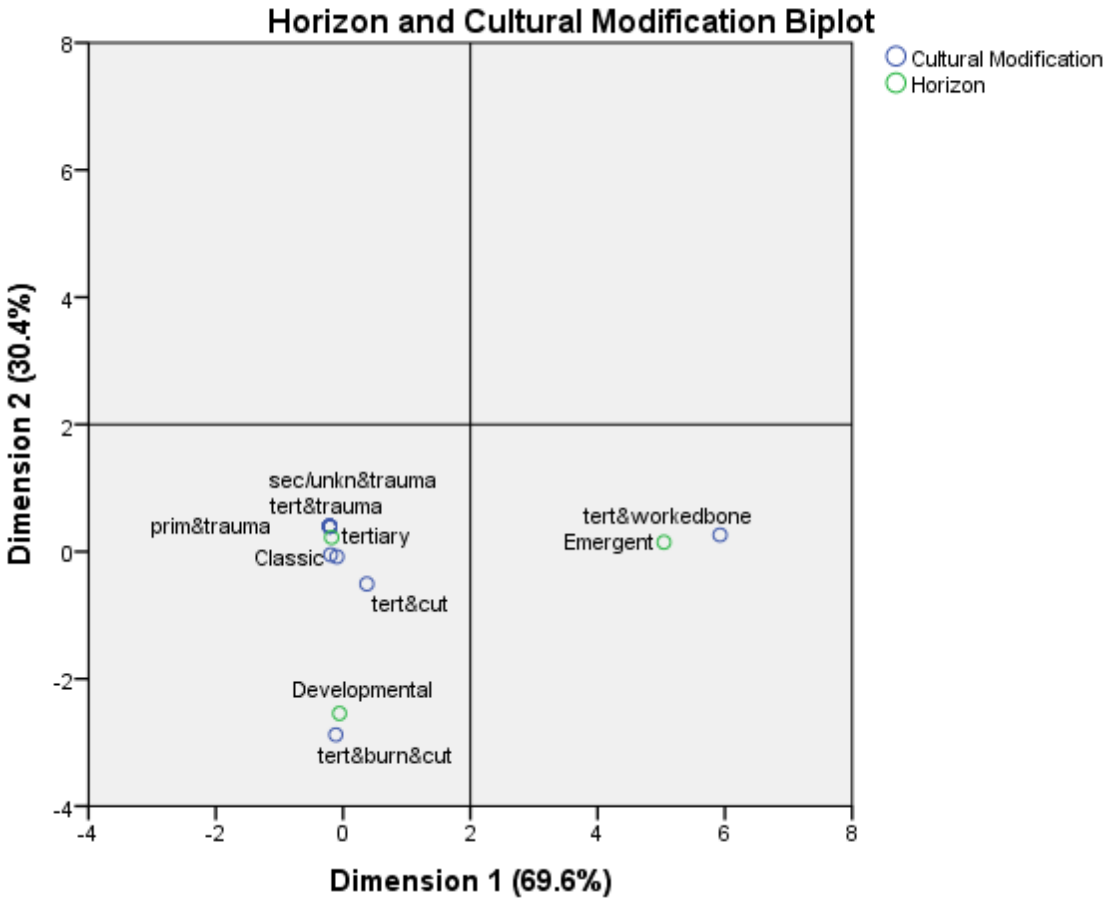

Figure 49: Correspondence Analysis for Cultural Modification and Horizon

Phase classifications were also utilized (**Table 42**). Although the phase designation represents similarities in material culture, the sites classified in within each phase are often temporally similar as well. Comparisons were only made using the six primary sites (Hoxie Farm and Morton Village and Norris Farms 36 in Illinois; Howard Goodhue, McKinney, and Wever in Iowa; and Tremaine in Wisconsin) in addition to Dixon and Correctionville in Iowa. The Armstrong site in Wisconsin (Red Wing phase) was excluded due to the paucity of the data. However, due to the overlapping dates of many of these phases, interpretations and conclusions are difficult.

Table 42: Context for Human Remains and Cultural Modification for Increased Sample by Phase for Eight Oneota Sites

	Bold Counselor (AD 1350-1500)	Fisher, Upper Mississippian (AD 1100-1350)	SE Iowa, Burlington (AD 1300)	Pammel Creek (AD 1380-1520)	Moingona (AD 1100-1400)	Correctionville (AD 1300-1500)	Total
Primary Burial	203	20	4	58	5	2	**292**
Secondary Burial	1	1	0	7	14	0	**23**
Tertiary Remains	16	39	18	28	6	15	**122**
Multiple Burial	10	2	0	1	0	0	**13**
Post-Interment Addition	2	0	0	1	0	0	**3**
Unknown	5	11	0	21	0	0	**37**
Primary and Additional Modification	0	0	0	0	0	0	**0**
Primary and Perimortem Trauma	19	1	0	2	0	0	**22**
Secondary and Burning	1	0	0	0	0	0	**1**
Secondary and Perimortem Trauma	5	0	0	0	0	0	**5**
Tertiary and Burning	0	9	1	0	1	0	**11**
Tertiary and Cutmarks	0	4	1	0	1	5	**11**
Tertiary and Polish	0	0	1	0	0	0	**1**
Tertiary, Burning, Polishing	0	0	1	0	0	0	**1**
Tertiary, Burning, Cutmarks	0	0	3	0	0	0	**3**
Tertiary, Cutmarks, Polishing	0	0	1	0	0	1	**2**
Tertiary, Burning, Cutmarks, Polishing	0	0	2	0	0	0	**2**
Tertiary and Perimortem Trauma	0	0	1	2	0	0	**3**
Multiple/Post-Interment and Additional Modification	0	0	0	0	0	0	**0**
Multiple/Post-Interment and Perimortem Trauma	19	0	0	0	0	0	**19**
Unknown and Perimortem Trauma	1	0	0	0	0	0	**1**
Total	**282**	**87**	**33**	**120**	**27**	**23**	**572**

Correspondence analysis was used to determine if any patterning was present for type of cultural modification and phase (**Figure 50**). The biplot displays two dimensions – phase and type of cultural modification – on both axes. As is demonstrated by the biplot, 84.5% of the variation within the sample is accounted for and there are three distinct groupings.

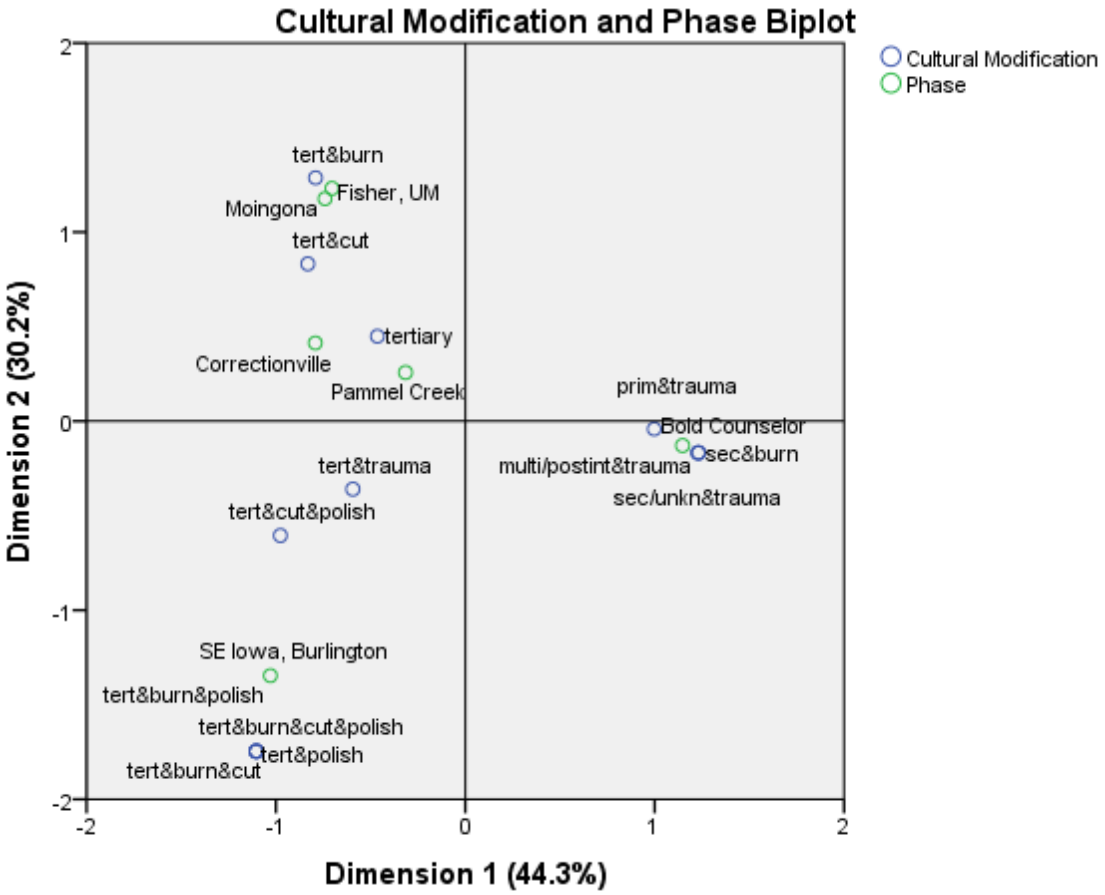

Figure 50: Correspondence Analysis for Cultural Modification and Phase

The sites located in southeastern Iowa tend to be associated with tertiary remains with multiple additional cultural modifications. The La Crosse phase (the Tremaine site) is associated with tertiary remains and tertiary remains with evidence of trauma. The Bold Counselor phase (Morton Village/Norris Farms 36) is associated with primary, secondary, and multiple burials with trauma. The Fisher and Upper Mississippian phase (Hoxie Farm) and Moingona phase (Howard Goodhue) tend to be associated with tertiary remains that have been cut or burned.

7.6 Research Question 5: Violence

Typical osteological indicators of violence include the presence of scalping and/or perimortem trauma to skeletal remains. While the majority of cases of "violence" occurred at Norris Farms 36, a few instances were also present at some of the other sites used for this dissertation (**Table 43**).

Table 43: Distribution of Human Remains with Trauma by Site

	Howard Goodhue	McKinney	Wever	Hoxie Farm	Morton Village/ Norris Farms 36	Tremaine	Total
Primary and Scalping	0	0	0	1	0	2	3
Primary and Perimortem Trauma	0	0	0	0	14	0	14
Primary, Scalping, Trauma	0	0	0	0	5	0	5
Secondary and Scalping	0	0	0	0	1	0	1
Secondary and Perimortem Trauma	0	0	0	0	3	0	3
Secondary, Scalping, Trauma	0	0	0	0	1	0	1
Tertiary and Scalping	1	0	0	0	0	2	3
Multiple and Perimortem Trauma	0	0	0	0	7	0	7
Multiple, Scalping, Trauma	0	0	0	0	3	0	3
Post-Interment and Perimortem Trauma	0	0	0	0	7	0	7
Post-Interment, Scalping, Trauma	0	0	0	0	2	0	2
Unknown and Scalping	0	0	0	0	1	0	1
Total	**1**	**0**	**0**	**1**	**44**	**4**	**50**

When examining the correspondence analyses for previous research questions (see **Figures 49 and 50**), it is noticeable that most instances of scalping and perimortem trauma do not appear to cluster with other instances of cultural modification. The only exception to this is the presence of indicators of "violence", specifically scalping, on tertiary remains. However, it should be noted that "scalping" marks on tertiary remains may be caused by other natural or cultural processes that left incisions that may resemble those of scalping. Additionally, the

clustering of indicators of "violence" from cultural modification may be due to its strong association with Norris Farms 36.

7.7 Summary of All Results

This dissertation examined multiple Oneota sites across the Midwest to evaluate patterning in the distribution of isolated and fragmented remains, as well as those that displayed cultural modification. To increase sample size, additional sites were included in the analysis, which confirmed the results.

Scattered and isolated human remains are often encountered at Oneota village sites. Examining the elements found at each site, cranial and long bone elements are the most common. Of note, these same elements are the ones that are most often culturally modified. Spatial analysis of the sites used for this dissertation demonstrate that sites that have evidence of longhouses, such as Tremaine and Wever, culturally modified human remains tend to be located either within or adjacent to these structures. At other sites, they are located primarily in pit features or as isolated finds within the village site.

Distinct patterning in the presence of cultural modification can also be noted. The Tremaine site provided evidence of isolated and tertiary human remains, some of which had cutmarks that were concluded to be from scalping. Although no additional modifications were noted at Tremaine, recent excavations of other sites in Wisconsin may show evidence of other cultural modifications (Katherine Stevenson, personal communication, 2017). Instances of cultural modification are rare. In Illinois, cultural modification was present at some Oneota sites, and included cutmarks attributed to defleshing and burning. These modifications may have been a result of pit's later reuse as a hearth or other purpose, as opposed to an intentional or purposeful cultural modification, as suggested by Fricker et al. (2013:426) for distal phalanges

found in a hearth. The instances of cultural modification increase in number and variation when examining Oneota sites in Iowa. Iowa sites contained the highest number of fragmented and culturally modified human remains, suggesting that this treatment was more common and/or wide-spread in these locales.

CHAPTER 8: INTERPRETATIONS

8.1 Introduction

This dissertation sought to examine fragmented and culturally modified human remains commonly found at Oneota sites. This research concentrated on the interpretation of what may be called tertiary human remains; those that may result from multiple cultural or natural processes but are not primary or secondary burials. In addition to tertiary data, both primary and secondary burial data were included in the analysis to provide a more holistic understanding of the Oneota.

The first goal of this dissertation was to demonstrate that previously collected archaeological, mortuary, and osteological data could be used to answer new research questions, as well as re-evaluate previous conclusions of violence. Although limitations of the data precluded some analyses, other research questions could be evaluated for this dissertation using previously collected data. This analysis also included the examination of how researchers have approached human remains in non-primary contexts, as well as recommendations for data collection for tertiary human remains.

The second goal focused on the fragmented and culturally modified human remains. Research questions examined patterning in the data along contextual, temporal, and spatial aspects. Multiple theories involving the body and its divisible nature helped to frame the interpretation of fragmentation of human remains. This included assessing the presence of violence at the Oneota sites used for this dissertation and the use of ethnographic resources.

Several steps were taken to select and statistically analyze the data used for this dissertation. Sites utilized met several criteria, including the presence of primary burials, an associated village with a site map, and fragmented and/or culturally modified human remains.

These criteria limited the number of sites that could be utilized for statistical analysis. Many Oneota sites did not meet one or more of these criteria and were therefore excluded. This included sites such as Karow and Brainerd in Wisconsin that had unassociated human remains and limited or no site maps or contextualization; and Vosburg, Bryan, and Diamond Bluff/Mero in Minnesota which had limited or no site maps and had very limited osteological data. For the majority of these excluded sites, excavations occurred in the early to mid-nineteenth century, and standards for archaeological, mortuary, and osteological recordation were not yet established. This would have added to the already limited types of analyses that could be performed. However, some of these sites did have evidence of cultural modification and will be discussed later in this chapter.

8.2 Dissertation Data

A total of six sites were used for statistical analysis in this dissertation: Howard Goodhue, McKinney, and Wever in Iowa; Hoxie Farm and Morton Village/Norris Farms 36 in Illinois; and Tremaine in Wisconsin. Sites that did not meet one or more of the criteria but had good data, such as culturally modified human remains with relevant context, were included in additional analyses. These included Correctionville and Dixon in Iowa and Armstrong in Wisconsin,. Finally, single instances of cultural modification, mostly located in Iowa, were included as an additional category for statistical analysis. These by no means encompass every instance of Oneota cultural modification but serve as a general baseline for the variation present.

During data analysis several difficulties were encountered. First, utilizing data collected by multiple researchers proved to be difficult. This primarily stemmed from how each researcher choose to treat data from non-primary internments. Four major patterns where noticed in how

researchers addressed isolated human remains. (1) Isolated human remains were listed in tables but were not discussed in the text. (2) Isolated human remains were discussed in the text but were not included as a table or with interment data. (3) Isolated human remains were discussed both within text and listed as a separate table or included with other primary burial data, if present. (4) Isolated human remains were reconstructed and re-fitted with other isolates or burials. A fifth pattern of exclusion of the isolated human remains may also be present for some sites; however, this research selected sites with recorded isolated human remains and so this treatment was not noted. Clearly, each of these treatments was reflective of the larger research goals and scope of the project. It was generally noted that when fewer isolated remains and interments were found, a lengthier discussion of the human remains was given. While larger scale projects or excavations often only focused on burials. Although each of these treatments is understandable, inconsistencies and difficulties in data collection for this dissertation primarily stemmed from differences in how these data were presented. For example, if data were reconstructed, multiple elements may belong to one individual, and if each location is not recorded, an aspect of the spatial arrangement and final deposition of that individual may be lost.

Contextual data for isolated human remains was also variable and quite often incomplete. Many isolated human remains were found in non-burial features, often described as cache, storage, and refuse pits, or sometimes just as a feature. Definitions for this terminology was variable and often not provided. It was also noted that the same feature at one site may be referred to using a mix of these terms depending on the source. Due to the often interchangeability of these terms and the difficulty of distinguishing them both in the field and in published resources, this dissertation required a simplification of a "non-burial feature" category to avoid misinterpretation of the feature's use. Additionally, our own assumptions of the use of

the feature are often intertwined with its name, such as refuse pits that are associated with unwanted or negative materials, which may not be justified when examining past cultures. Therefore, the general term of non-burial feature may have avoided clouding the interpretation of isolated human remains found within them.

It was also noted that general feature contents are often not recorded or listed. Or, if they are, their general location within the feature are not recorded. The location of the isolated human remains in relationship to other objects may give an idea of the purpose of the deposit. This information may have been available through an examination of field notes; however, this dissertation only utilized published resources. Future examinations at the site or state level should attempt to include these data to identify any additional patterning. Additionally, these non-burial features were listed by their designated feature number. However, the exact location of these features was often not described or listed. Site maps could sometimes be used to identify the location of the feature at the site. However, multiple maps were either not labelled with feature numbers or encompassed too large of an area to identify the feature numbers.

The data were severely limited for this dissertation. Some data were not accessible, while other data were not included because it was variable, inconsistent, or not present. This dissertation makes interpretations and conclusions based on the available data from published resources. However limited, this research demonstrates that new research questions can be asked utilizing data that may be old and problematic.

8.3 Ethnographic Data

Due to limits in ethnographic accounts for many descendant groups, ethnographic resources regarding the Winnebago and Ioway were primarily utilized for this dissertation. This

is in accordance with similarities noted in Winnebago clan organization that can also be seen in southern Siouan groups (e.g. Ioway, Oto, and Missouri), central Siouan groups (e.g. Omaha, Kansa, and Osage), and central Algonquian groups, while major differences are noted for northern Siouan groups (e.g. Crow, Dakota) (Radin 1910; Griffin 1960).

At the time of contact, the Winnebago were located on Green Bay in Wisconsin. However, it is believed that they migrated to this area from the southeast, possibly from northern Illinois and later moved into areas across southwest Wisconsin and northwest Illinois (Lurie 1994:379). The Winnebago later historically occupied an area bounded by Lake Winnebago and the Rock River on the east and south, the Fox-Wisconsin portage route and the Black River on the east and north, the Mississippi River on the west, and the area of Prairie du Chien on the south (Lurie 1994:380). The Winnebago were a tribal society with twelve clans grouped as belonging to either the Earth or the Sky (Lurie 1994:381). They occupied year-round villages with longhouse-type structures organized by nuclear units (Lurie 1994:381). They resided near lakes and marsh areas and near deciduous and coniferous forests and prairie, as their economy depended primarily on maize, beans, and squash. They also cultivated wild plants such as blueberries and cranberries, hunted bison and deer, and later participated in the fur trade with Europeans. (Lurie 1994:379,381). The Ioway were historically located within the boundaries of the modern state of Iowa. Similar to the Winnebago, they occupied small villages along river bluffs and terraces. Specifically, they were situated near rivers, plains, and forests where they could take advantage of multiple resources (Blaine 1995:15).

8.4 Research Question 1: Using Previously Collected Data

Can previously collected data be used for modern osteological research and can these data be used to identify patterning in the treatment of human remains by Oneota people?

The majority of the osteological, mortuary, and archaeological data utilized for this dissertation was previously collected by multiple researchers. Using previously collected data was a choice by the author for two primary reasons. First, recent osteological and mortuary data from Midwest archaeological sites has become limited and problematic due to protection and repatriation laws, such as NAGPRA. Second, it is important to evaluate data that has already been collected and may have yet to be fully examined. Mortuary archaeologists and bioarchaeologists need to be able to re-examine old data and previous conclusions, as well as develop new research questions. As demonstrated by this research, the general lack of attention to tertiary human remains has unintentionally caused a narrowing of data. Although this doesn't necessarily limit the types of questions that can be asked, it may limit the amount of detail we can use to examine them. Thus, a part of this dissertation sought to examine if previously collected data could be utilized to answer new research questions, as well as evaluate previous conclusions.

For her dissertation, Kendell (2016) examined data collected by the Smithsonian Institution Repatriation Office. She found the osteological data were consistent and easily accessible; however, she also found a lack of standardization for photographic and radiological images, as well as archaeological and mortuary data. Similar inconsistencies were also noted in the data used in this dissertation, especially regarding contextual data. As discussed, some sites were excluded from analysis based on a lack of archaeological, mortuary, and osteological data to contextualize the human remains. Generally, these sites were excavated prior to the introduction of *Standards for Data Collection from Human Skeletal Remains* (*Standards*) by Jane E. Buikstra and Douglas Ubelaker (1994). However, additional inconsistencies in how data were collected and recorded were also noted for sites used for analysis, including the use of

terminology and the collection of osteological and spatial location of human remains. This was particularly true for tertiary and cultural modified human remains.

8.4.1 Data Collection Recommendations for Tertiary Human Remains

Although isolated, scattered, fragmented, and culturally modified human remains have been recovered from multiple sites, they generally have been treated differently by researchers. As discussed earlier, some have listed the remains in appendices or as problematical deposits that lie outside of the "normal" mortuary program, while others have described them in text, but do not include them with other mortuary data. Some researchers have also attempted to reconstruct the fragmentation, following protocols and methodologies for commingled human remains. Each of these choices is understandable, especially when addressing a specific research question. However, all affect the types and amount of data available.

As *Standards* currently does not provide resources on how to collect data from non-primary human remains, especially for isolated elements, it was a goal of this dissertation to attempt to identify best practices for collecting osteological, mortuary, and archaeological data regarding tertiary human remains.

Osteological data for fragmented human remains were often hindered by the fragmented nature. A detailed description of the element should be given, including measurements, pathologies, and postmortem modifications. If age and sex markers are identifiable, those should be noted. Any taphonomic changes should be noted and described in detail. If possible, these should be identified as belonging to cultural or natural processes and as occurring either ante-, peri-, or postmortem. If multiple fragments occur in the same deposit, pertinent commingling

methods for refitting should be used, but each fragment should maintain its individual contextual information.

Archaeological and mortuary data should include the location of the fragment. Spatial location should be recorded, including GPS, if possible. Relations to other features, such as structures and burials, should be described and/or measured. The location of the fragment at the site should be described, such as plowzone, surface, intrusion, non-burial feature, etc. Maps should be created that include this data, demonstrating labeled features.

The location of the fragment within the deposit, as well as its relationship to other cultural material within the deposit should be described. As there is currently no methodology to distinguish between different types of pits, if terminology such as refuse, cache, storage, etc. are utilized to describe features, these should be defined and/or described.

8.5 Research Question 2: Isolated Tertiary Human Remains

Tertiary, fragmented, and isolated human remains are commonly encountered in Oneota village sites. Fragmentation theory suggests that the body is divisible and partible and parts of which can contain meaning. Using fragmentation theory to examine the osteological, mortuary, and archaeological data can patterning be determined?

Human remains at Oneota sites have generally been found in multiple contexts, including cemeteries, within structures such as longhouses or mortuary facilities, and intrusions into Late Woodland mounds (Kreisa 1993; O'Gorman 1995). An additional category of fragmented and scattered human remains is also present at many Oneota sites. Oneota scholars have suggested that fragmented remains found throughout the village may be due to several different processes, including processing, trophy taking, or later disturbance (O'Gorman 1995; Hollinger and Vradenburg 2004; Hollinger 2005). However, there has been no specific research designed to provide or evaluate hypotheses associated with the occurrence of fragmentary remains.

The goal of this research question was to identify any patterning regarding isolated human remains found at Oneota sites. Multiple methodologies were proposed, including incorporating spatial data and reconstructing taphonomy. For this dissertation, the number and frequency of elements that were found as isolates, scatter, or in the plowzone were identified and visualized using skeleton frequency maps. Due to difficulties and inconsistencies with data, a full spatial investigation of tertiary remains could not be performed.

8.5.1 Results

For each site, a skeleton frequency map was created to demonstrate the relative frequency of each skeletal element for surface and/or non-burial features. This allowed for comparisons between sites to identify any differences in the number and type of fragmented elements usually recovered. These maps were created by tabulating the number of each type of fragmented element recovered at each site. Overall, all frequency maps demonstrated that the most frequently recovered elements were cranial remains, followed by long bone fragments, specifically femur.

8.5.2 Interpretation

In the examination of the fragmentation of human remains, it is necessary to reconstruct both the cultural and taphonomic processes as to how these deposits were formed, as well as frame them using theoretical approaches. To interpret the significance of a focus on cranial remains, social theory and ethnographies were utilized to construct how the Oneota viewed the body and specifically the head.

8.5.2.1 Partibility, Fragmentation, and Accumulation

Although modern and Western cultures have generally viewed the body as having "clear boundaries between the inside and outside" and as "self-contained units" (Duncan and Schwarz 2014:149), many non-Western cultures see bodies as dividual, partible, and permeable. In contrast to our bounded idea of the body, dividual and partible bodies can be broken into a series of parts that contain meaning, while permeable bodies have fluid boundaries (Fowler 2004, Brück 2006; Budja 2010; Geller 2012; Duncan and Schwarz 2014).

Body parts may have served as ritual objects, mark social status, or function as a way for the living to maintain and interact with the deceased individual (Chapman 2000; Bonogofsky 2011a). The exchange of the body parts also may have allowed for bodies to be commodified and to create and maintain social relationships between the living and the dead; a process called enchainment by Chapman (2000).

As enchainment through fragmentation allows for the building of social relations, accumulation enables summative statements about the availability and diversity of material culture, as well as social practices. Accumulation of items, including human and animal remains, grave goods, figures, etc. are deliberately placed and thus highly structured, giving specific social reasons for their location on the landscape (Chapman 2000).

8.5.2.2 Redeposited, Lost, or Curated

It appears for the Oneota, fragmented and tertiary human remains are frequently encountered on the site surface and within non-burial features. These remains resulted from bones that were redeposited, lost, or curated during any processing event, such as in the funerary cycle, extra-funerary processes, and post-funerary processes (Weiss-Krejci 2011). **Figure 51** is

Weiss-Krejci's (2011) schematic, which outlines these processes. There are multiple opportunities during the funerary process, as well as during post- and extra-funerary processes, that human remains could be lost, (re-)deposited, or curated. According to Weiss-Krejci (2011), in order to identify if the human remains are the result of any one of these processes, it is necessary to identify the formation processes that led to the mortuary deposit as different formation processes may lead to similar mortuary deposits.

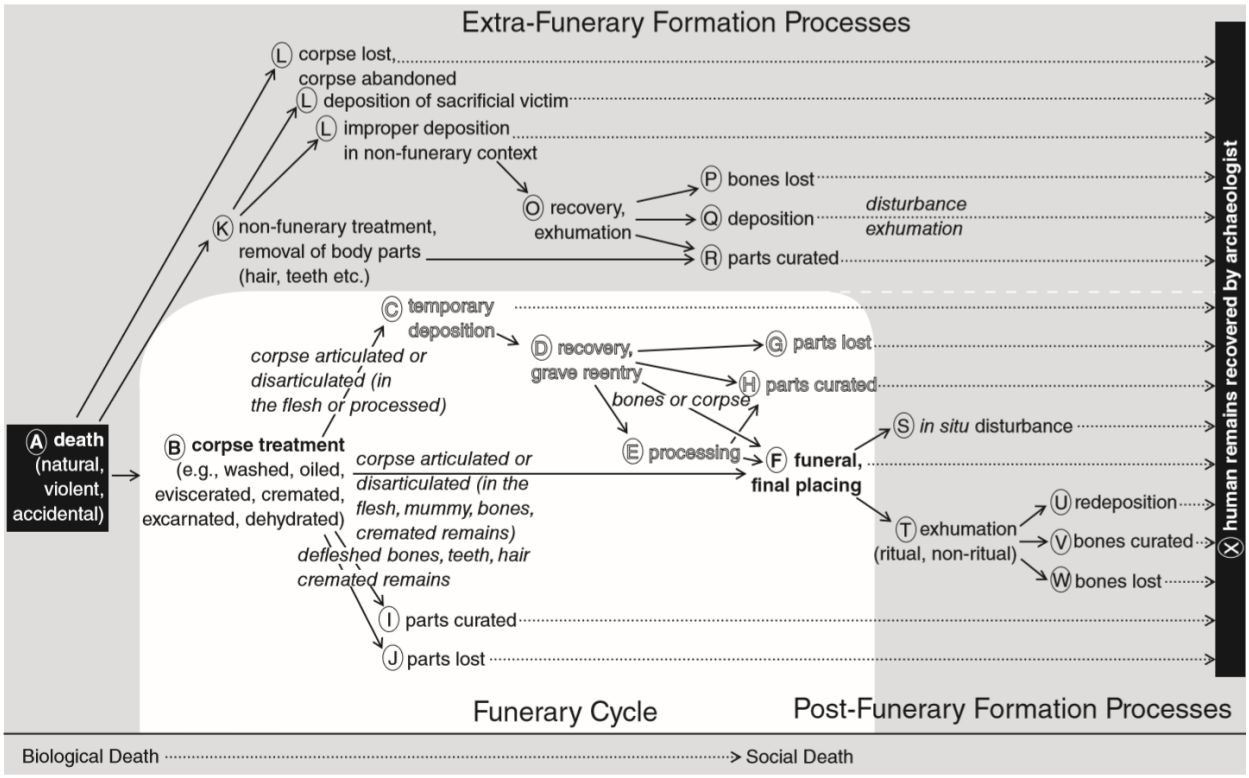

Figure 51: Extra- and Post-Funerary Formation Processes (Weiss-Krejci 2011:69)

It is a possibility that some scattered human remains represent remains that have been disturbed from their original context. This is may be the case for sites with burials that are located within the village or structure, as any re-building episodes or additional burial events may have disturbed older burials, leading to commingling and scattering. However, not all Oneota sites contained burials within structures, such as seen at the Norris Farms 36 cemetery. In

cases of extra-mural cemeteries, scattered human remains found within the village would not have resulted from disturbed burials. Thus, it is likely that many isolated human remains were selected, or curated, for specific purposes.

Although this dissertation did not utilize the exact extra- and post-funerary formations processes outlined by Weiss-Krejci (2011), her schematic offers a useful way to visualize the complex nature of the mortuary process. As demonstrated by Weiss-Krejci's graphic, there are multiple processes within, after, and outside of the typical mortuary program that could result in isolated and scattered human remains; each one of which should be evaluated.

8.5.2.3 Trash or Ritual

To reconstruct formation processes, researchers have focused on the context of the deposit of fragmented human remains and have generally attributed them as belonging to a ritual process or as refuse (e.g. Thilderkvist 2013; Brück 1995, Hill 1995; Walker 1995). However, classifying the remains as refuse often clouds our judgement in the interpretation of the meaning of the object, as refuse and rubbish are generally associated with trash and other negative connotations (Walker 1995). This has also led to an association of human remains found in refuse deposits as resulting from violence and sacrifice, while those attributed to ritual are often associated with ancestor worship or non-violent acts.

However, both ritual and refuse disposal are culturally constructed and related to ideology (Brück 1995). Thus, the distinction between ritual and non-ritual acts may not be clearly defined. Instead, human remains found in contexts attributed to ritual and rubbish are both structured deposits. It is therefore reasonable to assume that any death (natural, violent, accidental, etc.) could result in human remains in multiple contexts, ritual or non-ritual.

Removal of certain bones and placing them in specific locations, such as middens or domestic contexts, is a way of "keeping the essence of the dead alive through the materiality of their bones" (Chapman 2000:145). Places, both domestic and mortuary, are links to ancestral space and will accumulate a greater ancestral link the longer they are inhabited or used (Chapman 2000). By placing bones into a specific location, it creates a "place-value", linking ancestors to future relatives. Thus, the deposition of human remains into *any* location can be considered a link between the living and the ancestors and "automatically makes the midden into which they are incorporated a symbolically significant deposit" (Chapman 2000:140).

8.5.3 Summary of Isolated Tertiary Human Remains

Similar isolated human remains have been investigated by multiple researchers at Iroquoian sites (e.g. Williamson 2007; Glencross 2014; Jenkins 2016). Some have suggested that a predominance of cranial and long bone remains, the presence of fragmented remains, and modifications such as cutmarks and burning should be attributed to human sacrifice (Cooper 1984 in Glencross 2014). However, as Glencross (2014) notes, context is important in this distinction, as funerary processes may also cause similar marks. Due to the documented prevalence of wars and avenged death killings that led to the disarticulated remains of captives were scattered in middens, pits, and on the ground surface, Glencross (2014) still suggests that captives can be identified based on the presence of scattered human remains in refuse pits, middens, and on the site surface.

However, the difficulty in reconstructing these processes lies in distinguishing between intentional and un-intentional fragmentation of the body, as outlined by fragmentation theory (Chapman 2000; Duncan and Schwarz 2014). According to Chapman (2000), fragmentation can

occur in several ways, including accident, use-wear, ritual killing, dispersing fertility, and deliberate breakage to form and maintain relationships. It is reasonable to assume that unintentional fragmentation of human remains would result in a relative equal number of elements and side, accounting for differences in size of element and likelihood of preservation. This dissertation demonstrated that the frequency of fragmented Oneota human remains favored cranial remains, followed by long bones. Skeleton frequency maps demonstrated that cranial remains, followed by long bone fragments, were found as isolates on the site surface and in features within the village site.

Fragmentation of human remains can occur for multiple reasons, "including losing teeth; cutting fingernails or hair; circumcision; amputation via trauma, medical procedure, or punishment; organ donation or transplantation; trophy taking; some forms of ancestor veneration; the use of religious relics; dissection or autopsy; archaeological excavation and subsequent curation; or display of parts of human remains in museums" (Duncan and Schwarz 2014:155). As described earlier, the amount of contextual information required to understand and reconstruct the processes that led to fragmentation is not always present, especially when looking at older collections. Even for more recent excavations, unless the focus of the research question is to address fragmentary human remains, the amount of contextual information required for to answer these questions may be beyond what most archaeologists typically collect. However, utilizing available contextual and ethnographic resources, an association between the location of cultural modification and probable meaning can be presumed. Here it is argued that although the exact individuals who underwent this process (violence or veneration) are still unknown, the cranium and soul were an important element in this process.

8.6 Research Question 3: Cultural Modification

Culturally modified bone can result from multiple processes. Through the examination of osteological, mortuary, and archaeological data, can patterning of culturally modified skeletal remains be determined? If patterning is present, can possible explanations for this patterning be identified using ethnographic sources and theories regarding the body?

The cultural modification of human (and non-human) remains has occurred in many cultures throughout time. Recently, cultural modification in the Midwestern United States has gained more attention (e.g. Hargrave et al. 2015); however, until this dissertation, there has yet to be a systematic study of cultural modification for the Oneota. Thus, this research proposed to examine cultural modification data at Oneota sites across the Midwest by examining the presence and type of modification on human remains and the context in which they occur.

8.6.1 Results

Of the human remains recovered at the Oneota sites used for this dissertation, some were fragmentary and had additional cultural modifications, such as burning, incising, and polishing. As demonstrated by correspondence analysis, patterning emerged to the type of cultural modification found at the grouped sites of McKinney, Howard Goodhue, and Wever; Morton Village/Norris Farms 36; and Hoxie Farm and Tremaine. These results were supported when additional data from sites in Iowa, Illinois, and Wisconsin were included.

8.6.1.1 Iowa Sites

The three Oneota sites in Iowa used for this dissertation included Howard Goodhue, McKinney, and Wever, located in central and southeastern Iowa. Correspondence analysis associated these sites with remains that showed burning, polishing, and cutmarks attributed to dismemberment. The additional sites of Correctionville and Dixon in Iowa, as well as Armstrong

in Wisconsin showed similar composition in the presence and type of cultural modification. An additional correspondence analysis was performed in an attempt to validate these results, and it was demonstrated that these Iowa sites, as well as the Armstrong site in Wisconsin, clustered with multiple forms of cultural modification. These primarily included combinations of burning, polishing, incising, and dismemberment.

8.6.1.2 Morton Village and Norris Farms 36 Cemetery

For Morton Village and Norris Farms 36, correspondence analysis showed associations with primary and multiple burials, as well as post interment additions. Evidence of trauma, including scalping and perimortem trauma, in both primary, secondary, and multiple burials were also associated with this site. This is expected based on the known violence found at the Norris Farms 36 cemetery.

8.6.1.3 Tremaine and Hoxie Farm

The Hoxie Farm site in northern Illinois, included the Fortified Village and Main Occupation areas Hoxie Farm and the site of Tremaine in Wisconsin were similar in their composition of presence and type of cultural modification. Correspondence analysis demonstrated associations with tertiary remains and tertiary remains with trauma and cutmarks.

8.6.1.4 Additional Sites

Cultural modification data from multiple sites in Iowa and Illinois were included. Using Kruskal-Wallis tests, these data were found to not associate with any of the other sites used for this dissertation. This is most likely a reflection of the composition of the data, in that the

cultural modification data only consisted of one or a few data points per site, while the other sites had much more variation. All additional sites that contained only cultural modification data were grouped following Kruskal-Wallis tests.

Morton Village and Norris Farms 36 clustered with primary, secondary, multiple, and post interment burials that had evidence of trauma. The grouped sites in Iowa, including Armstrong, and the grouped sites of Hoxie Farm and Tremaine associated with tertiary remains and tertiary remains displaying additional modifications. The cultural modification data only clustered with primary remains with cutmarks and tertiary remains that were "worked", such as long bones made into pipes from punctures.

8.6.1.5 Summary of Cultural Modification Results

When additional cultural modification data were included from multiple sites in Iowa and the Anker site in Illinois, these data were similar in composition for the presence and type of cultural modification. As can be seen by **Figure 52**, cultural modification data for all included sites showed a predominance of cutmarks, either associated with dismemberment (28.89%), scalping (4.44%), incising (11.11%), or those that could not be attributed to a cause (28.89%). This was followed in frequency by burning (13.33%), polishing (11.11%), and notching (2.22%). It should be noted that some elements displayed multiple types of modifications, and these are counted as separate modifications in the figure below.

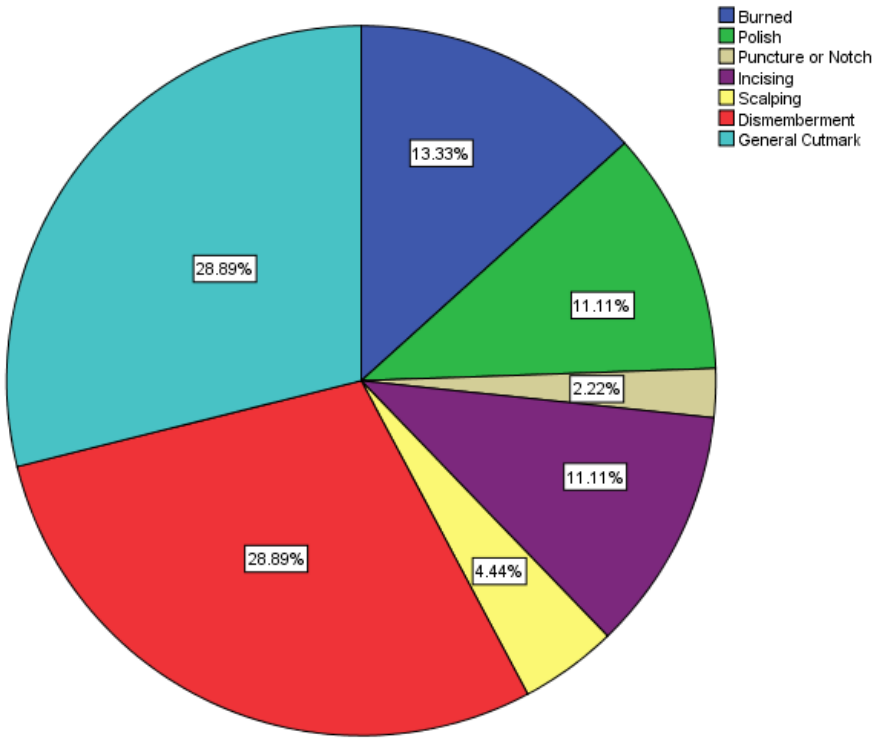

Figure 52: Frequency of Type of Cultural Modification

Correspondence analysis demonstrated very clear patterning in the type of cultural modification present at the Oneota sites used for this dissertation. Evidence of cultural modification of human remains at Oneota sites has been found across the Midwest but appears to be most highly concentrated at sites located in Iowa. Instances of cultural modification occurred in Wisconsin and Illinois, but these instances are much fewer. Of the human remains that displayed modifications, most of these were cranial remains (71.23%), including the mandible (4.11%) (**Figure 53**). Unfortunately, the fragmented nature of most of these remains excluded any type of age or sex estimations.

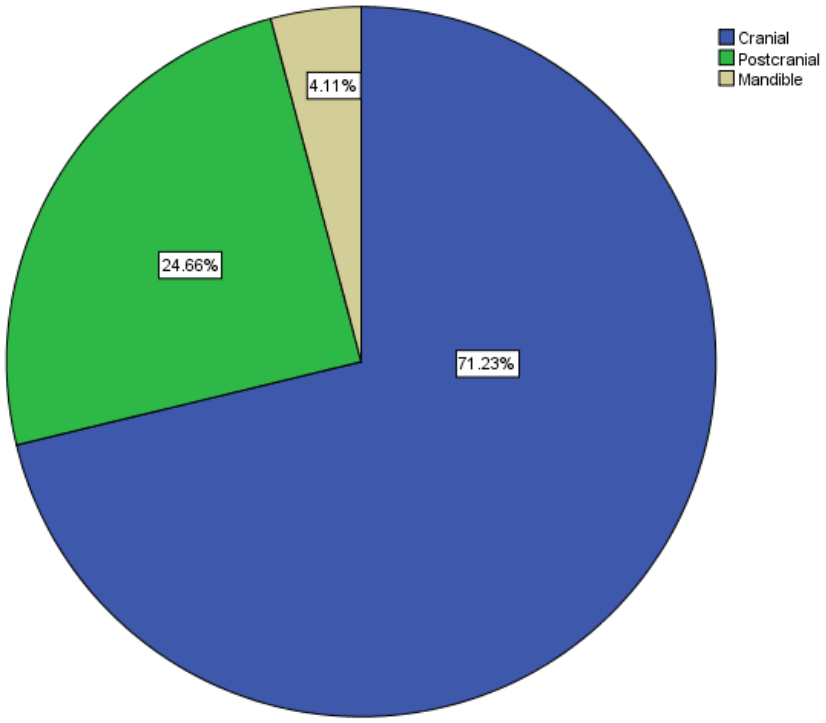

Figure 53: Frequency of Location of Cultural Modification

8.6.2 Interpretation

The cranium was the most often selected element for both fragmentation and cultural modification among the Oneota. Additionally, both fragmentary and culturally modified human remains also appear in similar contexts: primarily non-burial features located within the village but outside of structures (see Research Question 4). This implies that these remains had similar meanings and/or functions.

The fragmentation of human remains among the Oneota was likely one step in a process that resulted in cultural modification. For fragments that display iconography, it appears fragmentation occurred after decoration, as may decorations have been partially broken and lost. However, for remains that have been burned, this treatment appears to have been one of the last stages, occurring after fragmentation.

Thus, it appears that specific elements were selected for this mortuary treatment; primarily the head but also occasionally the femur or other long bones. The individual was defleshed and/or dismembered in order to select these elements. This likely resulted in small cutmarks that are associated with dismemberment and/or scalping. The element then may have undergone further cultural modification through decorative and symbolic incising.

After the selection of the element and possible decoration, the partible nature of the body allowed for fragmentation. As a complete object and/or after fragmentation, the fragment was utilized, as demonstrated by polishing. These same elements were disposed of in specific locations across the site. Some of these items were placed in features that were burned to aid in the release of the soul and/or guiding ancestors through the afterlife.

Through the process of culturally modifying human remains, a specific meaning was created. Most notably, Chapman (2000) and Fowler (2004) argued that the creation of an object causes an extension of the maker's personhood into that object; objects are created out of people. The same concepts can be applied to the creation of culturally modified human remains. Although these modified remains may represent who that individual once was, whether a slain captive or an ancestor, a portion of the maker's identity and person is now also intertwined with the modified bone. Thus, it is likely that the creation of the object, through the act of cultural modification, had as much importance as the final product (Hedman 2015).

8.6.2.1 Differential Use and Differential Value

The selection of the human remains for fragmentation and cultural modification stemmed from concepts of differential use and differential value (Smith 2015). Differential use suggests that human remains, like any material, can be modified for the creation of symbolic objects. It is

through differential value that human remains and specific elements are selected for this process. As the cranium was the most often modified bone in the data used for this dissertation, it appears that differential value was placed on the cranium. Although other modified elements, such as long bones, are occasionally found, these appear to be rare and suggest that they are only modified and/or used when warranted (Smith 2015). As long bones were recovered, it is likely that any portion of the bone could serve a symbolic purpose; however, cranial remains were likely preferred due to their relationship with the soul of the deceased.

8.6.2.2 The Head and the Soul

The head is the most common element used in cultural modification, likely as it directly displays the individual and holds their personhood (Larson 2011) and held "immense symbolic, social, religious, and political value" (Bonogofsky 2011a:2). Any additional postmortem modifications to the skull would only serve to further enhance these meanings (Bonogofsky 2011a), specifically as "power objects" (Smith 2015:272).

The cranium is often associated with the scalp and the hairlock. The "hair on the crown of the head", specifically the "area above the forehead" and the "hair whorl at the upper back of the head", was believed to hold the soul or essence in some Native American cultures (Sundstrom 2015). For many Native American cultures, the idea of the soul or an essence remains with the bones or human body parts after physical death (Sundstrom 2015). In other words, physical death released the sentient soul, but an additional soul remained with the bones (Smith 2015:273). Sundstrom (2015:251) argues how Western ideas of the scalp and the head have been projected onto past cultures and often used by researchers to assume that scalping equates to trophies of war "to prove that a warrior killed an enemy, to humiliate the enemy, and

to disable the dead enemy in some way." Although there are cases where scalping occurred on living people, as evidenced by antemortem scalping marks present at Norris Farms 36 for example, these were cases of extreme violence and pain. It is likely that scalping most often occurred on a corpse and was considered a religious obligation for mourning (Sundstrom 2015). Simply "equating the modification of a corpse with torture or violence only muddies the interpretation of trophy taking" (Sundstrom 2015:251).

According to Sundstrom (2015), the ethnographic literature demonstrates that scalps were taken both opportunistically and during raids for reciprocal or honor killing. Obtained scalps were then used in ceremonies and eventually burned or buried (Sundstrom 2015). For the Ioway, the scalp was important in many religious ceremonies, to "wield poster over the enemy" and "to feed the Thunder in the spring opening of the warbundles" (Foster 1994:76). Specifically, the 'scalplock' was located "just above the resting place of the soul and was thus its symbolic container" (Foster 1994:75). Scalps were not always trophies of war but symbolized the "soul of the slain enemy that would accompany a deceased loved one to the afterlife" or used in sacred bundles or religious offerings (Sundstrom 2015:259). Taking a scalp, although one not necessarily from the enemy, ended the cycle of revenge killing and mourning (Sundstrom 2015).

8.6.3 Results: Contextual Data

As the final deposition of fragmentary and culturally modified human remains may elucidate aspects of their meaning, correspondence analysis was used to determine if any associations were present. Isolated remains found on the surface were most associated with cutmarks and polishing; and burning, polishing, and incising. Human remains found in non-burial features and as isolates clustered together and were associated with remains that had been

burned and polished; burned; and burned and dismembered, as well as cutmarks that could not be categorized as the result of violence, dismemberment, or decorative incising. Evidence of scalping was also present at multiple sites and was found to be highly associated with burials. Only the broad category of "non-burial feature" could be included due to inconsistencies between researchers in classification of these pits, such as with the labels of refuse and cache.

8.6.4 Interpretation

As discussed previously, the meaning behind the disposal of this object in a refuse or cache pit may be similar, as both ritual and non-ritual activities are culturally constructed. Our Western views on trash may assume an association with violence, while those found in what we have termed cache pit may not. Thus, viewing these deposits as non-burial features eliminates any preconceived views; however, it does not allow for the tests to determine if some types of modifications are more closely associated with pits defined as refuse, cache, or storage.

8.6.4.1 The Context of 'Structured Deposits'

The contextual location of many of the fragmented and culturally modified human remains was in non-burial features, specifically cache, storage, and/or refuse pits. As discussed previously, the refuse pit location of these remains has led to negative assumptions. However, researchers (Richards and Thomas 1984; Thilderkvist 2013; Hill 1995; Walker 1995) have suggested that archaeologists should not project modern ideas of rubbish or trash on the contents of these deposits. Instead, the features should be viewed as 'structured deposits' (Richards and Thomas 1984; Thilderkvist 2013; Hill 1995) and the cultural materials therein as 'ceremonial trash' (Walker 1995). Thus, cultural materials, including fragmented human bone, found in these

contexts may have functioned to mark important and accessible points on the landscape that served as a form of social memory (Hendon 2000).

Although this treatment has generally been outside of the typical mortuary program (extra-funerary process), It is argued here that it should be included as another possible treatment of human remains for the Oneota. The tertiary and culturally modified human remains represent a transformation. The creation of fragmented and culturally modified human remains extends the maker's personhood into that object as well (Chapman 2000). Therefore, objects can also be considered persons, as they have relationships, biographies, social identities, and contain part of the person that created them (Fowler 2004). It is through exchange that these objects will form a relationship between the giver and the receiver (Chapman 2000; Fowler 2004). It is through a transformation that fragmented and culturally modified human remains were created into objects that may have held (or erased) aspects of the decedent's personhood, the maker's personhood, as well as a newly formed meaning, magic, or power. Both Hedman (2015) and Smith (2015) argued that it is through the final deposition of these objects, possibly through a ritual killing, that their "lives" were ended. Although the objects "life" may have ended with disposal, their placement is specific locations within the village site served to maintain linkages between the dead and the living (Chapman 2000; Hendon 2000).

8.6.5 Summary of Cultural Modification

The data used for this dissertation demonstrated a predominance of isolated cranial elements, followed by long bone fragments. Cultural modification followed this same pattern, with a majority of the modified elements consisting of cranial vault fragments, most frequently the frontal, parietal, and some occipital fragments. These areas correspond to the location of the

soul, above the forehead and hair whorl, as described by Sundstrom (2015). Ideas of the scalp and scalplock may have extended to that location on the skull as well. As taking and burying a scalp, whether from an enemy or friend, symbolized the end of the warpath and the end of the mourning cycle, taking and burying a fragment from this location on the skull could have served a similar purpose.

Due to the important nature of the location of the cranial fragment, those selected for this treatment most likely held some type of high regard or special meaning, either as an individual with high social status within the clan or someone who was a captive or slave, or both. Due to the complex and time intensive process of postmortem processing, a high-status individual was most likely chosen for this treatment (Smith 2015). However, distinguishing if the individual was either an enemy or community member is hard to differentiate. As Smith (2015:280) states, "the inability to distinguish a trophy from an honored decedent is perhaps in itself meaningful."

As discussed, these isolated cranial fragments also often displayed additional modifications (**Table 44**), including burning, incising, and polishing, or combinations thereof. Some more complete elements also display geometric patterns or iconography, such suns or stars, human and animal forms and mythical beings (deities) like birdmen or thunderers (Hedman 2015; Lillie and Schermer 2015a).

Table 44: Context for Human Remains and Cultural Modification by Site

	Hoxie Farm	Morton Village/ Norris Farms 36	Tremaine	Howard Goodhue	McKinney	Wever	Total
Primary Burial	20	203	58	5	0	4	**290**
Secondary Burial	1	1	7	14	0	0	**23**
Tertiary Remains	39	16	28	6	12	6	**107**
Multiple Burial	2	10	1	0	0	0	**13**
Post-Interment Addition	0	2	1	0	0	0	**3**
Primary and Additional Modification	0	0	0	0	0	0	**0**
Primary and Trauma	1	19	2	0	0	0	**22**
Secondary and Additional Modification	0	1	0	0	0	0	**1**
Secondary and Trauma	0	6	0	0	0	0	**6**
Tertiary and Additional Modification	13	0	0	2	7	3	**25**
Tertiary and Trauma	0	0	2	0	1	0	**3**
Multiple/Post-Interment and Additional Modification	0	19	0	0	0	0	**19**
Unknown	11	5	21	0	0	0	**37**
Total	**87**	**282**	**120**	**27**	**20**	**13**	**549**

Although dental remains were excluded in the analysis for this dissertation, culturally modified teeth have been recovered from Oneota sites located in the Red Wing locality of Minnesota and Wisconsin (Blue 2006, 2015). These modifications include grooves or notches along the root. Although sites in Minnesota were excluded from this dissertation based on incomplete data and/or the inaccessibility of Hamline collections due to renovations, the author did examine skeletal remains from other Oneota skeletal collections in Wisconsin. This included the notched teeth and additional skeletal remains from site of Mero/Diamond Bluff housed at the University of Wisconsin-Milwaukee. Although the contexts for these human remains are unknown or lost, cultural modifications were noted. This included the notched roots of teeth as described by Blue (2015), as well as many cranial fragments and mandibles that displayed

cutmarks and/or burning. The cutmarks on some had been attributed to perimortem violence or scalping in their description; however, with only a small fragment this is a difficult determination. Two complete mandibles had cutmarks in areas of ligament and muscle attachment, similar to that found at the Wever site in Iowa. Multiple small linear cutmarks were also found on cranial remains, including two cranial fragments with cutmarks located superior to the external auditory meatus, again suggestive of dismemberment. Numerous small cranial fragments also displayed various levels of burning, from blackened to calcined.

A portion of the skeletal remains recovered from the sites of Brainerd, Furman, Karow, and Overton Meadow were also examined at the University of Wisconsin-Oshkosh. Karston (2015) previously reported on the evidence of violence found at the site, primarily scalping. Unfortunately, contextual information for these sites has either been lost or was not originally recorded, and the skeletal remains were highly fragmented, intermixed, and largely unprovenienced. Thus, these data could not be utilized for this dissertation. However, a portion of the remains were examined by the author. Cultural modification in the form of cutmarks and burning were noted. The cutmarks found on fragmented remains could not be attributed to any cause, but a few intact crania did show evidence of scalping.

Cutmarks are prevalent among Oneota culturally modified human remains. The previously discussed Dixon site in Iowa contained two elements with decorative modifications (Lillie 1999; Lillie and Schermer 2015a). A mostly complete skull displayed marks associated with defleshing. Additionally, a smoothed notch edge design was present along a broken margin of the skull. This notching pattern is unusual and is not seen at any of the other Oneota sites used for this dissertation. As seen in **Figure 54**, an additional frontal bone fragment displays multiple

incised designs: a circle with four cross-hatched points and a body of a bird-like or anthropomorphic figure (Fishel 1999; Lillie 1999; Lillie and Schermer 2015a).

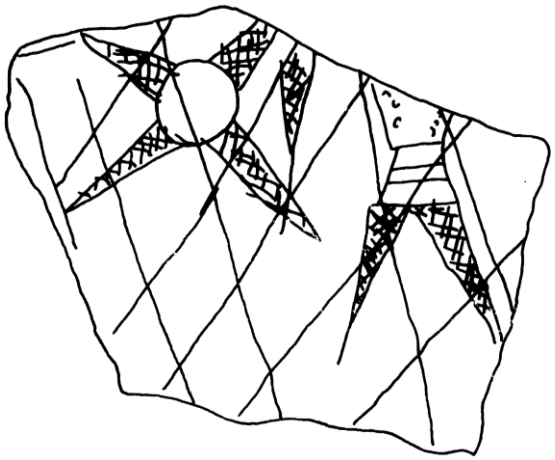

Figure 54: Cranial Fragment with Incising from the Dixon site (Fishel 1999:6)

An additional relatively intact cranium of a young adult female was found in southwestern Iowa (**Figure 55**). This specimen is often referred to as the Nodoway cranium, and although the exact cultural affiliation is unknown, Lillie and Schermer (2015a) noted that the Ioway are known to have camped in this area. The base of the cranium was removed, and the cut edges are smoothed and polished. There are several small incisions as well as two deep cutmarks that extend across the cranium. There are also multiple design motifs, including a bird-like anthropomorphic figure, like that seen on the frontal fragment from the Dixon site; a "forked eye" and a second more incomplete bird-like figure (Lillie and Schermer 2015a:243). A small perforation is seen on the frontal bone, with what looks like the beginning of cross-hatched projections, similar to that seen at the Dixon site (Lillie and Schermer 2015a).

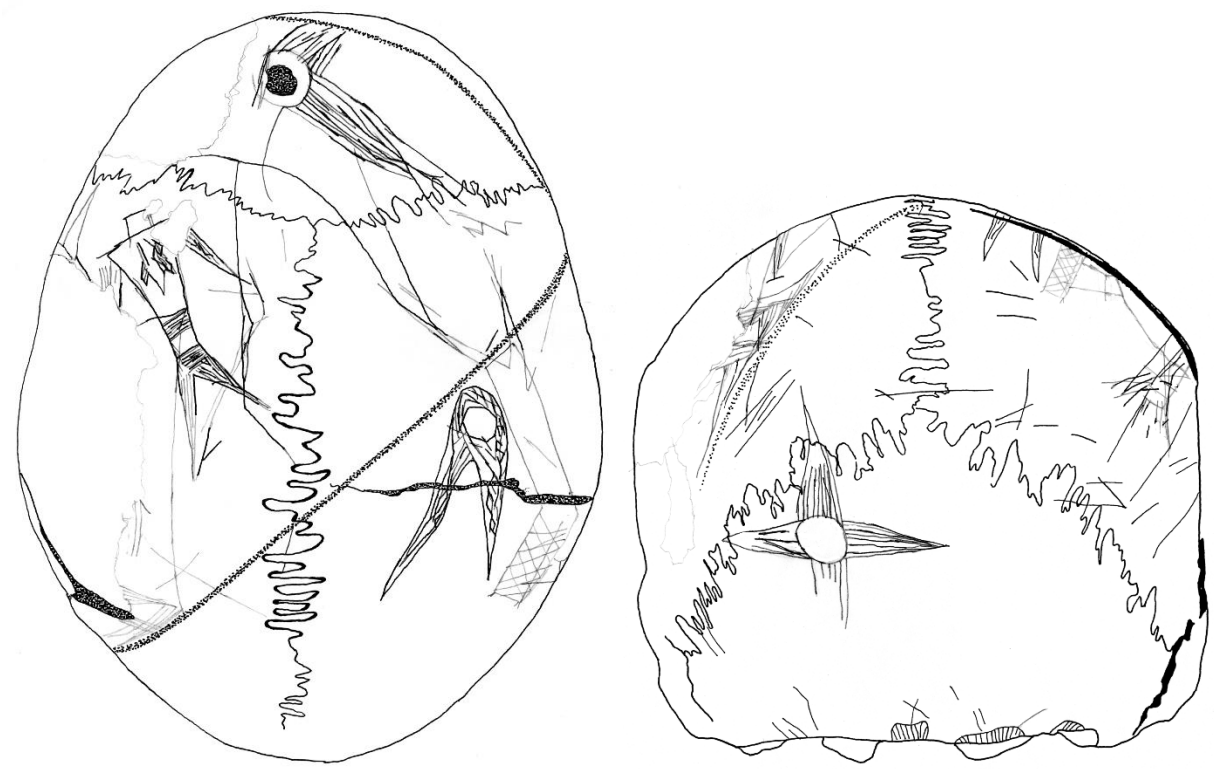

Figure 55: Nodoway Cranium, Superior View (left) and Posterior View (right) (The University of Iowa, Office of the State Archaeologist, drawings by Liz Nic)

Lillie and Schermer (2015a) argued that the Nodoway cranium may demonstrate how smaller cranial fragments were created. Specifically, the Nodoway cranium displays two large, deep incisions or scoring that divide the cranial surface, as well numerous small cutmarks. The large scoring may have eventually been used to segment the cranium into smaller portions, while the smaller cutmarks may have been attributed to defleshing marks, the beginnings of larger designs, or contained meaning in another way (Lillie and Schermer 2015a).

As described earlier, cutmarks are the most common form of cultural modification present at the sites used for analysis. These are most often attributed to dismemberment, scalping, or decorative incising. In addition, evidence of polishing is found on culturally modified human remains. This use-wear is suggestive that these culturally modified human remains had a specific purpose and function within the culture. Human remains, specifically the

cranium, were selected by the Oneota to undergo cultural modification and fragmentation. The cranium was defleshed, scalped, and/or dismembered from the rest of the body. It underwent a process of incising, either as small cuts and/or symbolic images. These objects, either intact or fragmented, were utilized in ceremonies or by the individual, as indicated by evidence of polishing. Finally, burning of the fragment or the deposit it was in may be related to aiding the soul of the deceased into the afterlife. According to Santure (1990b), burning a fire next to the grave of an individual to aid them in the afterlife was common among the historic Winnebago, Missouri, and Oto.

8.7 Research Question 4: Spatial and Temporal Analysis

Oneota sites used for this research span a large geographic and temporal region and represent different phases and foci. Will patterning for the fragmented and/or culturally modified human remains vary at specific temporal, spatial, and/or regional scales?

Multiple interment practices have been noted for the Oneota. Individuals are most often interred in primary extended, supine burials. Secondary burials, often in the form of bundles, are present, but are not as prevalent as primary burials. Both primary and secondary interments are located either within the village or within a separate cemetery (O'Gorman 1995). Isolated human remains have also been frequently encountered at Oneota sites and are most often found in non-burial features within the village. Although this appears to be common for the Oneota, their purpose is still currently unknown. As the Oneota encompass a large regional area and are associated with specific temporal developments, the goal of this research question was to examine if there are any variations in patterning for fragmented and culturally modified human remains due to contextual, spatial, or temporal differences.

8.7.1 Results: Spatial

To examine the possible meanings of the final deposition location of fragmented and culturally modified human remains, a spatial examination was performed using available site maps. Maps generally varied between sites primarily based on the extent of excavations. For example, sites with limited excavations often had more detailed site maps; however, the relationships between tertiary and culturally modified human remains and other site features was more difficult to determine due to the paucity of the site structure. In contrast, sites with more extensive excavations often had less detailed maps which often excluded feature numbers preventing a spatial analysis of the location of these features in relationship to site structure.

Spatial analysis did demonstrate that the context of tertiary and fragmented remains followed two major patterns: mortuary areas (within village, and less commonly cemeteries) and village middens (non-burial features, scatter). Fragmented, and often culturally modified, human remains are found almost exclusively scattered within non-burial features across the site, usually outside of cemeteries, mortuary facilities, mounds, and longhouses.

8.7.2 Interpretation: Spatial

Although intra-mural cemeteries are found at Oneota sites, it appears that within village burial, either within in a structure such as a house or mortuary facility, or generally within the occupation area, are more common (**Table 45**). The development of a separate mortuary area, such as a cemetery, as opposed to intra-mural burial demonstrates "new contrasts to and tensions with the domestic domain," as the complete body and complete objects are more likely to be found in cemeteries (Chapman 2000:229). As Chapman (2000) eludes, the creation of a separate mortuary area, in this case a cemetery, may be in response to a specific event or stress. In the

case of Morton Village and Norris Farms 36, there are multiple possibilities, including an interaction with Middle Mississippian groups that share the site, as well as at least one violent attack. The creation of a defined area may be due to one, or both, of these occurrences.

Table 45: Occurrence of Tertiary and Culturally Modified Human Remains by Interment Practice

		Interments Within Village (Intra-Mural)		
	Interments within a Cemetery	**Within/ Adjacent to House**	**Mortuary Facility**	**Occupation Area**
No Cultural Modification	Norris Farms 36			
Tertiary Remains	Morton Village	Tremaine		
Tertiary Remains and Additional Cultural Modification		McKinney; Armstrong	Howard Goodhue (secondary); Wever (primary); Median (not excavated)	Hoxie Farm

Unfortunately, when examining the sites spatially, sites with detailed site maps were examined spatially, while descriptions were used for those without or with limited site maps. The extent of excavation at sites were vastly different. At sites such as Tremaine and Morton Village/Norris Farms 36 large-scale and/or multiple excavations have uncovered a large area of the site and its boundaries. While at sites such as Howard Goodhue, only portions of the site have been uncovered; thus, complete site structure is still unknown. Although this precluded some comparisons, for most sites, a general mortuary program was established or assumed.

When examining the specific location of fragmented and/or culturally modified human remains, the sites demonstrated that these were primarily found in non-burial features, as opposed to within other interments. Spatial analysis identified these locations on site maps, if applicable to visually compare these locations to other features of the site, such as burials and structures. However, in many instances, the feature numbers were given, but their location on the site was unknown as either site maps did not display this information or they were too detailed and that information was unreadable or unidentifiable. For sites with more detailed maps,

patterns in the location of these remains was demonstrated. For example, at the Howard Goodhue and Wever sites, a clear structure, identified previously as a mortuary structure, can be seen, with secondary burials located within the structure and fragmented human remains in non-burial features outside of the structure. Wever also had longhouse structures, which again, did not contain fragmented human remains within them, but some were located adjacent to the structure. This same patterning can be seen at the Hoxie Farm site. At Tremaine isolated human elements were found with burials, as well as in non-burial features at the site. Finally, the fragmented human remains found at Morton Village were primarily found outside of house structures or in the structure walls. From these sites, it appears that the fragmented or culturally modified human remains are located near, but rarely within structures.

8.7.2.1 Mortuary Customs of the Winnebago and Ioway

When examining the mortuary practices of the Winnebago and Ioway, multiple disposal patterns are noticed. For the Ioway, "primary inhumation and exposure followed by secondary interment" are common, as well as other, less common practices, such as seated burials above ground (O'Gorman 1995:178). Specifically, the Ioway buried their dead in cemeteries or as intrusions in mounds of previous groups (Blaine 1995). Scaffold burial was also once practiced (Skinner 1926). More modern Ioway interments laid the body extended and supine, but older treatments included "bodies flexed and sitting upright" (Skinner 1926:254). "The bodies of the dead were laid on the ground not far from the homes of the deceased, and small shelters or houses build over them, a small door being left at the head of the grave so that food and water might be given to the spirit" (Skinner 1926:254). Similarly, for the Winnebago, primary inhumation and platform burials were practiced (Radin 1970:92). Due to later Algonquian

influences, platform burial disappeared and was replaced with burial-huts placed over graves (Radin 1970).

The Winnebago have two divisions: the *wangeregi herera*, meaning above and referring to the clans named after animals or beings belonging to the above; and the *manegi herera*, meaning earth and referring to the clans named after animals on land and in water. This duality may have influenced burial practices, with those belonging to land and water clans (manegi) receiving a burial within the ground, and those belonging to the above clans (wangeregi) receiving a scaffold burial (Radin 1970). Although each clan had minor variations, for the Winnebago in general the mortuary process involved preparation of the body, rites held in the house of the deceased, speeches to the deceased, rites held at the grave, stories of war exploits at the grave, and a four-nights wake held at the house of the deceased (Radin 1970). During this time, the decedent remained as a spirit so that the deceased could be instructed on how to journey into the next world (Lurie 1994:382).

According to Radin (1970), the Winnebago view death as two processes. Death is seen as an alternate consciousness where the individual goes on in their everyday activities in the after-life and the deceased only recognizes they are dead when they see their body. This state is just like life, but "everything is provided" (Radin 1970:266). The second process is reincarnation. Thus, according to Radin (1970), the Winnebago believe the "soul" is what exists in the afterlife and then is reincarnated on earth in a cyclical process.

For the Ioway, after death the face of the deceased was painted "so that the Great Spirit would know him for an Ioway" (Skinner 1926:255). A wake was performed all night, then the next morning the body was taken to the burial place. A scaffold burial was constructed, or then the grave was dug by members of the other clans. Members of the deceased's clan would cut

their hair and mutilate themselves to show morning (Skinner 1926:255). The souls of the dead traveled over the Milky Way to the city of spirits (Skinner 1926:256).

8.7.3 Summary of Spatial Patterning

Evaluations of the spatial location of fragmentary and culturally modified human remains demonstrated clear associations. The mortuary program of the Oneota has previously been documented to have interments located in separate cemetery locations outside of the village, within or adjacent to structures, and within mortuary facilities. Scattered and isolated human remains are also a common occurrence, although their meaning was still unclear. Although no historic record of this practice can be directly linked to descendant communities, such as the Winnebago and Ioway, fragmentation and cultural modification appear to be one process or stage in the mortuary program.

Previous contextual analyses demonstrated that fragmentary and culturally modified human remains were typically found in non-burial features and as isolates, as well as surface finds. Additionally, some human remains were found in wall trenches and/or postmolds. Locations of non-burial features containing fragmentary and culturally modified human remains were examined using site maps. These demonstrated that a majority of these features were located within or adjacent to structures and/or mortuary facilities. Following a contextual approach outlined by Brück (1995:261), these locations may have been deposited within the settlement area as a way to link the "the living with the land controlled by the dead ancestors." The creation of a cemetery location, especially located outside of the village like that of Norris Farms 36, laid a claim to land, which would have been especially important in areas of intense and violent interactions with neighboring groups. In contrast to cemeteries, the deposition of

interments, as well as bone fragments, in certain locales within the village may have served a similar and symbolic purpose; one that served as a daily reminder of the dead and the ancestors.

8.7.4 Results: Temporal

Sites were also classified temporally by attributed horizon (temporal designation) and phase (material culture designation). For analyses based on horizon, sites were either classified as Emergent (AD 900-1150), Developmental (AD 1150-1350), or Classic (AD 1350-1650). Correspondence analysis showed correlations between Developmental horizon sites and tertiary remains with cutmarks and burning, while Classic horizon sites were associated with trauma, tertiary remains, and tertiary remains with cutmarks.

Correspondence analysis was also used to evaluate any phase associations. Four distinct clusters were noted: Fisher (AD 1100-1350) and Moingona (AD 1100-1400) phases were associated with tertiary remains that were burned and cut; Pammel Creek (AD 1380-1520) and Correctionville (AD 1300-1500) phases were associated with tertiary remains and tertiary remains with trauma; southeastern Iowa and Burlington (AD 1300) phase were associated with tertiary remains with multiple modifications; and Bold Counselor (AD1350-1500) phase was associated with primary, secondary, and multiple burials with trauma.

8.7.5 Interpretation: Temporal

Similar to results obtained by Research Question 3, sites in southeastern Iowa (Burlington phase) associated highly with fragments displaying multiple forms of cultural modification, while cases of trauma were most often associated with Bold Counselor phase. Most sites, although regionally dispersed, were not temporally diverse, with most sites belonging

to either the Developmental or Classic horizon. Thus, any temporal patterns in the data are still unclear.

8.7.6 Summary of Temporal Patterning

Although any temporal patterning was difficult to distinguish, patterning was present in phase comparisons. These results generally confirmed the prior conclusions that evidence of trauma is associated most highly with Norris Farms 36/Morton Village. Tertiary human remains with trauma again associated with the Tremaine site (Pammel Creek phase). The sites of Correctionville and Dixon (Correctionville phase) also had an association with these same types of modification. Additionally, the Howard Goodhue site (Moingona phase) and Hoxie Farm site (Fisher phase) also displayed associations. Currently, no direct link between these phases is known. However, it should be noted that the associations seen in this data may be due to the small sample size for some of the phase categorization.

8.8 Research Question 5: Violence

Research in the Central Illinois River Valley has focused on levels of interaction and violence with neighboring groups (primarily based on one set of sites), but does the level of violence found for the Oneota in the Central Illinois River Valley differ in magnitude or kind with Oneota populations outside this region?

Bioarchaeologists have generally approached violence in the bioarchaeological record through the analysis of skeletal data, reconstructing context, and utilizing social theory (Martin and Harold 2015:119). This research utilized a similar approach. Skeletal data were collected prior to this research and has been previously classified as the result of violence, such as perimortem trauma and scalping, or other modifications, either cultural or natural, if possible to

distinguish. These data were then compared to its context (pit, surface, burial) and its location at the site. Finally, social theories regarding the body, the head, and partibility were utilized.

8.8.1 Results

Correspondence analyses from previous research questions demonstrated that trauma did not associate with other forms of cultural modification, suggesting that these two processes are mutually exclusive. Although fragmented and isolated human remains were found at sites with evidence of violence, culturally modified human remains (with incising, burning, and/or polishing) were not. Of note, the large sites of Tremaine in Wisconsin and Morton Village/Norris Farms 36 display little to no cultural modification, while also having the most evidence of violence as suggested by both antemortem and perimortem scalping and perimortem trauma. This may suggest that regions experiencing high levels of stress due to violence in the region did not participate in the practices of cultural modification of human remains, at least during the time they were experiencing stress. In contrast, sites that do not show great evidence of stress or violence show the highest and more complex modification practices. As cultural modification has been attributed to violence by some researchers, one might argue that those practicing cultural modification are the aggressor. However, if these groups are the aggressor, archaeological evidence of violence still should be present.

8.8.2 Interpretation

Violence and warfare has typically been examined archaeologically using four major classes of evidence: skeletal remains, iconography, the presence of weapons, and settlement structure. Although skeletal evidence has been the primary method of evaluating violence in the

past, these data can be problematic, as not all violence is apparently on the skeleton and individuals experiencing violence may be excluded from the mortuary program. Even when evidence of trauma is identified, there are additional difficulties in separating violence from veneration, accidental injury, or postmortem or taphonomic processes, unless direct evidence of weapons is present, either within the village, as a grave good, or embedded in those killed.

As this research primarily used previously collected data, osteological indicators that were associated with violence could not be re-examined. However, much of the data used for this dissertation was recently collected by experienced osteologists and any indicators of violence noted, such as perimortem trauma or scalping, were included in the data. This dissertation used osteological evidence of violence, but also contextualized this data with ethnographic accounts and archaeological data.

8.8.2.1 Fortifications

Settlement evidence, such as the presence of defensive structures, has often been used to evaluate past violence. This includes sites located in naturally defensible locations or that have fortifications or palisades. While some palisade structures that may have served defensive purposes (e.g. Keeley et al. 2007), others may have served other "social, political, ideological, and symbolic agendas, which at certain times may have overshadowed the defensive functions of these structures" (Schroeder 2006:117). It is therefore important to consider the social implications of having an enclosed village. Although walls may have served a defensive structure, either literally to protect those inside from attack or symbolically as a show of power, they may have also functioned in many other social or practical ways, including protection from elements or wildlife or as an indicator of social control.

Evidence of fortifications at the sites used for this dissertation is scant. The McKinney site in Iowa has historic references to a possible mounded enclosure that would have surrounded the village. Although the timing of its construction and whether it's natural or man-made is still unknown. The Hoxie Farm site in Illinois has the clearest evidence of a fortification. However, only one area of the site has this structure, suggesting that it was either present during a specific occupation of the site or that its use was only for a subset of the population.

8.8.2.2 Religion and Iconography of the Winnebago

Additional evidence, such as iconography and ethnologies of descendants, can elucidate possible meanings behind images and cultural or ritual practices may be identified. Winnebago clans are named after animal forms, with exceptions such as the water spirit and Thunder-bird, which were deities (Radin 1910). "Each clan had its own origin myth, ceremonies, and a large number of customs relating to birth, naming feasts, death and wakes, lists of personal names, obligations, prerogatives, taboos, reciprocal relationships with other clans, and duties to the tribe as a whole" (Lurie 1994:382).

Two clans have specific, important functions for the village: the Thunder-bird (Thunderer) clan and the Bear clan. The chief, who represents peace, was always chosen from the Thunder-bird clan (Radin 1910; Dieterle 2005). The chief "presided over civil functions" and his lodge was located in the center of village with a sacred fireplace for only members of the Thunder-bird clan (Lurie 1994:382; Radin 1910). This lodge functioned as a sanctuary and a place of mediation and reconciliation; it was a place of peace where anyone "could seek sanctuary" (Lurie 1994:382; Radin 1910). Even if escaped captives or murderers came to the

lodge, they would be pardoned and adopted into the Thunder-bird clan (Radin 1910; Dieterle 2005).

The Bear clan had a sacred lodge at the end of the village that held war bundles and scalps (Radin 1910). This clan functioned to regulate the hunt and carrying out orders of the chief (Radin 1910). The men belonging to the Bear clan were referred to as soldiers, "probably in analogy to organized, standing army units at forts" but they were considered "internal police" and carried out "penal functions" (Lurie 1994:382).

Within the historic Winnebago culture, multiple deities exist, many of which relate to clan names and organization. Some of these include the Earth Maker and the Sun, who was the deity of war (Lurie 1978:696). The Thunder-bird is regarded as the deity "granting long life" and peace (Radin 1970:138). The Thunder-bird deity causes lightening with his eyes and thunder with his wings and grants victories in war (Rain 1970). It appears that at some point the Thunder-bird clan divided into two clans: "the real Thunder-bird and the Warrior clan" (Radin 1970:161). The Warrior clan's lodge located at the northwestern area of the village is reported to have contained prisoners (Radin 1970). The Warrior (also called Hawk) clan was in charge of "initiating and leading war parties" (Lurie 1994:382) and "authorized to decree life or death for captives taken in war" (Lurie 1978:693).

Bird-like anthropomorphic images have been seen on Oneota cranial fragments, including the Nodoway cranium and a frontal fragment from the Dixon site, as discussed previously. Birdmen have often been interpreted as relating to warfare and violence (Benn 1989; Hollinger 2005), which has led to assumptions of attributing culturally modified human remains to violence, trophies, or warfare. For example, Benn (1989:252) states "the hawk symbolism is so pervasive in Oneota representations that it must be assumed the warrior theme is being

expressed." However, both the Winnebago and Meskawaki viewed thunderers as benevolent and guardians (Lillie and Schermer 2015a). This is corroborated by Radin (1910), who observes that Thunder-bird clan represented peace and reconciliation.

8.8.2.3 War Among the Winnebago and Ioway

Generally, war was waged by the Winnebago either as a revenge killing or to obtain power or glory (Radin 1970). However, historic accounts of the Winnebago portray them as "exceedingly warlike" (Lurie 1994:382). Many Winnebago ethnographic sources and stories tell of the importance of returning from war with the scalps of slain enemies, either being given a wampum belt or suspending scalps from poles and parading them through the village (Radin 1970; Blowsnake 1997; Longtail 1997). Specifically, many religious type ceremonies were related to aspects of warfare during historic times, as seen in war-bundle ceremonies, in the Victory Dance, and in the Scalp Dance (Lurie 1978:695-696). The Winnebago believed if you died within your house, you will wander the earth, while if you died in war, you will not need anything in the afterlife. However, any wounds received will, so if the deceased was scalped or decapitated, they would remain that way in the afterlife (Blowsnake 1997).

However, (Smith 1997a) stresses that these stories come from or were modified during the post-contact period. By the time Europeans encountered the Winnebago, their population had been severely reduced by "intertribal wars, epidemics, and famine" (Lurie 1994:380). Accounts of a warlike Winnebago reached the French, who sent Jean Nicollet to negotiate peace (Lurie 1978:690). Multiple accounts of hostility and violence do occur during this time and Winnebago accounts of this war period claim that "it was their own treachery of spilling blood in the sanctuary of a chief's lodge that brought supernatural punishments of war, plague, famine, and

near annihilation" (Lurie 1978:692). Through negotiating peace and intermarriage with neighboring Algonkian-speaking tribes, the Winnebago were able to increase their population, restructure their socioeconomic make-up, and began to engage in the fur trade (Lurie 1978:692, 1994:380).

Specifically, the practice of scalping began when the French paid them for scalps. Smith (1997a:119) notes that the pre-contact Winnebago "believed that separating the head from the body would also separate the spirit from the dead person's body" causing the deceased's soul to forever wander. The Winnebago later believed that taking a scalp would result in the deceased's "spirit to serve them in the afterworld" (Smith 1997a:120). After contact with the French, influences from other tribes from the Great Lakes and Plains began the practice of carrying scalps, as noted by Longtail (1997:119), who states that "when Winnebagos return from a warpath, they generally march through the village with the scalps suspended from poles." Radin (1970:113) also reported "frequently the skulls of slain enemies are used as lodge weights and their skin is taken off and used as mats, door-flaps, etc." However, Smith (1997a) cautions that although warfare and violence are prevalent in Winnebago stories, this is a later addition to their cultural norms, after contact. Smith (1997a:148) states "it is not that the Winnebagos wanted to fight; they had to, to protect their families and loved ones."

For the Winnebago, the hok'ixe're dance is performed after every successful return from war. A successful warrior would leave scalps outside of the village then strike them with their clubs to count coup. The dance then used the skulls or scalps from the slain and served to transfer any qualities from the deceased to the victor (Radin 1970).

For the Ioway, after the successful war party returned, the Scalp Dance was performed, in which a white oak tree was cut down, painted red, and made into a war post (Skinner 1915;

1926). Scalps were stretched out on hoops and "dead enemies were shown as headless bodies" and used to dance around the war post (Skinner 1926:204). According to Foster (1994:75), "to capture a scalp was to gain an enemy's soul" which could be given "as a servant to other spirits… or as tribute to the spirits…, especially the Thunderers." War honors were also given, the highest of which was "successful partisan" followed by "foe killer". The third highest honors were given for "coup striker", "head cutter", in which the warrior made the "motions of cutting of the head or nose", "scalper", and "lock taker", in which a lock of hair, as opposed to the entire scalp lock, was taken (Skinner 1926:205).

Although these are clear ceremonies and ritual regarding warfare and violence, again it is cautioned that these stories are from the post-contact period, in which tribes, the Winnebago especially, suffered from epidemics and famine that resulted in population loss. Violence encountered from contact other tribes or Europeans and a need for survival may have helped shape post-contact Ioway and Winnebago into a reliance on warfare.

8.8.3 Summary of Violence

This research does not deny that violence was present in the past. As multiple articles, book chapters and edited volumes have demonstrated, violence has been seen in many forms and in many cultures (e.g. Chacon and Dye 2007; Martin and Frayer 2007; Martin et al. 2012; Martin and Anderson 2014). However, the results of this research caution against attributing cultural modification, or any extra- or post-funerary processes, as solely deviant behavior.

With the exception of Norris Farms 36 and Tremaine, osteological evidence of violence for these sites is scant. Although a few tertiary human remains at other site locations were attributed to scalping, they alternately could have been related to postmortem processing of the

remains. Archaeological evidence of defensive fortifications is also limited. Hoxie Farm has the most compelling evidence for a fortification. However, the presence of a fortification alone is not indicative of violent interactions.

As demonstrated by the historic ethnographic literature on the Winnebago and the Ioway, warfare and scalps played a large part in their religious ceremonies. Although the total impact of Europeans on these customs remains unclear, it is documented by Winnebagos that their customs were modified, and a greater emphasis was placed on war after contact. These same accounts also stress that the Winnebago emphasized peaceful relationships prior to contact.

Iconography seen on culturally modified human remains at Oneota sites often show images of suns and birdmen/thunderers. These images have previously been interpreted as evidence of violence through association of the thunderer as a deity of war (Hollinger 2005). However, the ethnographic literature for the Winnebago suggest the thunderer and the Thunderer clan were benevolent and peaceful. It was only through later interaction with Europeans that the Thunderer clan broke apart into peaceful thunderer and warrior clans. The most suggestive warlike imagery seems to be the sun, which has been documented by the Winnebago to represent the deity of war. These two images of the sun and thunderer often appear together on culturally modified human remains, suggesting a duality between peace and war. These modified remains may have therefore served as a balance and appeasement between these opposing forces.

8.9 Discussion

This dissertation examined the presence of tertiary and culturally modified human remains often found at Oneota sites in the Midwestern United States. Multiple Oneota sites were utilized for this dissertation in order to assess any possible variations in culture and mortuary

practice. Although sites attributed to the Oneota are often based on the presence and type of material culture, such as triangular projectile points and shell-tempered ceramics, variations in site structure and the mortuary program have been noted. For example, longhouses do not generally appear until the Classic Horizon and they are variable in their presence with most evidence for their utilization in southwestern Wisconsin and into eastern Iowa. The mortuary program is also variable with burials located within longhouses or domestic structures, defined cemeteries, or specific mortuary structures. The use of a wide-range of Oneota sites evaluated some of this variability by examining the presence of isolated and culturally modified human remains. Each site utilized had evidence for isolated human remains; however, not all sites contained human remains with other cultural modifications, such as cutmarks, burning, or polishing. The human remains with multiple modifications and specific iconography appear to be mostly located in Iowa, suggesting that this practice was most notable in this region, while cultural modification appears much less in southeastern Wisconsin and Illinois. This additional level of variability within mortuary processing of human remains may require researchers to redefine Oneota or further address how and why this variability is present.

For this dissertation a biocultural bioarchaeological approach utilizing osteological, contextual, and ethnographic data, as well as social theories regarding the body and partibility were used to examine culturally modified human and tertiary human remains at Oneota sites. Following Weiss-Krejci (2011), it is argued that although multiple funerary, post-funerary, and extra-funerary processes may have contributed to the formation of tertiary human remains, it is likely that fragmentary human remains represent an aspect of the Oneota mortuary program that until this dissertation has not yet been fully acknowledged or examined.

Culturally modified material, including Oneota human remains, have often been interpreted as trophies of war or from the result of violence. This research sought to examine other possible explanations and to look at the material from another viewpoint. Specifically, the iconography on Oneota human remains and other material culture has often been attributed to the Thunderer deity. As previously discussed, the ethnographic record from the Winnebago suggest that the Thunderer may have been a benevolent and peaceful deity. However, previous conclusions of violence have often stemmed from iconography from other archaeological cultures, such as the Mississippian birdman or hawk symbol. This "symbolic hawk" is often associated with warriors (Benn 1989; Brown 2007) and this interpretation has been applied not only for Mississippian cultures, but the Oneota as well. Similarities seen in images of the Oneota Thunderer and the Mississippian birdman or hawk have led to conclusions that this image is representative of warfare for both archaeological cultures. This dissertation proposes an alternative view on the Thunderer and suggests that this imagery may not be consistent in its meaning as other researchers have assumed. Although clear associations between this image and war is seen in Mississippian cultures, such as holding decapitated heads or war clubs, this type of association is not as clear for the Oneota. This dissertation instead argues that the noted amount of variability within the Oneota culture may influence the meaning of these images. Similarities in imagery between Oneota and Mississippian cultures may have arisen due to contact or they may represent two distinct ideas that were created independently from one another.

Although it is still unknown exactly *who* could be included for fragmentation and modification, the individuals and elements used for this process were specific: the head of an adult individual. Beginning with death, the body, or more specifically, the cranium, underwent a process of transformation. After defleshing, the cranium of the individual appears to have first

been incised with symbolic images using general small, shallow nicks, followed by fragmentation. The creation of the modified cranium creates a new personhood, one that is projected from the maker to the object (Chapman 2000). This is demonstrated historically among the Winnebago through the hok'ixe're dance occurring after a successful war party. This ceremony allowed for transfer of desirable characteristics of the slain individual to the victor through scalps (Radin 1923). A similar transference of characteristics and identify may have occurred through the creation and disposal of fragmented and culturally modified human remains for the Oneota.

As only fragments of these individuals remained, it is likely that these remains served a specific function: to create relationships with ancestors and/or the living. An additional transformation through fragmentation occurred and functioned to create and maintain relationships between the living, the newly dead, and the ancestors (Chapman 2000). Each fragment retained aspects of identify and personhood and could be exchanged among the living, creating relationships between these individuals and groups (Mauss 1966). In this way, these fragments not only represent these relationships, but are also a piece of the individual, either the decedent, the maker, or both (Mauss 1966; Chapman 2000). Therefore, the fragmentation and exchange (as viewed by Mauss 1966) or enchainment (as viewed by Chapman 2000) of objects and human remains demonstrates that "objects transmit not only the symbolism of their complete, once-intact form but also the enchained, or fractal, connotations of the past markers and owners" (Chapman 2000:39). This symbolism may have functioned in a variety of ways, including representing relationships between individuals or ancestors. Additionally, it may have served to identify the person in possession of the object as belonging to a specific clan, ancestor, or group. This is an especially compelling argument when examining the Thunderer imagery on

human remains, as it may have served as a representation of that deity or as a membership to the Thunderer clan.

At the end of the use-lives, modified and tertiary human remains were deposited in non-burial features. Some of these features were refuse pits, which has in some instances led to an assumption of violence. Although there is an assumption that a refuse deposit or midden has negative connotations for the individual placed within, deeper meanings may be at play. Ethnographic resources regarding descendant groups, such as the Winnebago, have discussed the importance of enemy scalps in war raids; however, these have generally been influenced by contact with Europeans and other Native groups. And although this may be one possible explanation for culturally modified and fragmented human remains, any violence is most likely the result of what Duncan (2005) termed positive predation, in which the vitality and essence of the deceased individual are utilized. This research therefore serves to provide an alternative explanation of a transformation and cautions against conclusions of violence without evaluation of alternatives.

The contextual location of the human remains also aids in this interpretation. The final deposition of the tertiary and culturally modified human remains tends to be adjacent and usually outside of a structure within the village site. Removal of certain bones and placing them in specific locations, such as middens or domestic contexts, is a way of "keeping the essence of the dead alive through the materiality of their bones" (Chapman 2000:145). The specific location of final deposition within the settlement, but outside of the house, functioned as a way to link the living to the land and their ancestors (Brück 1995; Chapman 2000). Each fragment was deposited in a specific location on the site, creating a place-value, a link from the deceased individual (ancestor) to the living (Chapman 2000).

8.10 Conclusion

Scattered human remains have been found at many Oneota sites. Although it is easy to dismiss or ignore these remains due to their difficulty in interpretation, this research sought to examine these fragments in terms of a process of transformation. The Oneota processed their dead and interred them in a variety of locales. Within this variation in interment, however, is the presence of isolated human remains, some of which are culturally modified. Exactly who the fragmentary remains once belonged to is still unknown, but it is argued that these human remains represent a previously unrecognized stage in the mortuary program: a transformation of the dead. Cranial elements were preferred for this process due to the association between the cranium and the soul. These elements were transformed through modification, depicting dualistic imagery of peace (thunderer) and war (sun). Although some communities may have been experiencing violence, these groups do not appear to have practiced cultural modification, at least to the degree that communities with more peaceful interactions with neighbors were.

8.11 Future Research

Due to the numerous difficulties with the data, this research should be expanded upon as more Oneota excavations occur. Sites included in this research were limited due to several criteria that were required for inclusion, such as the presence of fragmentary and/or culturally modified human remains. Future analyses may add additional Oneota sites that do not demonstrate one or more of these criteria in order to increase sample size, as well as evaluate where sites with no cultural modified human remains fit into the interpretations provided in this dissertation. This also includes a more complete investigation of the contextual data for these sites, which will require analyses of the notes taken in the field.

It may also be useful to further investigate the iconography seen on some of the Oneota cranial remains and other artifacts, especially in regards to Mississippian culture. Additionally, faunal remains in many archaeological cultures are also modified, and these were not included in this research, but could aid in the understanding of the modification of human bone.

APPENDICES

APPENDIX A: DATA COLLECITON FORM

Institution:
Skeleton/Fragment #:
Date:

Total Completeness: 1 (>75% complete) 2 (25-75% partial) 3 (<25% poor)

SEX _____

Pelvis: Sex: _____

Ventral Arc	F	M			
Subpubic Concavity	F	M			
Ischiopubic Ramus Ridge	F	M			
Greater Sciatic Notch	1	2	3	4	5
Pre-auricular Sulcus	P / A	1	2	3	4

Skull: Sex: _____

Nuchal Crest	1	2	3	4	5
Matoid Process	1	2	3	4	5
Supraorbital Margin	1	2	3	4	5
Supraorbital Ridge/Glabella	1	2	3	4	5
Mental Eminence	1	2	3	4	5

AGE _____

Pelvis: Age: _____

Suchey-Brooks	1	2	3	4	5	6			Age: _____
Auricular Surface	1	2	3	4	5	6	7	8	Age: _____

Axial:

Sternal Rib End	1	2	3	4	5	6	7	8	Age: _____
Cranial Sutures	0 (open)	1 (minimal)		2 (significant)		3 (complete)			Age: _____

Subadult: Epiphyseal Union

PATHOLOGY

Bone Location Description

TAPHONOMY

Weathering, Sedimentation, Roots, Insect, Rodent, Carnivore, Polish

Bone Location Description

TRAUMA

Ante-, Peri-, Post-mortem; Cutmarks (#, depth, range, sketch)

Bone Location Description

CULTURAL MODIFICATION

Acquisition, Manufacturing, Use-wear, Abandonment

Bone Location Description

APPENDIX B: CODED DATA

State	Site	Horizon	Phase	Age	Sex	Deposit	Context	Position1	Position2	Context & Presence CultMod	Cranial	Postcranial	Both Cranial & PC	Presence CultMod	Where Mod	Type Mod	All Mod	Type Cutmark	Specific Mod	Context & Type Mod	Context & Type Mod 2
1	1	3	3	4	2	2	5			4	1	0	0	0	0	0	0	0	0	1	1
1	1	3	3	5	3	2	5			4	1	0	0	0	0	0	0	0	0	1	1
1	1	3	3	8	2	2	5			4	1	0	0	0	0	0	0	0	0	1	1
1	1	3	3	3	2	4	5			4	1	0	0	0	0	0	0	0	0	1	1
1	1	3	3	8	3	4	5			4	1	0	0	0	0	0	0	0	0	1	1
1	1	3	3	3	2	4	5			4	1	0	0	0	0	0	0	0	0	1	1
1	1	3	3	5	3	4	5			4	0	1	0	0	0	0	0	0	0	1	1
1	1	3	3	8	1	2	5			4	0	1	0	0	0	0	0	0	0	1	1
1	1	3	3	5	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
1	1	3	3	9	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
1	1	3	3	8	2	4	5			4	0	1	0	0	0	0	0	0	0	1	1
1	1	3	3	3	2	4	5			4	0	0	1	0	0	0	0	0	0	1	1
1	1	3	3	3	2	2	5			1	1	0	0	1	1	2	2	2	2	9	5
1	1	3	3	5	2	2	5			1	0	0	1	1	1	1	3	0	3	13	8
1	1	3	3	4	2	2	5			1	1	0	0	1	1	4	4	0	4	15	10
1	1	3	3	5	2	3	5			1	1	0	0	1	1	4	5	4	5	16	11
1	1	3	3	8	2	2	5			1	1	0	0	1	1	4	7	4	7	18	13
1	1	3	3	8	2	3	5			1	1	0	0	1	1	4	7	1	8	18	13
1	1	3	3	5	2	3	5			1	1	0	0	1	1	4	12	0	12	19	14
1	1	3	3	5	2	2	5			1	0	0	1	1	1	4	6	4	11	17	12
1	2	2	3	9	2	2	5			4	1	0	0	0	0	0	0	0	0	1	1
1	2	2	3	9	2	2	5			4	1	0	0	0	0	0	0	0	0	1	1
1	2	2	3	8	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1

1	2	2	3	8	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
1	2	2	3	8	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
1	2	2	3	8	2	3	5			4	0	1	0	0	0	0	0	0	0	1	1
1	2	2	3	9	2	1	1			5	1	0	0	0	0	0	0	0	0	2	0
1	2	2	3	8	2	1	1			5	1	0	0	0	0	0	0	0	0	2	0
1	2	2	3	8	2	1	1			5	0	1	0	0	0	0	0	0	0	2	0
1	2	2	3	8	2	1	1	1	4	5	0	0	1	0	0	0	0	0	0	2	0
1	2	2	3	8	2	2	5			1	1	0	0	1	1	2	2	4	1	7	4
1	2	2	3	8	1	2	5			1	1	0	0	1	1	4	6	3	6	17	12
1	2	2	3	6	2	2	5			1	1	0	0	1	1	4	11	4	11	17	12
1	3	2	5	5	2	2	5			4	1	0	0	0	0	0	0	0	0	1	1
1	3	2	5	8	2	2	5			4	1	0	0	0	0	0	0	0	0	1	1
1	3	2	5	9	2	4	5			4	1	0	0	0	0	0	0	0	0	1	1
1	3	2	5	5	2	4	5			4	1	0	0	0	0	0	0	0	0	1	1
1	3	2	5	4	2	3	5			4	1	0	0	0	0	0	0	0	0	1	1
1	3	2	5	8	2	4	5			4	0	1	0	0	0	0	0	0	0	1	1
1	3	2	5	6	2	1	1	1	2	5	1	0	0	0	0	0	0	0	0	2	0
1	3	2	5	6	1	1	1	1	2	5	1	0	0	0	0	0	0	0	0	2	0
1	3	2	5	5	3	1	1	1	2	5	0	0	1	0	0	0	0	0	0	2	0
1	3	2	5	6	1	1	1	1	2	5	0	0	1	0	0	0	0	0	0	2	0
1	3	2	5	3	2	1	1	9	9	5	0	0	1	0	0	0	0	0	0	2	0
1	3	2	5	8	1	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	6	3	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	5	2	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	6	3	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	2	2	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	2	2	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	8	2	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	5	3	1	2			6	1	0	0	0	0	0	0	0	0	3	0
1	3	2	5	5	3	1	2			6	1	0	0	0	0	0	0	0	0	3	0

1	3	2	5	8	3	1	2			6	0	1	0	0	0	0	0	0	0	3	0
1	3	2	5	3	2	1	2			6	0	1	0	0	0	0	0	0	0	3	0
1	3	2	5	5	2	1	2			6	0	0	1	0	0	0	0	0	0	3	0
1	3	2	5	4	2	1	2			6	0	0	1	0	0	0	0	0	0	3	0
1	3	2	5	4	2	1	2			6	0	0	1	0	0	0	0	0	0	3	0
1	3	2	5	6	2	2	5			1	1	0	0	1	1	2	2	4	1	7	4
1	3	2	5	9	2	2	5			1	1	0	0	1	1	1	3	0	3	13	8
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2	4	3	2	8	2	4	5			4	1	0	0	0	0	0	0	0	0	1	1
2	4	3	2	9	2	4	5			4	1	0	0	0	0	0	0	0	0	1	1
2	4	3	2	8	2	4	5			4	1	0	0	0	0	0	0	0	0	1	1
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2	4	3	2	8	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
2	4	3	2	8	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
2	4	3	2	8	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
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2	4	3	2	4	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
2	4	3	2	8	2	2	5			4	0	1	0	0	0	0	0	0	0	1	1
2	4	3	2	8	2	4	5			4	0	1	0	0	0	0	0	0	0	1	1
2	4	3	2	9	2	4	5			4	0	1	0	0	0	0	0	0	0	1	1

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2	4	3	2	8	2	4	5			4	0	1	0	0	0	0	0	0	0	1	1
2	4	3	2	8	2	4	5			4	0	1	0	0	0	0	0	0	0	1	1
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2	4	3	2	4	2	1	1	1	1	5	0	0	1	0	0	0	0	0	0	2	0
2	4	3	2	6	1	1	1	1	1	5	0	0	1	0	0	0	0	0	0	2	0
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2	4	3	2	7	1	1	1	1	1	5	0	0	1	0	0	0	0	0	0	2	0
2	4	3	2	2	2	1	1	1	1	5	0	0	1	0	0	0	0	0	0	2	0

2	4	3	2	7	1	1	1	1	1	5	0	0	1	0	0	0	0	0	0	2	0
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2	4	3	2	7	1	1	1	1	1	5	0	0	1	0	0	0	0	0	0	2	0
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2	4	3	2	3	2	1	2	2		6	0	0	1	0	0	0	0	0	0	3	0
2	4	3	2	2	2	1	3			7	1	0	0	0	0	0	0	0	0	4	0
2	4	3	2	2	2	1	3			7	1	0	0	0	0	0	0	0	0	4	0
2	4	3	2	2	2	1	9			11	1	0	0	0	0	0	0	0	0	5	0
2	4	3	2	1	2	1	9			11	1	0	0	0	0	0	0	0	0	5	0
2	4	3	2	8	2	1	9	9	9	11	1	0	0	0	0	0	0	0	0	5	0
2	4	3	2	2	2	1	9			11	0	1	0	0	0	0	0	0	0	5	0
2	4	3	2	3	2	1	9			11	0	0	1	0	0	0	0	0	0	5	0
2	4	3	2	1	2	1	9			11	0	0	1	0	0	0	0	0	0	5	0
2	4	3	2	8	2	1	9			11	0	0	1	0	0	0	0	0	0	5	0
2	4	3	2	1	2	1	9			11	0	0	1	0	0	0	0	0	0	5	0
2	4	3	2	6	3	1	9			11	0	0	1	0	0	0	0	0	0	5	0
2	4	3	2	3	2	1	9			11	0	0	1	0	0	0	0	0	0	5	0
2	4	3	2	8	2	1	9			11	0	0	1	0	0	0	0	0	0	5	0
2	4	3	2	8	2	2	5			1	1	0	0	1	1	2	2	4	1	7	4
2	4	3	2	9	2	2	5			1	1	0	0	1	1	2	2	4	1	7	4
2	4	3	2	8	2	2	5			1	0	0	1	1	1	2	2	4	1	7	4
2	4	3	2	8	2	2	5			1	0	0	1	1	1	4	2	1	9	7	4
2	4	3	2	6	3	1	1	1	1	2	0	0	1	1	1	2	2	2	2	10	3
2	4	3	2	8	2	2	5			1	1	0	0	1	1	1	3	0	3	13	8
2	4	3	2	8	2	4	5			1	1	0	0	1	1	1	3	0	3	13	8
2	4	3	2	8	2	4	5			1	1	0	0	1	1	1	3	0	3	13	8
2	4	3	2	8	2	2	5			1	0	0	1	1	1	1	3	0	3	13	8
2	4	3	2	8	2	2	5			1	0	0	1	1	1	1	3	0	3	13	8

2	4	3	2	8	2	2	5			1	0	1	0	1	2	1	3	0	3	13	8
2	4	3	2	8	2	2	5			1	0	1	0	1	2	1	3	0	3	13	8
2	4	3	2	8	2	2	5			1	0	1	0	1	2	1	3	0	3	13	8
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3	6	3	4	4	2	1	1	3	1	5	0	0	1	0	0	0	0	0	0	2	0
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3	6	3	4	9	2	1	1	1	1	5	0	0	1	0	0	0	0	0	0	2	0
3	6	3	4	2	2	1	3		9	5	0	0	1	0	0	0	0	0	0	2	0
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3	6	3	4	5	2	1	2		1	6	0	0	1	0	0	0	0	0	0	3	0
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3	6	3	4	2	2	1	9	9	9	11	0	0	1	0	0	0	0	0	0	5	0
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3	6	3	4	9	2	2	5			1	0	0	1	1	1	2	2	2	2	9	5
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3	6	3	4	4	2	1	1	1	1	2	0	0	1	1	1	2	2	2	2	10	3
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1	8	3	6	7	2	9	5			4	9	9	9	0	0	0	0	0	0	1	1
1	8	3	6	4	2	9	5			4	9	9	9	0	0	0	0	0	0	1	1
1	8	3	6	6	3	9	5			4	9	9	9	0	0	0	0	0	0	1	1
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1	8	3	6	6	1	1	1	1		5	9	9	9	0	0	0	0	0	0	2	0
1	8	3	6	6	3	9	5			1	0	1	0	1	2	2	2	3	13	7	4
1	8	3	6	4	2	9	5			1	0	1	0	1	2	2	2	3	13	7	4
1	8	3	6	4	2	9	5			1	1	0	0	1	1	2	2	5	14	16	11

1	9	3	6	4	2	2	5			4	9	9	9	0	0	0	0	0	0	1	1
1	9	3	6	5	2	9	5			4	9	9	9	0	0	0	0	0	0	1	1
1	9	3	6	5	3	9	5			4	9	9	9	0	0	0	0	0	0	1	1
1	9	3	6	6	2	9	5			4	9	9	9	0	0	0	0	0	0	1	1
1	9	3	6	2	2	3	5			4	9	9	9	0	0	0	0	0	0	1	1
1	9	3	6	8	2	3	5			4	9	9	9	0	0	0	0	0	0	1	1
1	9	3	6	8	2	9	5			4	9	9	9	0	0	0	0	0	0	1	1
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1	9	3	6	9	2	9	5			1	1	0	0	1	1	2	2	1	9	7	4
1	9	3	6	9	2	3	5			1	1	0	0	1	1	2	2	1	9	7	4
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2	10			9	2	1	5			1	0	1	0	1	2	5	8	0	16	20	15
2	10			9	2	1	5			1	0	1	0	1	2	5	8	0	16	20	15
1	11			9	2	9	5			1	1	0	0	1	1	2	2	0	9	7	4
1	12			9	2	9	5			1	1	0	0	1	1	2	2	2	2	9	5
1	13			9	2	9	5			1	1	0	0	1	1	2	2	3	13	7	4
1	14			9	2	9	5			1	1	0	0	1	1	5	8	0	16	20	15
1	15			8	2	9	5			1	1	0	0	1	1	4	5	5	15	16	11
1	16			9	2	9	5			1	1	0	0	1	1	2	2	3	13	7	4
1	16			9	2	9	5			1	1	0	0	1	1	2	2	3	13	7	4
1	16			9	2	9	5			1	0	1	0	1	2	2	2	4	16	20	15
1	17			8	2	9	5			1	1	0	0	1	2	1	3	4	1	7	4
1	17			9	2	9	5			1	1	0	0	1	1	1	3	0	3	13	8
1	17			9	2	9	5			1	1	0	0	1	1	1	3	0	3	13	8
1	18			3	2	9	5			1	1	0	0	1	1	2	2	3	13	7	4
1	19			9	2	9	5			1	0	1	0	1	2	2	2	3	13	7	4

1	19			9	2	9	5			1	0	1	0	1	2	2	2	3	13	7	4
1	19			9	2	9	5			1	0	1	0	1	2	2	2	3	13	7	4
1	19			9	2	9	5			1	0	1	0	1	2	2	2	3	13	7	4
1	20			5	1	9	1	1		2	0	1	0	1	2	2	2	3	13	8	2
1	21			6	3	9	5			1	0	1	0	1	2	2	2	3	13	1	1

APPENDIX C: DATA CODING KEY

The following coding system was used to for this dissertation. Coded data can be found in Appendix B.

State
1 = Iowa
2 = Illinois
3 = Wisconsin

Site
1 = McKinney
2 = Wever
3 = Howard Goodhue
4 = Hoxie Farm
5 = Morton Village and Norris Farms 36 Cemetery
6 = Tremaine
7 = Armstrong
8 = Correctionville
9 = Dixon
10 = Anker
11 = Adams Co (Nodoway)
12 = Dawson
13 = Wildcat
14 = Lane Farm/Grant Village
15 = Schmeiser
16 = Blood Run
17 = 13MA207
18 = 13MA209
19 = Flatiron Terrace
20 = O'Regan Terrace
21 = 13AM60

Horizon
1 = Emergent
2 = Developmental
3 = Classic
4 = Historic

Phase
1 = Bold Counselor
2 = Fisher, Upper Mississippian
3 = SE Iowa, Burlington
4 = Pammel Creek
5 = Moingona

6 = Correctionville
7 = Red Wing
9 = Unknown

Age
1 = Fetal (< birth)
2 = Infant (birth – 3 years)
3 = Child (3 – 12 years)
4 = Adolescent (12 – 20 years)
5 = Young Adult (20 – 35 years)
6 = Middle Adult (35 – 50 years)
7 = Old Adult (> 50 years)
8 = Adult (age unknown)
9 = Unknown

Sex
1 = Male
2 = Indeterminate
3 = Female
9 = Unknown

Deposit
1 = Burial
2 = Non-burial Feature
3 = Surface
4 = Isolate
5 = House fill/wall trench
9 = Unknown

Context
1 = Primary
2 = Secondary
3 = Multiple
4 = Post-interment addition
5 = Tertiary
9 = Unknown

Position 1
1 = Extended
2 = Supine
3 = Reclined/semi-reclined
4 = Flexed/semi-flexed
9 = Unknown

Position 2
1 = Supine

2 = Prone
3 = Side
9 = Unknown

Context & Presence of Cultural Modification
1 = Tertiary and additional cultural modification
2 = Primary and cultural modification
3 = Secondary and additional cultural modification
4 = Tertiary
5 = Primary
6 = Secondary
7 = Multiple
8 = Multiple and cultural modification
9 = Post-interment addition
10 = Post-interment addition and cultural modification
11 = Unknown
12 = Unknown and cultural modification

Cranial
0 = No
1 = Yes
9 = Unknown

Postcranial
0 = No
1 = Yes
9 = Unknown

Both Cranial and Postcranial
0 = No
1 = Yes
9 = Unknown

Presence CultMod
0 = No
1 = Yes
9 = Unknown

Where Mod
0 = None
1 = Cranial
2 = Postcranial
3 = Both
4 = Mandible
9 = Unknown

Type Mod
0 = None
1 = Burning
2 = Cutmarks
3 = Polishing
4 = Multiple
5 = Other
9 = Unknown

All Mod
0 = None
1 = Polishing
2 = Cutmarks
3 = Burning
4 = Burning and polishing
5 = Cutmarks and polishing
6 = Burning and cutmarks
7 = Burning, cutmarks, polishing
8 = Other

Type Cutmark
0 = None
1 = Incising
2 = Scalping
3 = Dismemberment
4 = Unknown cutmark
5 = Multiple types of cutmarks

Specific Mod
0 = none
1 = Unknown cutmarks
2 = Scalping
3 = Burning
4 = Burning, polishing
5 = Unknown cutmarks, polishing
6 = Burning, dismemberment
7 = Burning, polishing, unknown cutmarks
8 = Burning, polishing, incising
9 = Incising
10 = Burning, incising
11 = Burning, unknown cutmarks
12 = Polishing
13 = Dismemberment
14 = Polishing, dismemberment, unknown cutmarks
15 = Polishing, dismemberment, incising

16 = Worked bone (notched, punctured)
17 = Perimortem trauma
18 = Scalping, perimortem trauma

Context and Type Mod

0 = None
1 = Tertiary
2 = Primary
3 = Secondary
4 = Multiple
5 = Unknown
6 = Post-interment addition
7 = Tertiary and cutmarks
8 = Primary and cutmarks
9 = Tertiary and scalping
10 = Primary and scalping
11 = Secondary and scalping
12 = Unknown and scalping
13 = Tertiary and burning
14 = Secondary and burning
15 = Tertiary, burning, polishing
16 = Tertiary, cutmarks, polishing
17 = Tertiary, burning, cutmarks
18 = Tertiary, burning, cutmarks, polishing
19 = Tertiary and polishing
20 = Tertiary and worked bone (notched, punctured)
21 = Primary and perimortem trauma
22 = Secondary and perimortem trauma
23 = Multiple and perimortem trauma
24 = Post-interment and perimortem trauma
25 = Primary, scalping, trauma
26 = Secondary, scalping, trauma
27 = Multiple, scalping, trauma
28 = Post-interment, scalping, trauma

Context and Type Mod 2

0 = None
1 = Tertiary
2 = Primary and cutmarks
3 = Primary and trauma
4 = Tertiary and cutmarks
5 = Tertiary and trauma
6 = Secondary/Unknown and trauma
7 = Multiple/Post-interment addition and trauma
8 = Tertiary and burning
9 = Secondary and burning

10 = Tertiary, burning, polishing
11 = Tertiary, cutmarks, polishing
12 = Tertiary, burning, cutmarks
13 = Tertiary, burning, cutmarks, polishing
14 = Tertiary and polishing
15 = Tertiary and worked bone (notched, punctured)

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