

5-1-2020

## Excavating Gender: The Embodiment and (Re)presentation of Social Relations in Mierzanowice Communities of the Early Bronze Age

Mark Paul Toussaint

Follow this and additional works at: <https://digitalscholarship.unlv.edu/thesesdissertations>



Part of the [Archaeological Anthropology Commons](#), [Feminist, Gender, and Sexuality Studies Commons](#), and the [Gender and Sexuality Commons](#)

---

### Repository Citation

Toussaint, Mark Paul, "Excavating Gender: The Embodiment and (Re)presentation of Social Relations in Mierzanowice Communities of the Early Bronze Age" (2020). *UNLV Theses, Dissertations, Professional Papers, and Capstones*. 3966.

<http://dx.doi.org/10.34917/19412187>

This Dissertation is protected by copyright and/or related rights. It has been brought to you by Digital Scholarship@UNLV with permission from the rights-holder(s). You are free to use this Dissertation in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/or on the work itself.

This Dissertation has been accepted for inclusion in UNLV Theses, Dissertations, Professional Papers, and Capstones by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact [digitalscholarship@unlv.edu](mailto:digitalscholarship@unlv.edu).

EXCAVATING GENDER: THE EMBODIMENT AND (RE)PRESENTATION  
OF SOCIAL RELATIONS IN MIERZANOWICE COMMUNITIES  
OF THE EARLY BRONZE AGE

By

Mark Paul Toussaint

Bachelor of Science – Physics  
Indiana University  
2003

Master of Arts – Anthropology  
University of California Riverside  
2012

A dissertation submitted in partial fulfillment  
of the requirements for the

Doctor of Philosophy – Anthropology

Department of Anthropology  
College of Liberal Arts  
The Graduate College

University of Nevada, Las Vegas  
May 2020

Copyright 2020 Mark Toussaint

All Rights Reserved

**Dissertation Approval**

The Graduate College  
The University of Nevada, Las Vegas

April 9, 2020

This dissertation prepared by

Mark Paul Toussaint

entitled

Excavating Gender: The Embodiment and (Re)presentation of Social Relations in  
Mierzanowice Communities of the Early Bronze Age

is approved in partial fulfillment of the requirements for the degree of

Doctor of Philosophy – Anthropology  
Department of Anthropology

Debra Martin, Ph.D.  
*Examination Committee Chair*

Kathryn Hausbeck Korgan, Ph.D.  
*Graduate College Dean*

Pierre Lienard, Ph.D.  
*Examination Committee Member*

Barbara Roth, Ph.D.  
*Examination Committee Member*

Elsbeth Whitney, Ph.D.  
*Graduate College Faculty Representative*

## **ABSTRACT**

### **Excavating Gender: The Embodiment and (Re)presentation of Social Relations in Mierzanowice Communities of the Early Bronze Age**

by

Mark Paul Toussaint

Dr. Debra Martin, Examination Committee Chair  
Distinguished Professor of Anthropology  
University of Nevada, Las Vegas

The construction of gender in a society is based on a discursive relationship between culture and biology. Ideological components are often translated into structural factors, which condition access to social and biological resources and exposure to risk. Cumulative differential health outcomes for groups can become embodied in ways that affect the skeleton. By conducting population-level analyses of skeletal markers of health and trauma, bioarchaeologists work backwards to attempt to reconstruct social conditions. Archaeological and mortuary context is an important part of this process.

Cemeteries of the Mierzanowice Culture (MC) in southern Poland (~2300-1600 BCE) offer a unique opportunity to study gender in prehistory. Burials in these cemeteries have been described as “bipolar” in orientation, with males and females aligned to opposite points of the compass in mirror-image poses. This study seeks to understand whether the apparent, idealized gender distinctions in MC communities became gender stratification in practice, and whether indeed these distinctions are as binary as they may first appear. The excavated portions of four MC cemeteries in southeastern Poland were examined, for a sample size of 178 individuals. In addition to sex and age estimation, data were gathered

pertaining to biomechanical stresses (enthesal robusticity, osteoarthritis), signs of chronic disease or nutritional insufficiency, and trauma.

Results suggest that gender was at least not the primary factor with regard to the intensity of habitual labor, nor were divisions of labor so distinct that they could be clearly ascertained through patterns of enthesal robusticity. Patterns of trauma, however, suggest that while males may have experienced more occupational or accidental injuries, young adult females experienced higher rates of interpersonal violence. Finally, examination of mortuary context and anthropological data preliminarily supports the interpretation of a more nuanced approach to gender in MC communities than a static gender binary, including changes in gender roles or possibilities over the life course and potential gender variant categories (e.g., third genders or gender variants).

## **ACKNOWLEDGEMENTS**

I would like to sincerely thank Dr. Debra Martin, my mentor and dissertation advisor for her guidance, support, and patience throughout my PhD program. I am forever grateful that she saw potential in me as an applicant and decided to take me under her wing. She constantly inspired and motivated me to think bigger, to seize and create opportunities, and to be my best academic self. I am also indebted to my committee members, Dr. Pierre Liénard, Dr. Barbara Roth, and Dr. Elspeth Whitney for their encouragement, their time, and their feedback.

My dissertation research would not have been possible without the support, assistance, and generosity of Dr. Piotr Włodarczak, Dr. Krzysztof Tunia, Dr. Sławomir Kadrow, Dr. Hanna Kowalewska-Marszałek, Dr. Justyna Baron, and Dr. Dalia Pokutta. These, my Polish mentors and colleagues, provided access to skeletal collections, archaeological documentation, and accommodation, along with advice and guidance. They, along with friends and loved ones—in particular Jacek Karmowski and (soon to be Dr.) Anna Chmielowska—helped to make Poland a second home to me.

I am also thankful for the financial support of the university, the Graduate College, and the Department of Anthropology. This research was funded in part through grants and scholarships such as the UNLV Summer Faculty Research Stipend, the Edwards & Olswang Grant, the Friends of World Anthropology Scholarship, and the UNLV International Programs Scholarship. I am particularly grateful for the generosity of the family of Angela Peterson and their support of grants and scholarships within the Department of Anthropology.

Finally, and most of all, I cannot adequately express my eternal gratitude and love for my family—my mother, father, and brothers—and for their unwavering support. Not only could I not have dreamt to achieve my goals academically without them, but more importantly, I would not be the person I am today. Their examples of selflessness, generosity, love, and compassion continue to inspire me to be a better person every day. I love you all more than I can say.



## **DEDICATION**

This is dedicated to Mom and Dad.

You have been and continue to be my rock and my heart,  
and I take you with me wherever I go, always.

## TABLE OF CONTENTS

ABSTRACT .....	iii
ACKNOWLEDGEMENTS .....	v
DEDICATION .....	vii
LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
CHAPTER 1: Introduction.....	1
Archaeological Background.....	2
Site Samples Used in These Studies .....	9
Research Objectives: Overview.....	11
Research Objectives: What was the relationship between sex and gender in Mierzanowice Culture communities? .....	12
Research Objectives: Did non-binary gender categories exist in Mierzanowice Culture communities? What did each gender category mean in both an “idealized” sense and in practice?.....	16
CHAPTER 2: Queering Prehistory on the Frontier: A Bioarchaeological Investigation of Gender in Mierzanowice Communities of the Early Bronze Age .....	19
Introduction: Definition and Characteristics of “Frontiers” .....	19
The Mierzanowice Culture of the Central European Early Bronze Age .....	20
Sex and Gender in Mierzanowice Culture Groups .....	24
Theorizing Sex and Gender .....	26
A Case Study .....	29
Methods.....	30
Results .....	33
Discussion .....	39
Conclusion.....	44
CHAPTER 3: Further Analysis of Musculoskeletal Stress and Dental Pathologies .....	46
Osteoarthritis and Schmorl’s Nodes .....	46
Dental Pathologies.....	50
Other Analyses .....	53
CHAPTER 4: The Dead Don’t Bury Themselves: Reflections on Atypical Burial Arrangements and Gender in Mierzanowice Culture Cemeteries .....	56
Abstract.....	56
Introduction .....	56
Theoretical Considerations Regarding Sex and Gender.....	58
Bioarchaeological Approaches to Gender .....	60
Background of Region and Sites in Current Analysis .....	62

Methods.....	66
Summaries of Atypical Burials .....	68
Males or Probable Males in E/W - L Orientations.....	72
(Possible) Female with Masculine Grave Offering.....	74
Single, Adult Burials Facing North.....	76
Single, Subadult Burials Facing North.....	80
Double Burials, One Individual Facing North .....	82
Discussion.....	85
Conclusion.....	88
 CHAPTER 5: Theorizing Gender and Power .....	 90
Research Objective #3: What was the relationship between gender and power in Mierzanowice Culture communities? .....	 90
 CHAPTER 6: Gendered Patterns of Violence and Trauma in Mierzanowice Communities of the Early Bronze Age .....	 93
Abstract .....	93
Introduction.....	94
Archaeological Background.....	95
Materials and Methods .....	97
Results.....	100
Discussion.....	107
Conclusion.....	115
 CHAPTER 7: Conclusion.....	 118
Research Objective #1: What was the relationship between sex and gender in Mierzanowice Culture communities?.....	 118
Research Objective #2: Did non-binary gender categories exist in Mierzanowice Culture communities? What did each gender category mean in both an “idealized” sense and in practice?.....	 120
Research Objective #3: What was the relationship between gender and power in Mierzanowice Culture communities? .....	 122
Future Directions .....	125
 REFERENCES.....	 127
 CURRICULUM VITAE.....	 140

**LIST OF TABLES**

Table 1: Frequencies of osteoarthritis of major joint systems  
by sex and burial orientation..... 35

Table 2: Frequencies of dental pathologies by sex and burial orientation. .... 36

Table 3: Frequencies by sex and burial orientation of antemortem and  
perimortem trauma, as well as of individuals affected by either antemortem  
or perimortem trauma. .... 37

Table 4: Rates of osteoarthritis of the hip joint in male and female samples..... 48

Table 5: Rates of osteoarthritis of the shoulder joint in male and female samples. .... 48

Table 6: Rates of osteoarthritis of the elbow joint in male and female samples..... 49

Table 7: Rates of osteoarthritis of the knee joint in male and female samples..... 49

Table 8: Summarizing information for atypical burials. .... 69

Table 9: Relevant context for each individual with at least one healed  
cranial depression fracture, including the location and side of the  
injury/injuries on the cranium and other archaeological information..... 111

## LIST OF FIGURES

Figure 1: Locations of sites in southeastern Poland. ....	10
Figure 2: Burial orientations by estimated sex. ....	34
Figure 3: Hierarchical clustering based on enthesal scores.....	39
Figure 4: Image of burial 6 from Żerniki Górne showing a probable female between 25 and 30 years of age with a variation of a Le Fort type I fracture of the right midface.....	41
Figure 5: Image of burial 6 from Żerniki Górne showing a probable female between 25 and 30 years of age with symphyseal fracture of the mandible. ....	43
Figure 6: Image of burial 6 from Żerniki Górne showing a probable female between 25 and 30 years of age with indications of possible decapitation or artificial widening of the foramen magnum.....	44
Figure 7: Probability of observed difference in rates of LEH between males and females against 10,000 bootstrapped resamples. ....	54
Figure 8: Probability of observed difference in rates of LEH between west-east burials and east-west burials against 10,000 bootstrapped resamples. ....	54
Figure 9: Average enamel per tooth (vertical distance from occlusal surface to cemento-enamel junction in millimeters) by age category for males and females. ....	55
Figure 10: Probability of observed difference in rates of LEH between west-east burials and east-west burials in the Young Adult age category against 10,000 bootstrapped resamples.....	55
Figure 11: Frequencies of grave goods by burial orientation.....	71
Figure 12: Grave 37, Szarbia (Koniusza Commune). ....	77
Figure 13: Grave 21, Szarbia (Koniusza Commune). ....	78
Figure 14: Rates of antemortem trauma per skeletal element by estimated sex.....	101
Figure 15: Spatial distribution of healed cranial depression fractures.....	102
Figure 16: Rates of perimortem trauma per skeletal element by estimated sex. ....	103
Figure 17: Overall rates of antemortem trauma by age group for males and females.....	104

Figure 18: Overall rates of perimortem trauma by age group for males and females. ....	105
Figure 19: Overall rates of healed cranial depression fractures by age group for males and females. ....	106
Figure 20: Overall rates of perimortem cranial fractures by age group for males and females. ....	107
Figure 21: Cranial fractures and healed parry fracture of the left ulna on a young adult female from Szarbia Zwierzyniecka (grave 11/I).....	116

## CHAPTER 1: Introduction

This dissertation is based on the following three publications:

Toussaint, Mark P. 2019a. "Queering Prehistory on the Frontier: A Bioarchaeological Investigation of Gender in Mierzanowice Culture Communities of the Early Bronze Age." In *Bioarchaeology of Frontiers and Borderlands*, edited by C. I. Tica and D. L. Martin, 55-79. Gainesville, FL: University of Florida Press.

Toussaint, Mark. 2019b. "The Dead Don't Bury Themselves: Reflections on Atypical Burial Arrangements and Gender in Mierzanowice Culture Cemeteries." *Sprawozdania Archeologiczne* 71:65-88.

Toussaint, Mark P. N.d. "Gendered Patterns of Violence and Trauma in Mierzanowice Communities of the Early Bronze Age." Submitted to *International Journal of Osteoarchaeology* (April 2<sup>nd</sup>, 2020)

The following introduction provides framing and background for the dissertation research.

Since the social sciences and humanities started engaging with the concept of gender in earnest in the 1970s and 1980s, the theoretical complexity with which it has been approached and the number of fields incorporating studies of it have grown appreciably. Gender was increasingly the focus of archaeological and bioarchaeological

investigations in the 1980s and 1990s, but early research questions primarily focused on bringing the roles and experiences of women to light and correcting the imbalance of previous decades in which masculinist approaches dominated; not until the late 1990s and early 2000s did archaeologists and bioarchaeologists really begin to engage with gender in a more nuanced way—for example going beyond assumed and inflexible sex/gender binaries (Diaz-Andreu et al., 2005; Geller, 2008; Johnson, 2011; Joyce, 2008). Furthermore, the study of gender in prehistory must contend with a lack of documentary, historical, and direct ethnographic evidence. Nonetheless, as Rosemary Joyce (2008:20) points out, theoretically informed archaeologists and bioarchaeologists are well equipped to tackle questions of gender in prehistory, as our fundamental data is material in origin, and, after all, “Much of the way we learn how to be men and women in any society comes, not through explicit discussion, but through the inexplicit experience of living in a world of things.” Accordingly, this study seeks to add to the inchoate, yet growing body of work on gender in prehistory—not as a pale reflection of a contemporary Western model, but as a nuanced, complex system in its own right.

### *Archaeological Background*

The Mierzanowice Culture (MC) of the Central European Early Bronze Age offers a particularly rich archaeological and mortuary context with which to compare bioarchaeological data when it comes to the study of gender in this time and place. The MC archaeological complex spanned approximately 700 years, between about 2300 and 1600 BCE, and at its largest extent, MC sites could be found along the North Carpathian arc from



Moravia (western Czech Republic), through western Slovakia and much of southeastern Poland, to western Ukraine (Kadrow & Machnik, 1997; Włodarczak, 2017b, 2017c). Burial configuration followed a distinctly gendered component, which inherited a “bipolar” orientation of male and female bodies toward opposite points of the compass from the preceding Corded Ware (CW) and Bell Beaker (BB) complexes of the Final Neolithic. Specific elements of the MC burial tradition differed from those of the aforementioned archaeological cultures, but nonetheless, the idea of differentiating males and females in complimentary, mirror-image burial positions persisted for approximately 1,200 years (Kadrow, 1994b; Kadrow et al., 1992; Kadrow & Machnik, 1997). An advantage to studying the bioarchaeology of gender in the context of the MC, as compared to the Corded Ware or Bell Beaker Cultures, is that several large MC cemeteries have been excavated, while Corded Ware and Bell Beaker burials in this region are known mostly from single graves or small aggregations of graves. Furthermore, a larger number of CW and BB burials seem to have been occupied by males, whereas there is a more balanced ratio of males to females in MC cemeteries, at least in the later phases of the culture (Kadrow, 1994b; Włodarczak, 2017c).

The transition from the Final Neolithic (or Eneolithic) to the Early Bronze Age in Central Europe saw the gradual disappearance of the Corded Ware and Bell Beaker cultural complexes—which shared certain nearly pan-European features, such as gendered burial orientations, ceremonial drinking vessels, and an emphasis on weapons in male graves—and an increasing regionalization of cultural traditions. The CW complex seems to have spread across the North European Plain and into the Carpathian Basin from the east (perhaps under the influence of steppe cultures, such as the Yamnaya), while BB styles

spread generally in a west-to-east progression (Milisauskas & Kruk, 2011). In both cases, this seemed to involve movements of both people and ideas, and the process was not homogeneous. The spread of the Corded Ware complex has been shown to be associated with a relatively large increase in “steppe ancestry” in northern and central Europe, but this was also a process of cultural amalgamation, synthesis, and syncretism. Genetic data show a mixing of steppe ancestry with indigenous ancestry, and archaeological data show regionalization of mortuary practices and material culture, notwithstanding certain universal features (Allentoft et al., 2015; Haak et al., 2015; Juras et al., 2020; Włodarczak, 2017a). Evidence is more mixed for the spread of the Bell Beaker complex via large-scale movements of people in continental Europe; however, migration does seem to play a major role in bringing it to Britain and Ireland (Olalde et al., 2018; Włodarczak, 2017a).

The region in which the MC developed was in the territory where late groups of the BB and CW traditions overlapped, and influences from both complexes can be seen in early MC phases. On a meso-regional level, the MC was part of an apparent interaction sphere centered on the North Carpathian arc, known as the Circum-Carpathian Epi-Corded Culture Circle, which also included the Nitra group of Moravia and western Slovakia, the Košť’any group of eastern Slovakia, and the Strzyżów Culture of eastern Poland and western Ukraine (Kadrow & Machnik, 1997). On a macro level, these groups shared some features of the gendered burial tradition (albeit with different orientations) with cultures of the so-called Danubian Early Bronze Age from parts of Switzerland to western Hungary (Bertemes & Heyd, 2015; Vandkilde, 2007). However, the neighboring Únětice Culture, ranging from central Germany to southwestern Poland and south to parts of Austria and the Czech Republic, eschewed gender differentiation in burial orientation. A central question

motivating this study, therefore, is: given the apparent and enduring importance of differentiating males and females (and possibly other gender categories) in burial orientations and characteristics in this region, what did such distinctions translate to in the lived experience of individuals? In other words, how central was gender in shaping identities and influencing opportunities and outcomes—were apparent distinctions simply ideological in nature, or did they have material consequences?

The duration of the Mierzanowice Culture is typically divided into four phases: the Proto-Mierzanowice Phase (~2400/2300-2200 BCE), the Early Phase (2200-2050 BCE), the Classic Phase (2050-1950/1900 BCE), and the Late Phase (~1900/1800-1600 BCE) (Kadrow & Machnik, 1997; Włodarczak, 2017c, 2017b). Elements used to distinguish these phases include settlement patterns and density, economic models, pottery characteristics, and spatial, organizational, and material aspects of burials and cemeteries. The Proto-MC Phase is characterized by finds of single graves, small groups of graves, seasonal encampments, and small settlements in areas of loess plateaus (Kadrow & Machnik, 1997; Włodarczak, 2017c). The development of larger, longer-lasting settlements seems to have started in the Early Phase. Based on the chronology and spatial clustering of settlements, it seems they were often connected in micro-regional networks. However, the beginning of large cemeteries, located next to, but not overlapping with settlements is known from the Classic Phase (Kadrow, 1994a, 1994b; Kadrow et al., 1992; Kadrow & Machnik, 1997; Włodarczak, 2017c). Generally, from the Proto- through the Classic MC Phases, the number of permanent or semi-permanent settlements increased, larger sites expanded, and the economic model moved from a more mobile one to one that relied on a mixture of settled agriculture and animal husbandry, which emphasized stocks of cattle, sheep/goats, and less

numerously, pigs (Kadrow, 1994a; Włodarczak, 2017c). Based on surface finds and seasonal settlements and encampments, grazing of livestock may have taken place on an area reaching up to 30 square kilometers surrounding permanent settlements (Kadrow, 1994b). The Late Phase was characterized by increasing regionalization of ceramic ornamentation and burial features (though the gendered component remained stable), and a diversification of settlement locations and economic models; some of this may have been due to the influence of neighboring cultural complexes, such as the Únětice and Otomani Cultures (Kadrow, 1994a; Włodarczak, 2017b). Other novelties of the Late Phase include increasing social stratification as seen in distributions of grave goods, and the first appearance of a number of fortified sites in the MC (Włodarczak, 2017b). Interestingly, while vertical distinctions in status were increasingly displayed in grave assemblages, disparities generally decreased between males and females with regard to the richness of grave furnishings and the proportion of burials within the cemetery (Baczyńska, 1994; Kadrow et al., 1992; Włodarczak, 2017c, 2017b).

The larger settlements that have been excavated seem to have been occupied continuously (except perhaps for a hiatus between the Classic and Late Phases) over generations or sometimes centuries. Very few remnants of house structures have been found—most likely because the construction method did not leave traces, as can be the case with log-cabin-type houses that are known from other regions of Central Europe at this time (Włodarczak, 2017b). However, the locations of houses are sometimes inferred from trapezoidal storage pits, which in the earlier phases of such sites appear to have been connected with single households (Kadrow & Machnik, 1997). House structures (both from the spatial arrangement of pits and from the few remains of structures found) were small—

probably big enough for a unit equivalent to a nuclear family (Włodarczak, 2017b). They were mostly scattered or arranged somewhat irregularly; however at the well-investigated site of Iwanowice Babia Góra II, the early building phases showed a more regular, eye-shaped arrangement of structures with one in the center (Kadrow, 1991; Włodarczak, 2017b). It has been estimated that at their most densely occupied, even these large sites were probably inhabited by no more than about 50-100 individuals at any one time (ibid.).

Cemeteries at larger sites often functioned from the Classic Phase through the Late Phase, and some have been estimated to include hundreds of burials (Baczyńska, 1994; Włodarczak, 2017b). Whereas older Corded Ware graves tended to be within mounded, circular kurgans or barrows, Mierzanowice graves are typically flat (Włodarczak 2017a; Włodarczak 2017c). They most often include single burials, although double burials, and more rarely burials of more than two individuals are known. There are two primary orientations of the bodies of the deceased: males are usually laid with their heads to the west and their feet to the east, and females typically are arranged with their heads to the east and their feet to the west. The vast majority of individuals have their faces directed toward the south. Individuals are in a flexed position, either lying on their sides (males on their right, females on their left) or on their backs with their arms and legs turned to the side; again, males – right, females – left (Kadrow & Machnik, 1997; Włodarczak, 2017b). There are, however, important cases that break from these patterns, in which males are buried in the typical female manner (or vice versa, though apparently less commonly), and in which individuals are buried along an east-west axis, but with their faces directed to the north. In general, it seems that subadults are buried much as adults are, though the degree of concordance between the estimated sex of the individuals and their burial

orientations cannot be assessed without ancient DNA analyses. With regard to the spatial layout of cemeteries, the graves are generally arranged in rows and almost never overlap or intersect, indicating that they were likely marked in some fashion (Baczyńska, 1994; Kadrow et al., 1992; Kowalewska-Marszałek & Duday, 2014; Włodarczak, 2017b).

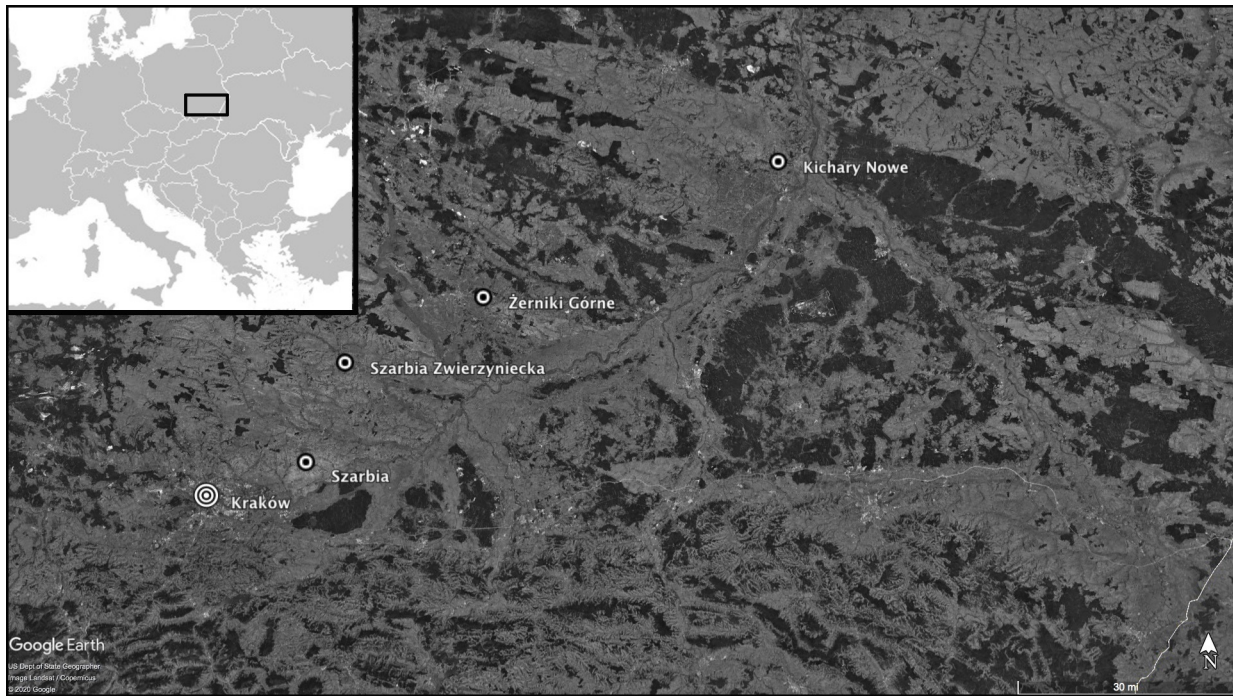
Furthermore, in most cemeteries, no other spatial organization other than a chronological one (filling the cemetery from one end to the other over time) has been found, though in one instance, areas of male, female, and subadult burials were apparent, in addition to “wealthier” and “poorer” areas (Baczyńska, 2000b).

Based on the available archaeological materials, it is difficult to speculate on the exact social structure of MC communities. However, the lack of specialized burial structures for particular individuals (as can be seen, for example, in the “princely burials” at some Únětice Culture sites), and the lack of sites that are clear centers of power would tend to indicate that MC societies were not highly centralized. Nevertheless, the increasing degree of stratification in terms of wealth of grave goods in the Late Phase, as well as the apparent organization of specialized production (e.g., flint, salt, shell beads, faience) and complimentary economic models in different ecological zones of a given territory have led to some preliminary assessments of MC communities as potential Big-Man-type societies (i.e., “charismatic leadership” - Kadrow 2017:182; “personal charisma” - Kadrow, Machnikowa, and Machnik 1995:211) or even incipient chiefdoms (Włodarczak, 2017b, p.81).

### *Site Samples Used in These Studies*

Excavated portions of cemeteries from four MC sites (**Figure 1**) were analyzed for this research: Szarbia (Koniusza commune, Lesser Poland province), Szarbia Zwierzyniecka (Skalbmierz commune, Świętokrzyskie province), Żerniki Górne (Busko-Zdrój commune, Świętokrzyskie province), and Kichary Nowe (Dwikozy commune, Świętokrzyskie province). Both Szarbia and Szarbia Zwierzyniecka were excavated by Barbara Baczyńska in 2000 and from 1980-1985, respectively. Szarbia yielded 45 individuals, and Szarbia Zwierzyniecka—93 individuals from 82 burials; at both cemeteries, the majority of burials are associated with the Late Phase, while a small minority are from the Classic Phase (Baczyńska, 1994, 2000b). Only portions of the cemeteries were excavated (those that were in greatest danger due to erosion and plowing), and at Szarbia Zwierzyniecka, it was estimated that the total count of burials on the whole extent of the cemetery might number as high as 540 (Baczyńska 1994). While the author of this dissertation was the first to conduct anthropological analyses on the burials from Szarbia, those from Szarbia Zwierzyniecka were previously analyzed by Elżbieta Haduch (Haduch, 1997), though such analyses—aside from age and sex estimation—tended to focus more heavily on cranial metrics than on pathologies and trauma. Żerniki Górne was excavated by Andrzej Kempisty (1978) between 1965 and 1968, yielding 39 individuals from the MC (dated from the Early Phase to, possibly, the Late Phase; Włodarczak, pers. comm.), along with individuals from the preceding Corded Ware and Bell Beaker Cultures, and the Middle Bronze Age Trzciniec Culture. Finally, excavations at Kichary Nowe (in a village now known as Nowe Kichary) have been ongoing since 1987, led by Hanna Kowalewska-Marszałek. Kichary Nowe

includes over 40 MC burials, in addition to burials from cultural complexes of preceding eras. The MC burials uncovered date to the Classic and Late Phases (Kowalewska-Marszałek & Duday, 2014).



**Figure 1:** Locations of sites in southeastern Poland. Image by Mark Toussaint and Anna Chmielowska.

Access to the materials for this dissertation was provided by the Institute of Archaeology and Ethnology of the Polish Academy of Sciences with particular facilitation by Dr. Piotr Włodarczak and Dr. Hanna Kowalewsza-Marszałek. For this study, all individuals were analyzed by the author, including those that had been previously investigated by other anthropologists—in part to ensure consistency (all investigated by a single observer), but also to apply currently accepted best practices. In all, a total of 178



individuals were analyzed, which included 130 adults, 43 subadults, and 5 extremely fragmentary individuals for whom no age category could be confidently estimated. Of the adults, 26 were estimated to be female or probable female, 5 were indeterminate, 38 were male or probable male, and 61 did not include elements diagnostic of sex.

### *Research Objectives: Overview*

The three articles that follow in this dissertation each contribute to the investigation of the research objectives in different ways. Each article addresses aspects of multiple objectives, while typically focusing more on a particular question. The main research objectives addressed in this dissertation are:

1. What was the relationship between sex and gender in Mierzanowice Culture communities?
2. Did non-binary gender categories exist in Mierzanowice Culture communities? What did each gender category mean in both an “idealized” sense and in practice?
3. What was the relationship between gender and power in Mierzanowice Culture communities?

Because the goal of the first article in this dissertation (Toussaint 2019a), was to explore a preliminary set of data, identify initial patterns, and provide direction for further research, it touches to varying degrees on each of the three research objectives. The second article (Toussaint 2019b), however, delves more deeply into aspects of research objectives 1 and

2, in particular. These two objectives, intertwined as they are, and addressed in large part by the first two articles, are further unpacked below. The third and final research objective is addressed most directly by the last article in this dissertation (Toussaint n.d.), and will be further discussed in chapter 5 as a prelude to the final article.

*Research Objectives: What was the relationship between sex and gender in Mierzanowice Culture communities?*

It is first necessary to clarify what is meant by “sex” and “gender.” Although researchers in the social sciences and humanities were really the first to make the modern distinction between the two, and much of the work on gender has come out of these fields, there is still a tendency by some to oversimplify the distinctions, and the usage of these terms in common parlance has all but obliterated any such distinctions in non-academic circles. In 1955, the psychologist and sexologist, John Money, used the phrase “gender roles” to refer to the psychosexual identity of an individual—much as today, we would say “gender identity”—which he saw as one of the components of sex, alongside the more tangible and easily quantifiable biological aspects as well as social and developmental factors (Haig, 2004; Money, 1955, 1993). From that time, the term “gender” increasingly came to be associated with social and psychological characteristics, actions, and assumptions that were related to, but distinct from biological sex. Much of the development of the term into its contemporary meaning within the social sciences can be attributed to feminist scholars, whose work on gender resulted in an expansive literature already by the

1980s. By the end of that decade, archaeologists and bioarchaeologists had begun to contribute more substantially to the study of gender in their fields; however, the most common formulation of gender in archaeological and bioarchaeological work of the time tended to reify a relatively simple binary opposition: gender is cultural and sex is biological (Armelagos, 1998; Johnson, 2011).

As it turns out, the relationship between sex and gender is much more complicated than archaeologists and bioarchaeologists first realized. Many still do treat it in their analyses as a binary system of complimentary biological/social components. However, there are several problems with this, borne out by empirical observation and research. Firstly, biological sex is determined by a number of factors, including chromosomes, specific alleles or mutations, and hormone levels *in utero* and post-partum, and the complex interplay and timing of such biological mechanisms can result in a number of different outcomes (Harper, 2007). Intersex individuals, whose sex characteristics fall outside of the normative binary, include so-called male and female pseudohermaphrodites (which have male or female gonads, but feminized or masculinized external genitalia, respectively) and true hermaphrodites (which have both testicular and ovarian tissue) (ibid.). It is to be expected that intersex individuals existed in prehistory, particularly those whose variations were the result of Mendelian traits, such as congenital adrenal hyperplasia (CAH) (Hughes, 2010), androgen insensitivity syndrome (AIS) (Hughes & Deeb, 2006), and 5-alpha reductase deficiency (5-ARD) (Imperato-McGinley et al., 1979). Alleles causing such conditions could plausibly rise to relatively high frequency in small populations—such as those of many prehistoric societies—due to the relative strength of genetic drift versus selection in such circumstances (Kimura, 1983). Indeed, relatively high

frequency of 5-ARD is known in both the Dominican Republic and in certain societies in Papua New Guinea (Herdt, 1994), and individuals affected by this condition are classed to a greater or lesser degree as a kind of third sex—*guevedoche* (“penis at twelve”) (Herdt 1994:426) and *kwolu-aatmwol* (420), respectively.

Another issue with the assumption of a two-sex, two-gender system is the existence both in modern times and in history—and almost certainly in prehistory as well—of gender variants (such as transgender individuals in contemporary Western society and third- or non-binary genders ethnographically). It is estimated that in the United States, 0.6% of the population (~1.6 million individuals) identify as transgender (Flores et al., 2016). This figure is a significant increase from a previous study by the same group, which the researchers attribute to the greater visibility and acceptance of transgender individuals in American society, and therefore a greater willingness to voluntarily identify as such on official surveys (ibid.). This implies that perhaps in societies that recognize gender variants rather than classifying all individuals in a two-sex, two-gender system, one might expect the proportion of gender variants to be higher.

Historical and ethnographic accounts of gender variants—such as Albanian *burneshas* (Roscoe, 1996), the Native American *berdache*, *nádleeh*, *alyha*, and *hwame* (Nanda, 2014; Roscoe, 1996), Indian *hijras* (Nanda 2014), and Scythian *enarees* (“effeminate” men “afflicted...with a feminizing disease”; Herodotus 2014, I:105, IV:67)—highlight the complicated relationship between sex and gender. Stig Sørensen (2000) asserts that archaeologists can no longer operate under an early feminist theoretical framework, which makes only a biological/cultural distinction between sex and gender, particularly given that they are both socially constructed and closely aligned. Judith Butler

(2006[1990]:10) notes that “gender is not to culture as sex is to nature; gender is also the discursive/cultural means by which ‘sexed nature’ or ‘a natural sex’ is produced and established as ‘prediscursive,’ prior to culture, a politically neutral surface *on which* culture acts.” The mechanism that produces such orthodox constructions of sex and gender is theorized in Gayle Rubin’s “sex/gender system” (1975). The sex/gender system, according to Rubin, is “a set of arrangements by which the biological raw material of human sex and procreation is shaped by human, social intervention and satisfied in a conventional manner, no matter how bizarre some of the conventions may be” (165).

For the purposes of this research, both sex and gender must be operationalized in ways that take into account the limitations of bioarchaeological and archaeological methods in a prehistoric context. Therefore, “sex” in this work will refer by necessity to categories defined by anthropological sex estimation. This is typically done on a 1-5 scale, where: 1 = female, 2 = probable female, 3 = indeterminate, 4 = probable male, 5 = male, and is based on the visual assessment of dimorphic features of the pelvis and skull (Buikstra & Ubelaker, 1994). In the articles that follow, females and probable females are usually treated together as “females,” males and probable males as “males,” and individuals assigned a score of 3 are classed as “indeterminate.” Although this may not reflect the full complexity of how an individual presented physically or how they were classified culturally, it is the best we can do in assessing their biological sexual characteristics without additional ancient DNA studies.

Because gender is a social construct, and gender categories are conventions created and maintained by society as a whole (as opposed to gender *identity*), gender can be ascertained archaeologically by the symbolism inherent in how the living chose to bury the

dead and the material goods with which they were buried. It can be further elucidated bioarchaeologically by investigating indicators of habitual activity, nutritional and health status, and trauma—and more specifically, by identifying patterns in the distribution of these indicators among sub-populations.

The first research question—*What was the relationship between sex and gender in Mierzanowice Culture communities?*—can therefore be approached through a series of more concretely operationalized questions:

- How frequently did anthropologically estimated sex categories coincide with burial orientations and with particular assemblages of grave goods?
- How often are there “exceptions” to the dominant patterns, as indicated above, and were exceptions equally frequent for each estimated sex category?
- Which categories of grave goods, if any, were given only to one sex category, and what do such categories signify about idealized divisions of labor or access to power or wealth?

These questions are addressed in the first two articles that follow in this dissertation ([Toussaint 2019a](#); [2019b](#)).

*Research Objectives: Did non-binary gender categories exist in Mierzanowice Culture communities? What did each gender category mean in both an “idealized” sense and in practice?*

This research objective seeks to interrogate whether more than two gender categories were recognized in Early Bronze Age southeastern Poland, and if so, how did

they differ from—or combine aspects of—man/woman gender constructs. Prior to addressing that issue, it is necessary to understand the content of man/woman categories; in other words, what did they mean in terms of idealized (re)presentations of individuals in death, and what did they mean in terms of the practice and performance of gender roles in life?

It is also necessary to have an idea as to what combination of sex estimation and burial characteristics might indicate a non-binary or variant gender category. From ethnographic and historical studies, a central, defining characteristic of gender variants seems to be the type of labor in which they engage. That is to say, rather than being defined simply by immaterial traits of personality or sexuality, the performance of labor typically done by individuals of the opposite biological sex takes center stage in the construction and recognition of gender variant categories. Such was the case with the (biological male) *alyha* of the Mohave (Nanda, 2014), the (biological female) *burneshas* of Albania (Grémaux, 1996), and the female husbands of the Igbo in Nigeria (Nwoko, 2012), for example. Although many of the rights, roles, and privileges associated with the social transition to men or women were conferred on gender variants, rarely were they recognized as having completely transformed; rather, in certain regards they were seen as having a combination of masculine and feminine traits, and so were set apart in a separate category. Furthermore, some gender variants were thought to have spiritual or magical powers, as with the Scythian *enarees* (Herodotus 2014, I:105, IV:67), the Indian *hijras*, and in certain Native American societies (Nanda 2014). The unique nature of gender variants was sometimes reflected in mortuary treatment, as in the case of Tonë, an Albanian *burnesha*, who was buried in male ceremonial attire, but not afforded a traditional male lamentation

ritual (Grémaux 1996), and with We'wha, a Zuni *lhamana* (male gender variant), who was buried in pants (typically masculine) and a dress (typically feminine), and whose grave was in the male section of the cemetery (Roscoe, 1991).

Thus, to address this research objective, it is necessary to first investigate what constituted “masculine” and “feminine” in Mierzanowice communities. This can be approached by noting patterns in burial orientations, distributions of grave goods, labor practices (as indicated by patterns in musculoskeletal stress markers), and rates of nutritional or metabolic stress and trauma. Next, one should take note of burials in which the estimated sex and the orientation of the body do not follow the typical pattern, as well as those in which both masculine and feminine symbolism are present. This research objective is addressed in part by each of the three following articles ([Toussaint 2019a](#); [2019b](#); [n.d.](#)), but in particular by the second ([Toussaint 2019b](#)).



## **CHAPTER 2: Queering Prehistory on the Frontier: A Bioarchaeological Investigation of Gender in Mierzanowice Communities of the Early Bronze Age (Toussaint, 2019a)**

### *Introduction: Definition and Characteristics of "Frontiers"*

"Throughout history...societies have been formed and transformed in relation to their frontiers..." (Rodseth & Parker, 2005, p.3)

Following Rodseth and Parker (2005, p.10), borders and frontiers are both subtypes of boundaries, which serve to delimit and differentiate various entities. Whereas borders are typically more distinct and codified, frontiers are "zones of transition between two core areas, each of which contains a population center and usually a center of political power." It is this transitional and dynamic character which is most applicable to this particular study.

Boundaries need not necessarily be physical, but can be conceptual, as well. Conceptual boundaries can be based on perception, ideology, and worldview (Pellow, 1996). Such cultural boundaries, which correspond to "different worlds of meaning" (Donnan & Wilson, 1999, p.19), are not mutually exclusive with more concrete geopolitical boundaries; in fact, boundaries of meaning may be defended as passionately as more material, territorial boundaries (Casimir, 1992). In some cases, it may be the conceptual and cultural boundaries that arise first, creating de facto territorial boundaries in their wake (Pellow, 1996).

The construct of gender is subject to the forces and possibilities of the social landscape of the frontier. One crucial variable in frontier situations that influences the negotiation of gender is power. In highly stratified and centralized societies, for example, the integrity of the border and the allegiance and conformity of peoples on the frontier is often seen as necessary because borders are the “...first lines of defence, institutions of social coercion, and symbols of a variety of state powers” (Wilson & Donnan, 1998, p.10), and therefore, “...it is often precisely at borders that state power is most keenly marked and felt...” (p.17). On the other hand, the nature of boundary regions and frontiers can be used strategically by individuals to exercise their *power to* (as defined in Pitkin, 1972). As Barth ([1969]1998) points out, social or ethnic boundaries do not necessarily circumscribe populations with static, unchanging membership, but are maintained even in the face of changing personnel. As individuals move across boundaries, they can use the power that they possess “...as an attribute of the person, emphasizing potency or capability” (Wolf, 1990, p.586) to manipulate and contest meaning. Gender, being culturally salient in many situations, is one such attribute that can be so used (Levy, 1999).

### *The Mierzanowice Culture of the Central European Early Bronze Age*

The Mierzanowice Culture (MC) is the name given to an archaeological complex that existed from about 2400/2300 – 1600 BCE, in the Early Bronze Age of Central Europe (Górski et al., 2013; Kadrow & Machnik, 1997). At its largest extent, MC covered parts of Moravia (Czech Republic), eastern Slovakia, southern Poland, and western Ukraine, to the north of the Carpathian mountain range (Kadrow and Machnik, 1997). Mierzanowice

populations appear to have been settled, at least since their Early Phase, and their subsistence practices seem to have been mixed, with an agricultural component as well as a reliance on animal husbandry (Kadrow et al., 1995). Despite the existence of long-term settlements, few archaeological remains of structures have been found. Using data from settlement pits, it is inferred that each one corresponded to a single house structure, which was used by something like a nuclear family unit (i.e., they were not large enough for an extended family; “nuclear family” is not used to imply any particular definition of “family”) (Kadrow, 1991, 1994b). At the site of Iwanowice, Babia Góra II, which is perhaps the most well investigated MC settlement, the house structures originally appeared to be arranged in a lens- or eye-shaped manner with one structure in the middle. In later phases, the arrangement of house structures became more open, taking on a more linear appearance with increasing distance between T-features, and fewer of them (Kadrow, 1991).

Mierzanowice Culture cemeteries were usually associated with main, long-term sites in settlement micro-regions, and were located close to—but separated from—the settlement areas. The cemetery at Babia Góra gives the impression of having been planned, with boundaries delimited at the beginning of its use, in part through the creation of a ditch between the cemetery and the settlement area (Kadrow et al., 1995). Graves were likely marked, since overlapping or intersecting graves are unknown at Babia Góra and at the cemetery of Szarbia (Skalbmierz commune), for example (Baczyńska, 1994; Kadrow et al., 1992, 1995). The only obvious spatial pattern at these two cemeteries is a chronological one, in which the cemetery was filled in from one end to the other in a fairly sequential manner (Baczyńska, 1994; Kadrow et al., 1992).

At Mierzanowice cemeteries in general, the biological sex of individuals, as estimated anthropologically, seems to correspond strongly to several burial characteristics. Although there is some variation, both chronologically and site-to-site, the principal axis of the body in the grave is E-W (Kadrow & Machnik, 1997; Kadrow et al., 1992). Males are typically arranged with their heads to the west, and females with their heads to the east. Both sexes are usually in a crouched position, and their faces are directed to the south. Males are most often lying on their right sides and females on their left. Deviations from the E-W axis have been variously explained as relating to the topography and orientation of the site, the chronological phase of the Mierzanowice Culture, and potentially corresponding to sunrises and sunsets at different times of year (Bąbel, 2013a; Kadrow et al., 1992).

Grave goods can be found in male, female, and children's graves (which appear to follow the same patterns), although for many types of goods, there is more fluidity than might be indicated by the burial orientations. Items which are primarily reserved for male graves include stone "battle axes," arrowheads and stone wrist guards, boar-tusk pendants, discs or badges made of bone or copper, and to some degree with pins and antler artifacts. Predominantly female items include necklaces of animal teeth, copper spiral-shaped earrings, and needles (Baczyńska, 1994; Kadrow, 1994b; Kadrow & Machnik, 1997). Although they are more prevalent in female graves, beads of bone and mussel shell (used in necklaces and other types of jewelry) can be found in the graves of both males and females. Other more universal items (for adults) included faience beads, simple earrings of copper wire, and pottery. The presence and amount of each item is dependent also on the chronological phase.

The Mierzanowice Culture and related groups of the so-called Circum-Carpathian Epi-Corded Culture Circle, bordered populations of the Únětice Culture (in western Germany, northeastern Austria, the Czech Republic, and western Poland) and the Otomani-Füzesabony Culture (in adjacent parts of Slovakia, Hungary, Romania, and Ukraine), both of which seem to have been more centralized than the Mierzanowice Culture, judging by monumental architecture, prestige items, and other archaeological evidence (Harding, 2000; Jiráň et al., 2013; Kadrow, 1994b; Marková & Ilon, 2013; Vandkilde, 2007). In the Únětice Culture (UC), the most archaeologically visible and discussed signs of this stratification are the so-called “princely burial” mounds and hoards of bronze weapons and jewelry. Fourteen such mounds are known to have existed at Łęki Małe in Poland, near the fortified site of Bruszczewo. Janusz Czebreszuk states that the phenomenon at Bruszczewo and Łęki Małe “may be interpreted in terms of proto-state structures possessing a stable governing body, an extensive network of extra-regional contacts, varied artisanal production, and a well-organized food economy” (2013, p.782).

Gender differentiation in flat inhumations of the UC is far less pronounced in both orientation and grave furnishings than in the MC region. Males, females, and sub-adults are usually all buried on their right sides, in a crouched or fetal position on a N-S axis, with their heads to the south, and their faces to the east (Pokutta, 2013; Vandkilde, 2007). Although princely burials are most often associated with males throughout the Únětice region, some burial mounds in Poland include females, as well (Pokutta, 2013; Vandkilde, 2007).

The Otomani-Füzesabony Culture (OFC) in the Carpathian Basin is found primarily in parts of Hungary, Slovakia, Romania, and Ukraine, and there is ample evidence that it

permeated lower-lying mountains and hills of the Carpathian chain into southeastern Poland (Jaeger, 2010; Marková & Ilon, 2013; Przybyła & Skoneczna, 2013). The OFC is most well-known for its prolific and advanced metallurgy, with many of the dead being buried with copper, bronze, and gold (Jaeger, 2014; Jaeger & Olexa, 2014; Marková & Ilon, 2013), including “...85-90% of the 784 discovered burials” at the site of Nižná Myšľa in Slovakia (Jaeger & Olexa 2014, p.172). At some of the fortified sites, deposits of metals have been found underneath dwellings, which Jaeger and Olexa (2014, p.165) posit as a possible indication of private property, and the ability to amass wealth. Like other cultural paradigms in the Carpathian region, OFC groups maintained the tradition of “bipolar,” sex-differentiated burials, with those in closer contact to the Epi-Corded groups using the E-W orientation, and others adopting N-S (Marková & Ilon, 2013).

### *Sex and Gender in Mierzanowice Culture Groups*

Over the 700 or so years the Mierzanowice Culture endured, despite increasing regionalization and influences from surrounding cultural paradigms, the one thing that remained the most constant throughout the region was the tradition of mirror-opposite, sex-differentiated burials (Kadrow, 1994b). Although the precise orientations of the bodies varied throughout time and space, this dichotomous aspect persisted from the time of the Corded Ware and Bell Beaker cultures of the Final Neolithic until the end of the Early Bronze age in the MC region (Kadrow, 1994b; Milisauskas & Kruk, 2011; Włodarczak, 2014). This represents a span of some 1200 years. Although it is impossible to know the exact symbolic and ideological significance of these burial traditions—let alone the degree

to which meaning and symbolism changed from region to region and throughout the generations—it is clear that some kinds of distinctions were made, whether based on socially salient categories of sex or of gender. Such distinctions must have been an important aspect of identity in MC communities.

On the other hand, perhaps the binary nature of the burial characteristics has been overstated. There is no shortage of “exceptions” that are documented in the data. For example, at the site of Babia Góra, one woman appeared to have been on her right side (typically reserved for males), with her head to the east (typical for females), and her face directed to the north (atypical) (Kadrow et al., 1992). An individual estimated to be male was on a N-S axis, with his head to the north and his face to the east, which is singular at this cemetery and rare in this region for MC graves, but not unheard of throughout the Circum-Carpathian region. Also, among nine graves with two or more individuals, were included two young males, both on their backs on an E-W axis with heads to the west, one completely supine and looking south, the other with legs and face turned to the north. Their bodies were touching, and they had the appearance of looking at one another. In addition, they are both recorded as having perimortem cranial injuries (ibid.).

At the site of Szarbia Zwierzyniecka, exceptions were even more common. Of the burials that were well preserved enough to estimate sex and/or burial orientations, 21 were in the orientation typical for males, and two individuals among those were estimated to be female (9.5%), while five were undetermined (23.8%) (Baczyńska, 1994). Among 30 typically female burial orientations, five individuals were estimated to be males (16.7%) and nine were undetermined (30%). Of the 14 multi-individual burials, one contained two males, both in the usual male position; one individual was missing the cranium, with only

the lower limbs in anatomical position—all other bones were piled together where the cranium would be. Another double burial was of a male with a small child on his chest. He was on an E-W axis on his right side (typical for males), but with his head to the east (typical for females) and face directed to the north (atypical) (ibid.).

To be sure, there are a variety of potential explanations for the many non-typical burial arrangements, including the possibility that those treated differently were non-locals. Given how strong the association is between the axis of the body, the side on which the body is lain, and the estimated sex of the individual, however, I believe that most permutations of these characteristics are likely to have held meaning relating to social conceptions of gender. Thus, for the scope of this exploration, I will focus on the bioarchaeology of sex and gender.

### *Theorizing Sex and Gender*

It is all too easy for the general public and for bioarchaeologists alike to interpret the past through our own contemporary cultural lenses if we are not sufficiently reflexive. As a case in point, a burial of a male individual of the Corded Ware Culture found in the Czech Republic some years ago, which deviated from the typical male burial pattern was described in *The Telegraph* (6 April 2011) as the “first homosexual caveman.” How do we make sense of the cultural logic behind the apparent pattern of burying anthropologically sexed males and females in mirror-opposite positions without discounting burials that deviate from this pattern as mere exceptions, or otherwise foisting our own cultural significance onto such differences?



Pamela Geller (2008, 2017) urges bioarchaeologists to resist the “presentism” of framing studies of the past in terms of the modern heteronormative discourse of the male/female, man/woman, productive/reproductive binaries. Thus, a first step for bioarchaeologists—especially bioarchaeologists of prehistory—is to allow for the possibility that the people we study did not see only binaries, but may have acknowledged more than two gender categories, or even a fluidity between the categories. Furthermore, we must resist the urge to uncritically attach our own significance to potential social categories that we encounter. For example, the assumption that a biological male who was buried in a manner typically reserved for females was homosexual ignores the complexity of historical and ethnographic examples in which sexual behavior is not a primary characteristic of gender categories.

A useful concept for understanding and discussing ethnohistoric examples of gender variants is the “sex/gender system.” The sex/gender system, according to Gayle Rubin, is “a set of arrangements by which the biological raw material of human sex and procreation is shaped by human, social intervention and satisfied in a conventional manner, no matter how bizarre some of the conventions may be” (Rubin, 1975, p.165). It has been convincingly argued elsewhere that—biological differences notwithstanding—salient categories of sex are socially constructed, and are therefore culturally and historically contingent (Fausto-Sterling, 2000; Laqueur, 1990). Characterizing the relationship between sex and gender, Judith Butler (2006[1990], p.10) notes that “gender is not to culture as sex is to nature; gender is also the discursive/cultural means by which ‘sexed nature’ or ‘a natural sex’ is produced and established as ‘prediscursive,’ prior to culture, a politically neutral surface *on which* culture acts.” In other words, variations in both human

biology and behavior are real, but the ways in which such variation is classified and the significance attached to these categories are products of each specific time and place. The particular forms that are taken by constructions of sex and gender serve the purpose of making possible and reinforcing political, economic, and other arrangements and systems in a given society.

It is not surprising, therefore, that numerous different sex/gender systems have been documented historically and ethnographically. In the 5<sup>th</sup> century BC, Herodotus (I:105, IV:67) writes of a category of “effeminate” men among the Scythians, called *Enarees*, who are “afflicted...with a feminizing disease,” and at least some of whom were soothsayers. Thomas Laqueur (1990) argues that a one-sex model existed among the ancient Greeks, in which differences between males and females were of degree and not of kind. More recently, but still in the Western cultural sphere, there is the example of the “sworn virgins,” or *burneshas* of Albania and the western Balkans, attested from at least the early 19<sup>th</sup> century (Grémaux, 1996; Nanda, 2014). These are biological females who transition socially to assume traditionally male roles, and who enjoy male privileges in a patriarchal society. Often, they assume male roles because of needs that arise in their family homes, such as a lack of male heirs. They wear masculine clothing and adopt masculine mannerisms and ways of talking. René Grémaux (1996) documents one example at the funeral of a *burnesha*, in which he was buried in traditional masculine ceremonial clothing, but could not be given the customary male funerary lamentation due to the customs of the local tribe. In addition, Serena Nanda (2014) documents many non-Western examples of gender variants, including Navajo *nádleeh*, Mohave *alyha* and *hwame*, and Indian *hijras* and *sādhins*. In many cases, the gender variance of such individuals is not

recognized as a complete transition from man to woman, or vice versa, but rather as a different status altogether. Often, this involved being seen as having qualities of both men and women, or of being biologically one sex while embodying the gender typically associated with another sex. In nearly all of these examples, one of the defining characteristics of a gender variant is the type of labor in which they engage.

Taking all of this into account, I propose that it is still important for bioarchaeologists to continue to estimate and take into account “biological sex” in their research; however, as Pamela Geller urges (2017), they must bear in mind that the ways in which they assess and define sex are also a product of social and historical forces. Therefore, we cannot assume that what we deem as “male”, for example, was seen as such by past societies. However, by keeping our eyes and minds open to the nuances, to the blurry edges of our constructions—by letting go sometimes of the need to force ambiguous features into male or female categories—and by comparing the differences we notice in biology to embodied differentials in labor, nutrition, resources, and interpersonal conflict, we may begin to tease apart aspects of the sex/gender system.

### *A Case Study*

For this preliminary study, a total of 26 adult individuals from the Mierzanowice Culture cemeteries at Żerniki Górne ( $n = 19$ ) and Szarbia (Koniusza commune) ( $n = 7$ ) were assessed for sex and age estimation, health and diet indicators, trauma, and musculoskeletal stress. Due to taphonomic considerations, not all individuals were included in every analysis. Żerniki Górne represents graves from the Classic and Late

Phases of the Mierzanowice Culture (Krenz-Niedbała, 1999), and based on the extensive presence of faience beads and metal jewelry (Kadrow & Machnik, 1997), many graves from Szarbia are also likely from the Late Phase. Both sites are located in the upland regions of southeastern Poland; Żerniki Górne was excavated by Andrzej Kempisty between 1965 and 1968 (Kempisty, 1978), and Szarbia was excavated in the summer of 2000 by Barbara Baczyńska (2000b).

### *Methods*

Multiple methods were applied in the estimation of the sex and age of individuals, and a composite result was used. For age estimation, the methods of Brooks and Suchey (1990), Todd (1920, 1921), Lovejoy and colleagues (1985), Ubelaker (1978), Buikstra and Ubelaker (1994), Scheuer and Black (2000), and Meindl and Lovejoy (1985) were used. Where such methods were of little use due to lack of diagnostic features or taphonomy, dental attrition (Lovejoy, 1985) was used. Where possible, greater weight was given to indicators of the pelvic region for adults with fully fused epiphyses. Estimation of sex was carried out using the heuristics described in Buikstra and Ubelaker (1994), including the characteristics of the ischio-pubic region as described by Phenice (1969). However, given the lack or taphonomic degradation of the ischio-pubic region for many individuals, as well as the subjective nature of categorical assessments of the greater sciatic notch (especially in cases of individuals who do not fall at the extremes), the multi-component method of Jaroslav Bruzek (2002) was also used. Where there was a slight disagreement between methods (e.g., probable male vs. male, or indeterminate vs. male), the more robust methods

were given extra weight. However, in the case of extreme disparity in results or where a high degree of ambiguity existed, the sex was considered “indeterminate.”

Per Joanna Sofaer (2006), the skeleton can be seen as a material record of embodied social arrangements and constructs, which manifest as markers of health, disease, trauma, and musculoskeletal stress, resulting from constraints placed upon—or privileges conferred to—individuals. Here, musculoskeletal stress is used to signify any load or biomechanical demand placed upon the skeletal system. Markers of musculoskeletal stress that were investigated here include osteoarthritis (marginal osteophytes, eburnation, new bone formation, pitting)—which is pathological and related to multiple factors including age and biomechanical stresses (Waldron, 2009)—and enthesal development, which in many cases is non-pathological. In this study, it is enthesal *robusticity* that is recorded, and not enthesal *changes* (EC) in a pathological sense. There has been much debate over the degree to which entheses can be informative about past activity (e.g., Henderson et al., 2013; Villotte et al., 2010). Age has consistently been found to be closely related to enthesal changes (Havelková et al., 2013; Henderson et al., 2013; Mariotti et al., 2007; Villotte et al., 2010), but there have been conflicting results regarding the relationship between activity and entheses; some studies have not found a link (e.g., Cardoso & Henderson, 2010; Milella et al., 2012; Niinimäki & Baiges Sotos, 2013), while others have (e.g., Mariotti et al., 2007; Niinimäki, 2011; Niinimäki et al., 2013; Villotte et al., 2010; Villotte & Knüsel, 2013). Although there is clearly a multi-factorial etiology of enthesal morphology and changes, and there is much research yet to be done before the relationship between entheses and activity can be clarified, I believe that researchers should proceed in

collecting data on entheses in a standardized manner and should interpret their results cautiously.

To that end, enthesal robusticity is scored in this study using the methods of Mariotti et al. (2007), and analyses are conducted not in order to link the development of specific entheses to specific activities, but rather to investigate overall patterns in enthesal development across the sample. The idea behind such an approach is that no individual or group of individuals is doing only one activity or one type of movement over and over. Rather, one would expect that if enthesal development does reflect activity to some degree, then the skeleton is a palimpsest of all of the major types of activity that an individual does in his or her lifetime. Of course, those activities that produced the greatest loads or were carried out most repetitively would likely have the greatest influence. And, hypothetically, if activities were at least to some degree the purview of particular segments of society (i.e., a gendered division of labor, or status differences in activity), we might reasonably expect to see overall patterns show up through the individual noise.

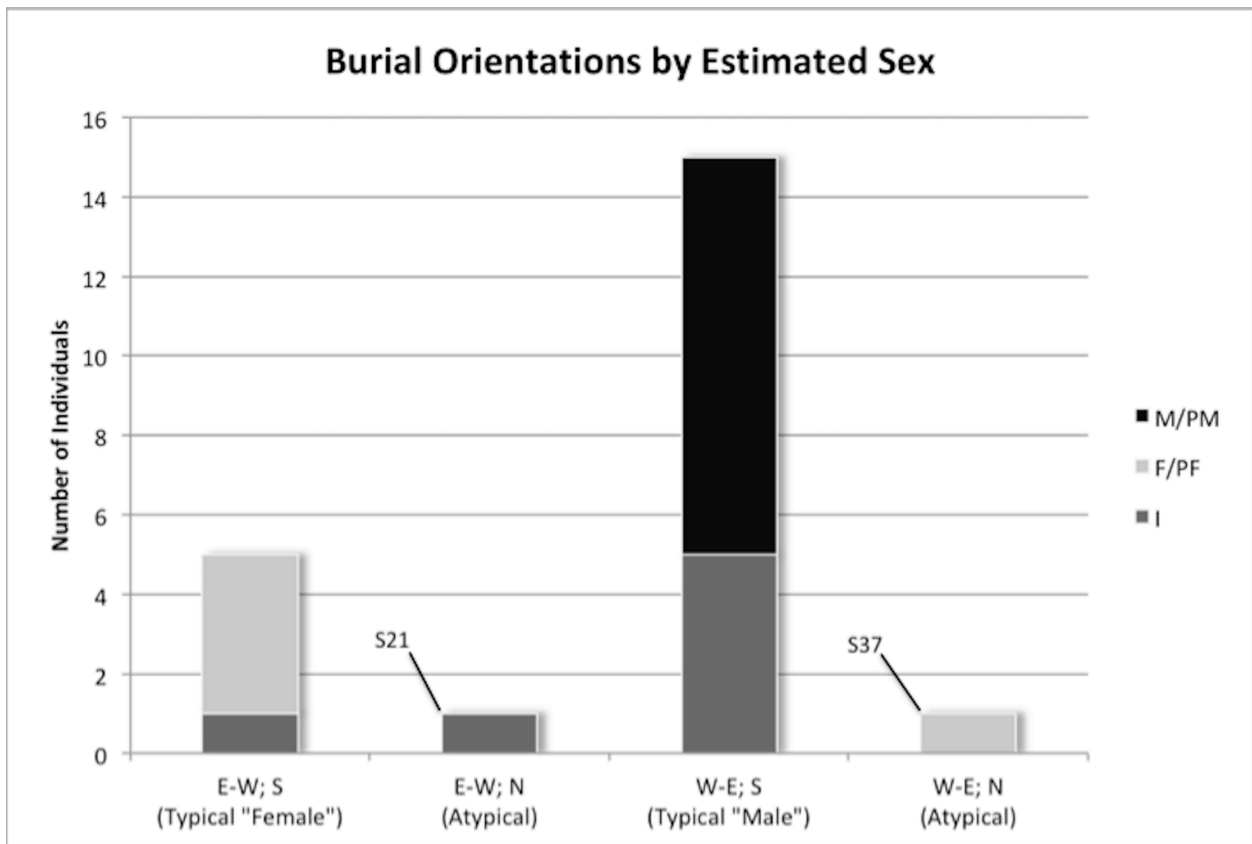
In an attempt to discern any such patterns, a clustering algorithm was used. Data were taken for a total of 28 entheses of the upper and lower body (14 left, 14 right; 20 upper body, 8 lower body). However, because of missing skeletal elements or taphonomy, many individuals were missing data for several entheses. Therefore, a subset of entheses were chosen for this analysis in order to ensure as large a sample size as possible, and to avoid having to impute missing values for this preliminary study. The scores from the left and right *deltoideus*, *pectoralis major*, and *gluteus maximus* were used from a total of 19 individuals. Manhattan distances between individuals were calculated, and hierarchical clustering with complete linkage was performed using the R Statistical Computing Package.

A large literature exists in bioarchaeology regarding differential disease risk (e.g., Bird & Rieker, 2008; Grauer & Stuart-Macadam, 1998; Koziol, 2012; Martin, 1997) and exposure to violent trauma (e.g., Grauer & Stuart-Macadam, 1998; Koziol, 2012; Martin, 1997; Robb, 1997; Tung, 2012; Walker, 1997), based on salient social categories such as sex, gender, age, and occupation. The exact patterns and directionality of differential risk are culturally and historically contingent, but categories of social significance nearly always play a role. Accordingly, this study attempted to document skeletal indicators of nutritional insufficiency (e.g., porotic hyperostosis, cribra orbitalia, rickets, scurvy), dental disease (e.g., caries, antemortem tooth loss, abscesses), infection (e.g., osteomyelitis, periostitis), and general indicators of health, such as adult stature (Ortner, 2003; Ruff et al., 2012; Waldron, 2009). Blunt force and sharp force trauma were also recorded, including cranial depression fractures, radiating fractures, spiral fractures, parry fractures, cutmarks, and percussion marks (Wedel & Galloway, 2014). Due to taphonomic considerations, however, porotic hyperostosis and periosteal reaction were generally not possible to observe. Furthermore, too few individuals had femora or tibiae complete enough to allow for a meaningful reconstruction and consideration of adult stature in this study.

### *Results*

Unsurprisingly, the small sample size for this study likely hindered the ability to find statistically significant differences between sex or burial orientation and variables such as musculoskeletal stress markers, disease indicators, and trauma. Furthermore, the sex of several individuals could not be confidently estimated as male or female by the given

criteria, and were listed as indeterminate. Almost certainly, some fraction of those individuals were indeed viewed in life as either male or female, but one goal of this study was to resist the urge to force individuals into one category or another for analysis, and additionally it is quite possible that some of these individuals may have been seen in life as something other than “male” or “female.”



**Figure 2:** Burial orientations by estimated sex. “M” is male, “PM” is probable male, “F” is female, “PF” is probable female, and “I” is indeterminate or unable to estimate.



Each analysis carried out with regard to the different variables was done with respect to both estimated sex and burial orientation. The hypothesis was that burial orientation might be more informative of how Mierzanowice Culture communities viewed individuals within their sex/gender system. **Figure 2** shows the frequencies of burial orientation by estimated sex. The majority of “indeterminate” individuals were buried in the manner typical for males, but it is worthwhile to note that one of individuals buried in an atypical orientation (facing north) was of indeterminate sex (Szarbia, grave 21), and was found without any grave equipment. The other atypical burial (Szarbia, grave 37) was of a probable female, laid in a typically male orientation, but on her left side, facing north. She was found with equipment that included some materials typically given to males and some typically given to females; in any case, her assemblage of grave goods was rather rich for this cemetery (Baczyńska, 2000a).

<b>Sex</b>	<b>Spine</b>	<b>Knee</b>	<b>Shoulder</b>	<b>Elbow</b>	<b>Hip</b>	<b>Ankle</b>
M/PM	3/6	2/7	3/7	3/7	3/7	2/6
F/PF	1/2	1/3	1/3	1/3	1/3	0/2
I	3/4	0/4	0/4	1/4	0/4	0/3
<b>Orientation</b>	<b>Spine</b>	<b>Knee</b>	<b>Shoulder</b>	<b>Elbow</b>	<b>Hip</b>	<b>Ankle</b>
W-E, S	3/7	2/8	3/8	4/8	3/8	2/7
W-E, N	1/1	0/1	0/1	0/1	0/1	0/1
E-W, S	2/3	1/4	1/4	1/4	1/4	0/3
E-W, N	1/1	0/1	0/1	0/1	0/1	0/0

**Table 1:** Frequencies of osteoarthritis of major joint systems by sex and burial orientation.

Frequencies are given as the number of affected individuals out of the total number for whom the condition could be assessed in each category.

<b>Sex</b>	<b>LEH (# teeth)</b>	<b>Caries (# teeth)</b>	<b>AMTL (# individuals)</b>
M/PM	<i>1/107</i>	6/107	3/5
F/PF	<i>2/50</i>	3/50	1/2
I	<i>3/31</i>	0/31	1/1
<b>Orientation</b>	<b>LEH (# teeth)</b>	<b>Caries (# teeth)</b>	<b>AMTL (# individuals)</b>
W-E, S	<i>4/138</i>	6/138	4/6
W-E, N	0/0	0/0	0/0
E-W, S	<i>2/50</i>	3/50	1/2
E-W, N	0/0	0/0	0/0

**Table 2:** Frequencies of dental pathologies by sex and burial orientation. Frequencies are given as the number of affected individuals out of the total number for whom the condition could be assessed in each category. Numbers in italics indicate a statistically significant difference.

Frequencies of osteoarthritis (OA) were calculated for major joint systems (spine, knee, shoulder, elbow, hip, and ankle) (**Table 1**). None of them reached significance ( $p < 0.05$ ) for either sex or burial orientation. The closest any of the variables came to statistical significance was osteoarthritis of the shoulder and of the hip by sex ( $p = 0.3566$  for both; Fisher's Exact Test; two-tailed). The small sample size does not allow for a high degree of confidence in any apparent patterns.

In order to analyze the rates of linear enamel hypoplasia (LEH) and dental caries, frequencies were calculated per tooth. These were not calculated on an individual level, because their observation depends on the number of teeth present. The rates of antemortem tooth loss (AMTL), however, were calculated per individual, since diagnostic criteria do not depend on the presence/absence of teeth, but rather on signs of remodeling

in the dental alveoli. Frequencies are given in **Table 2**. The only test that reached significance was for LEH by sex ( $p = 0.02661$ ; Fisher’s Exact Test; two-tailed). Pairwise comparison showed a difference between the rates of LEH in male/probable male and indeterminate individuals, which was significant below the 0.05 level. However, this result is not significant after applying the Bonferroni correction, which in this case requires a critical value of 0.017. It is interesting to note that the single “indeterminate” individual from which the three teeth with LEH came was buried in a typical “male” fashion.

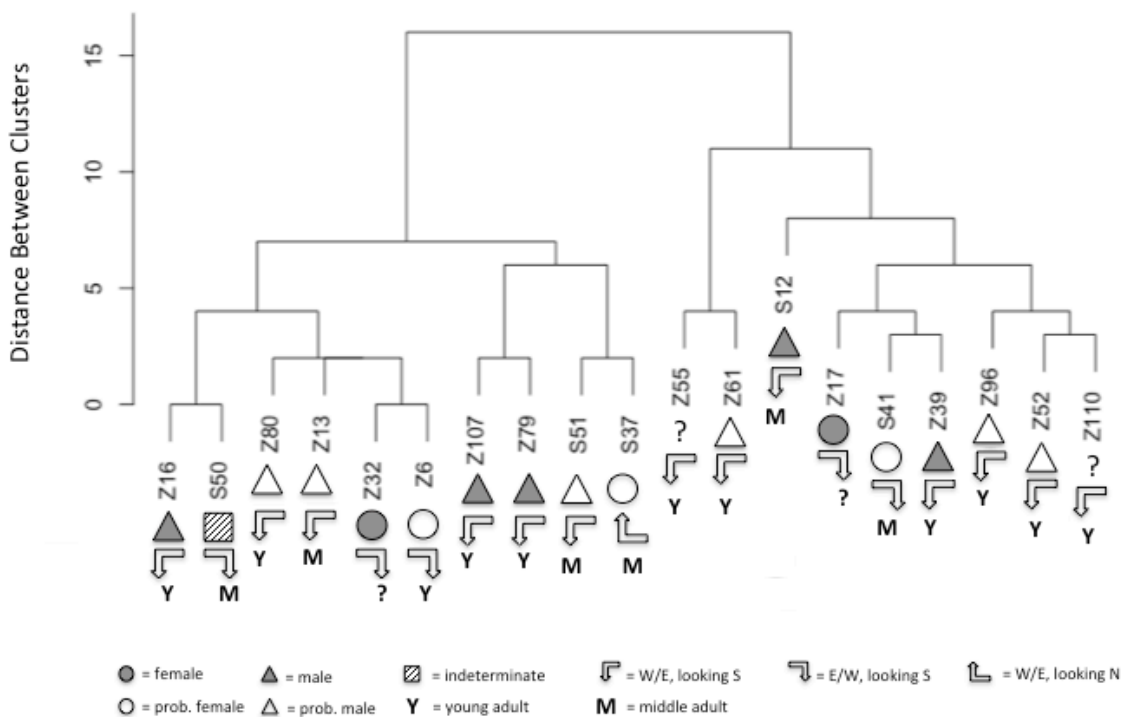
<b>Sex</b>	<b>Antemortem</b>	<b>Perimortem</b>	<b>Either</b>
M/PM	<i>2/7</i>	<i>2/7</i>	<i>4/7</i>
F/PF	<i>3/3</i>	<i>1/3</i>	<i>3/3</i>
I	<i>1/4</i>	<i>1/4</i>	<i>2/4</i>
<b>Orientation</b>	<b>Antemortem</b>	<b>Perimortem</b>	<b>Either</b>
W-E, S	<i>2/8</i>	<i>3/8</i>	<i>5/8</i>
W-E, N	<i>0/1</i>	<i>0/1</i>	<i>0/1</i>
E-W, S	<i>4/4</i>	<i>1/4</i>	<i>4/4</i>
E-W, N	<i>0/1</i>	<i>0/1</i>	<i>0/1</i>

**Table 3:** Frequencies by sex and burial orientation of antemortem and perimortem trauma, as well as of individuals affected by either antemortem or perimortem trauma. Frequencies are given as the number of affected individuals out of the total number for whom the condition could be assessed in each category. Numbers in italics indicate a statistically significant difference.

Data on trauma was collected, and frequencies of antemortem, perimortem, and either kind were calculated per individual (**Table 3**). The only relationship that reached significance was that between burial orientation and antemortem trauma ( $p = 0.02431$ ; Fisher's Exact Test; two-tailed). Among pairwise comparisons, the difference between rates of antemortem trauma in the W-E/S and E-W/S reached a significance of  $p = 0.0606$  (two-tailed). Again, after controlling for the family-wise error rate, this did not reach significance.

Hierarchical clustering of individuals (based on Manhattan distances calculated from enthesal scoring) resulted in two main clusters. **Figure 3** shows the resulting clusters, along with the estimated sex, the burial orientation, and the estimated age of the individuals (in broad age categories: Young Adult, Middle Adult, etc., per Buikstra & Ubelaker, 1994). Multiple logistic regression was performed with the cluster as the response variable and sex, burial orientation, and age as the independent variables. There was no statistically significant relationship between any of the independent variables and the cluster. Age came the closest to significance ( $p = 0.119$  when the model used only "age" as an independent variable), with younger individuals being more strongly associated with the right-branch cluster.

### Hierarchical Clustering Based on Enthesal Scores



**Figure 3:** Hierarchical clustering based on enthesal scores. The symbols below the individuals represent the estimated sex, the burial orientations, and the age groups of the individuals.

### Discussion

Mierzanowice Culture cemeteries provide a unique opportunity to investigate and theorize the relationship between sex and gender in prehistory, due to their “bipolar” burial orientations, which seem to give a window into social constructions of identity,

including perhaps sex, gender, and status. Resisting the urge to foist modernist notions of sex onto past societies, and leaving space for ambiguity in the estimation of biological sex of skeletal remains opens up the possibility of seeing intersections of identity that may otherwise be invisible. The flipside to this approach is that there is almost certainly not a one-to-one correspondence between remains that are difficult to sex anthropologically and individuals who may have been seen as other than simply male or female in life. Some of the individuals who are put into the “indeterminate” category were quite likely male or female—particularly in societies such as those of the Mierzanowice Culture, where there is evidence of a pseudo-binary categorization.

Aside from the ambiguities involved in estimating the sex of skeletal remains in general, missing skeletal elements and taphonomic considerations greatly increased the number of individuals of indeterminate sex in this sample, as well as the amount of missing data. This compromised the ability to find statistically significant relationships in an already small data set. Nonetheless, there are some patterns that were beginning to emerge in this study, and which may become clearer when more data are collected.

First of all, this study confirms the close relationship between burial orientations and sex. All of the male individuals in this study were buried on a west-east axis, with their heads to the west, and faces directed southward. All of the females except one were buried on an east-west axis, with their heads to the east, and faces also directed southward. It is interesting to note that, aside from this one female buried in an atypical fashion, there is also an individual of indeterminate sex (Szarbia, grave 50) who is buried in the typical “female” fashion, but whose grave goods included a flint arrowhead, which is typically reserved for males. Although the available data certainly do not prove the existence of non-

binary gender categories, they invite further study and hint at such possibilities, as well as the very real possibility that some manner of gender fluidity was allowed.



**Figure 4:** Image of burial 6 from Žerniki Górne showing a probable female between 25 and 30 years of age with a variation of a Le Fort type I fracture of the right midface. Photo by Mark Toussaint.

In terms of embodied social structures, this study also points to an increase in the risk of early childhood malnutrition or disease for “indeterminate” individuals versus males, as well as an increase in the incidence of antemortem trauma for females versus males. With regard to the indication that individuals of indeterminate sex showed higher

rates of LEH than males, this should be taken as extremely provisional, since there were only three individuals, total, that showed signs of LEH. With regard to antemortem trauma, however, all three females for which data on trauma was available had suffered some form of antemortem injury. The difference between males and females here may point to an increased risk for females of non-lethal trauma during their lives. One female individual in the study (Żerniki Górne, grave 6) suffered both antemortem and perimortem trauma. She showed signs of a healed rib fracture, a variation on a Le Fort type I fracture of the right midface (**Figure 4**), a symphyseal fracture of the mandible (**Figure 5**), and one or two other possible perimortem blunt-force traumas to the cranial vault. She also showed signs of potential decapitation (**Figure 6**) or—as reported for two individuals at the cemetery at Szarbia (Skalbmierz commune; different from the Szarbia included in this study)—an “artificially widened spinal aperture...evidence of endocanibalism” (Baczyńska, 1994, p.58). It should be noted that another (male) individual from Żerniki Górne (grave 52) showed almost the same trauma to the area surrounding the foramen magnum.

The lack of statistically significant results in the cluster analysis is likely due to a combination of factors: the small sample size, the small number of entheses included per individual, and the confounding factor of age. As described above, age is known to significantly correlate with enthesal development. Ideally, an analysis such as this would control for age. However, given the sample size for this case study, it would not have been feasible to do so. In future studies, after more data are gathered, cluster analyses will be conducted on individuals within the same age category, or after statistically controlling the raw data for age. Another factor to consider is that sex or gender may well not be the primary drivers of differences in labor patterns. It is likely that there are overlapping social



identities and roles that affect the types of stress placed on the musculoskeletal system. Nonetheless, I believe that this is a fruitful approach to the investigation of enthesal development in populations. For example, a study of an Early Bronze Age cemetery in Serbia by Porčić and Stafanović (2009) used a similar cluster analysis to show that “vertical status” (indexed by grave goods) interacted with sex, and different labor patterns were reflected in enthesal development depending on these categories. Such an approach has the potential to be particularly informative about individuals buried in unorthodox orientations, as well as other “atypical” individuals.



**Figure 5:** Image of burial 6 from Žerniki Górne showing a probable female between 25 and 30 years of age with symphyseal fracture of the mandible. Photo by Mark Toussaint.



**Figure 6:** Image of burial 6 from Žerniki Górne showing a probable female between 25 and 30 years of age with indications of possible decapitation or artificial widening of the foramen magnum. Photo by Mark Toussaint.

### *Conclusion*

Frontier zones, rather than representing blank-slate landscapes waiting to be colonized, are regions of interaction and exchange. They can be places where power is exercised in a stringent manner and where conformity is policed, or they can be places where individual agency, creativity, and hybridity flourish. The structural, spatial, and ideological particularities of frontier societies all impact the specific character of the

frontier zone. Gender provides a powerful lens through which to examine these phenomena, because it is a nexus where power, agency, and identity meet.

The Mierzanowice Culture populations in the northern Carpathian region provide a unique opportunity to study the interactions between gender and the frontier. Their dead were buried in particular orientations depending on sex and/or gender, perhaps among other variables. Furthermore, MC populations showed signs of regionalization and differentiation in the Late Phase, quite likely due to the interactions between Mierzanowice communities and communities of the Únětice and Otomani-Füzesabony cultural paradigms.

Although this case study was based on a small sample of individuals, a few patterns have begun to emerge. Certain aspects of burial orientations may correspond more to gender than to sex, as evidenced by one female who was buried along a typically male axis, but lying on her left side, which is typical for females. It is not out of the realm of possibility that such atypical burial orientations may correspond to a non-binary gender category. This preliminary study also indicated that while all individuals were at fairly equal risk of perimortem trauma, females were more likely than males to incur antemortem trauma.

In future studies, more data will be gathered from these and other Mierzanowice cemeteries to allow for the expansion of the sample size. Due to the limitations of the current sample size, changes in gender constructions over time in the “frontier zone” of the Mierzanowice region could not be explored. The majority of individuals included in this study were from the Late Phase of the Mierzanowice Culture. However, in the future, I will endeavor to collect data from earlier cemeteries or cemeteries of longer duration in order to more fully investigate the influence of surrounding cultural paradigms on how gender was conceptualized, actualized, and embodied in Mierzanowice communities.

### **CHAPTER 3: Further Analysis of Musculoskeletal Stress and Dental Pathologies**

The preceding chapter was based on the analysis of a subset of the overall dissertation data. It served to illuminate preliminary patterns and fruitful avenues of further investigation, as well as a proof of concept for the method of analysis developed therein for patterns of entheseal robusticity. Since the writing of that chapter, additional data was collected both from the sites represented in the initial data set as well as two other sites (Szarbia Zwierzyniecka and Kichary Nowe). As the sample sizes for analyses conducted in the preceding chapter were particularly small, the following provides more robust results based on the entirety of the collected data. Note that while individuals of indeterminate sex were treated as a separate category of analysis in the preceding chapter (for reasons of theoretical interest), the results below are based only on individuals whose sex could be confidently estimated as either male (probable males included) or female (probable females included).

#### *Osteoarthritis and Schmorl's Nodes*

Although the etiology of osteoarthritis (OA) is multifactorial, wear and tear on the joints is at the root of it. Similarly, Schmorl's nodes, which are areas of bone resorption on the superior and inferior surfaces of vertebral bodies, correlate with stresses placed on the spine (Waldron, 2009). Comparing the rates of OA and Schmorl's nodes between males and females is one way to infer the intensity and patterns of labor. Rates of OA are known to increase with age (ibid.), and it might reasonably be expected that the same would be true

of Schmorl's nodes; therefore, it is necessary to not only examine total their total rates among males and females, but to compare the data within each age category. Since the distribution of female samples in this data set tends to skew older than the male distribution, controlling for age is especially important.

The data on Schmorl's nodes and vertebral OA come from the cemeteries of Szarbia Zwierzyniecka and Kichary Nowe. In order to calculate rates of Schmorl's nodes, the total number of superior and inferior vertebral body surfaces for each individual were counted, as was each surface with a Schmorl's node. Counts were summed to find the total for males and for females. The state of preservation of the vertebrae necessitated this approach, since many vertebrae were only partially represented, and specific vertebrae could not always be confidently identified. Only vertebrae that were at least 50% complete were counted. Interestingly, males have higher rates (12/200; 5.7%) of Schmorl's nodes than females (5/204; 2.4%), though not significantly ( $p = 0.1355$ ; Fisher's Exact Test)—even though the female sample is older on average.

On the other hand, females have significantly higher rates of vertebral OA than males ( $p = 0.006981$ ;  $\chi^2$ ). This might be expected, given the different age distributions of males and females. However, the general result still holds when broken down by age category, though not to statistical significance at the  $\alpha = 0.5$  level. Among Middle Adults, 0/23 male specimens show signs of OA, compared to 6/51 (11.8%) of female specimens ( $p = 0.1745$ ; FET). In the oldest age category (which for this analysis was the pooled samples of Older Adults and those who were either in the Older or Middle Adult category, but could not be confidently assigned), 1/16 (6.3%) male vertebrae showed signs of OA, compared to 18/52 (34.6%) female vertebrae ( $p = 0.1043$ ; FET).

		Right Hip			Left Hip			Bilateral			Any Hip OA		
		Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.
<b>Young Adults</b>	Males	1/11	9.1%	0.3956	2/12	16.7%	1	1/10	10.0%	1	2/13	15.4%	0.4893
	Females	1/3	33.3%		0/3	0.0%		0/3	0.0%		1/3	33.3%	
<b>Middle Adults</b>	Males	0/9	0.0%	1	0/6	0.0%	1	0/5	0.0%	1	0/10	0.0%	0.375
	Females	0/5	0.0%		1/6	16.7%		0/5	0.0%		1/6	16.7%	
<b>Older Adults</b>	Males	0/0	N/A	N/A	0/0	N/A	N/A	0/0	N/A	N/A	0/0	N/A	N/A
	Females	2/4	50.0%		4/5	80.0%		2/3	66.7%		4/6	66.7%	
<b>All Adults</b>	Males	1/23	4.3%	0.1419	2/20	10.0%	0.1034	1/17	5.9%	0.5534	2/26	7.7%	0.0207
	Females	3/14	21.4%		6/16	37.5%		2/12	16.7%		7/18	38.9%	

**Table 4:** Rates of osteoarthritis of the hip joint in male and female samples. Differences that reach statistical significance at the 0.5 level are in italics.

		Right Shoulder			Left Shoulder			Bilateral			Any Shoulder OA		
		Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.
<b>Young Adults</b>	Males	1/7	14.3%	1	1/5	20.0%	1	0/5	0.0%	1	2/7	28.6%	1
	Females	0/2	0.0%		0/2	0.0%		0/2	0.0%		0/2	0.0%	
<b>Middle Adults</b>	Males	1/6	16.7%	1	1/3	33.3%	1	1/3	33.3%	0.4286	1/6	16.7%	1
	Females	1/5	20.0%		1/5	20.0%		0/4	0.0%		2/6	33.3%	
<b>Older Adults</b>	Males	0/0	N/A	N/A	0/1	0.0%	1	0/0	N/A	N/A	0/1	0.0%	1
	Females	2/3	33.3%		1/3	33.3%		1/3	33.3%		2/4	50.0%	
<b>All Adults</b>	Males	3/15	20.0%	1	3/12	25.0%	1	2/10	20.0%	1	4/17	23.5%	0.6976
	Females	3/11	27.3%		2/12	16.7%		1/10	10.0%		4/13	30.8%	

**Table 5:** Rates of osteoarthritis of the shoulder joint in male and female samples.

		Right Elbow			Left Elbow			Bilateral			Any Elbow OA		
		Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.
<b>Young Adults</b>	Males	1/11	9.1%	1	2/9	22.2%	1	1/9	11.1%	1	2/11	18.2%	1
	Females	0/3	0.0%		1/3	33.3%		0/2	0.0%		1/4	25.0%	
<b>Middle Adults</b>	Males	0/8	0.0%	0.2727	1/5	20.0%	1	0/4	0.0%	1	1/9	11.1%	1
	Females	1/3	33.3%		0/3	0.0%		0/3	0.0%		1/4	25.0%	
<b>Older Adults</b>	Males	0/1	0.0%	1	0/2	0.0%	1	0/1	0.0%	1	0/2	0.0%	1
	Females	0/5	0.0%		1/5	20.0%		0/3	0.0%		1/6	16.7%	
<b>All Adults</b>	Males	1/21	4.8%	1	3/18	16.7%	1	1/15	6.7%	1	3/24	12.5%	0.658
	Females	1/12	8.3%		2/12	16.7%		0/9	0.0%		3/15	20.0%	

**Table 6:** Rates of osteoarthritis of the elbow joint in male and female samples.

		Right Knee			Left Knee			Bilateral			Any Knee OA		
		Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.	Freq.	Percent	<i>p</i> -val.
<b>Young Adults</b>	Males	1/8	12.5%	0.3778	1/7	14.3%	1	1/6	16.7%	1	1/9	11.1%	0.4545
	Females	1/2	50.0%		0/2	0.0%		0/1	0.0%		1/3	33.3%	
<b>Middle Adults</b>	Males	1/6	16.7%	1	1/6	16.7%	1	1/5	20.0%	1	1/7	14.3%	1
	Females	0/3	0.0%		0/2	0.0%		0/2	0.0%		0/3	0.0%	
<b>Older Adults</b>	Males	0/1	0.0%	1	0/1	0.0%	1	0/1	0.0%	1	0/1	0.0%	1
	Females	1/5	20.0%		1/5	20.0%		0/5	0.0%		2/5	40.0%	
<b>All Adults</b>	Males	2/16	12.5%	1	2/16	12.5%	1	2/13	15.4%	0.4935	2/19	10.5%	0.6285
	Females	2/12	16.7%		1/11	9.1%		0/9	0.0%		3/14	21.4%	

**Table 7:** Rates of osteoarthritis of the knee joint in male and female samples.

The subset of data analyzed in the preceding chapter did not reveal any statistically significant differences in rates of OA between males and females in any of the reported joint systems; however, it was noted that differences in the shoulder and the hip came closest to significance. In the full data set, derived from all four sites (Szarbia, Szarbia Zwierzyniecka, Żerniki Górne, Kichary Nowe), differences in most joint systems were still non-significant. However, overall rates of OA in the hip did differ significantly between males and females ( $p = 0.0207$ ). The data show that females have higher rates of OA in the hip (**Table 4**), though to a large degree this likely has to do with the greater proportion of older females in the sample. However, females also have higher rates of hip OA in the Young Adult and Middle Adult categories, though not quite significantly.

While there were no significant differences found in analyses of the other joint systems (**Tables 5-7**), a couple of general observations can be made. Firstly, females have higher overall rates of OA in every investigated joint system. Although, again, a portion of this can be attributed to the older average age of females in the sample, the pattern holds true more often than not, even when controlling for age category. Secondly, males have higher rates of bilateral OA in all joint systems except the hip.

### *Dental Pathologies*

Analysis of dentition is an important part of bioarchaeological investigations for a number of reasons. Of no small importance is the fact that teeth preserve quite well in many situations and through a variety of taphonomic processes, even when bone may not. Moreover, the condition of the teeth, the alveoli, and the maxilla and mandible can reveal



much about diet, dental hygiene, the use of teeth as tools, and episodes of nutritional or metabolic stress. Linear enamel hypoplasia (LEH) is caused by a disturbance in the laying down of enamel during the development of the teeth. Although it is a nonspecific indicator of stress, it can be caused by malnutrition, infection and fever, or even the stress associated with weaning (Hammerl, 2013; Hillson, 2008; Waldron, 2009). Dental caries results from the demineralization of enamel caused by the breakdown of sugars and fermentable carbohydrates by bacteria (ibid). Thus, diets high in cariogenic substances, as well as poor dental hygiene contribute to the development of the disease. The presence of caries, along with severe dental attrition (due to coarse substances in food or the use of teeth as tools) can lead to inflammation and infection of the pulp inside the tooth, which can progress to periapical abscesses, granulomas, or cysts (Hillson, 2008). Finally, antemortem tooth loss (AMTL) is perhaps most often the result of periodontal disease, which is usually caused by pathogenic bacteria in plaque (Waldron, 2009). However, trauma is also a cause, and caries is an indirect cause—the pain and discomfort associated with caries may encourage individuals to extract the affected tooth (Hillson, 2008; Waldron, 2009).

In the preceding chapter, rates of LEH, caries, and AMTL were reported, and the only significant difference between the subgroups (males, females, indeterminate) was in the rate of LEH. Pairwise comparison showed a nearly significant difference between males and the indeterminate category. Because LEH form in childhood, and over the course of adulthood teeth are progressively worn down, the likelihood of identifying existing LEH depends on the age of the individual, the number of teeth present, and the rate of wear of the teeth. To control for this in the current analysis, a linear measure of the amount of enamel remaining on each tooth (from occlusal surface to the cemento-enamel junction)

was taken. Such measures were summed up for males and for females. The number of teeth displaying at least one LEH were also summed, and this was used to determine the ratio of number of teeth with LEH per millimeter of enamel. A test statistic was created by calculating the absolute value of the difference between the male and female ratios. A bootstrapped distribution of 10,000 such statistics was then created, and the probability of finding a value greater than the test statistic was determined. The result was that there was no significant difference in the rates of LEH between males and females (**Figure 7**).

However, the same procedure was repeated for west-east burials (typical for males) and east-west burials (typical for females) in order to increase the sample size (since burial orientation is possible to determine more frequently than sex). The west-east burials were found to have significantly higher rates of LEH than the east-west burials (**Figure 8**).

Because the average age of the female sample is greater than that of the male sample, and since the data show that the rate of dental attrition is greater for females than males (**Figure 9**), the same analysis was performed for the Young Adult age group. The results were consistent, though not quite significant at the 0.5 level ( $p = 0.0714$ ; **Figure 10**).

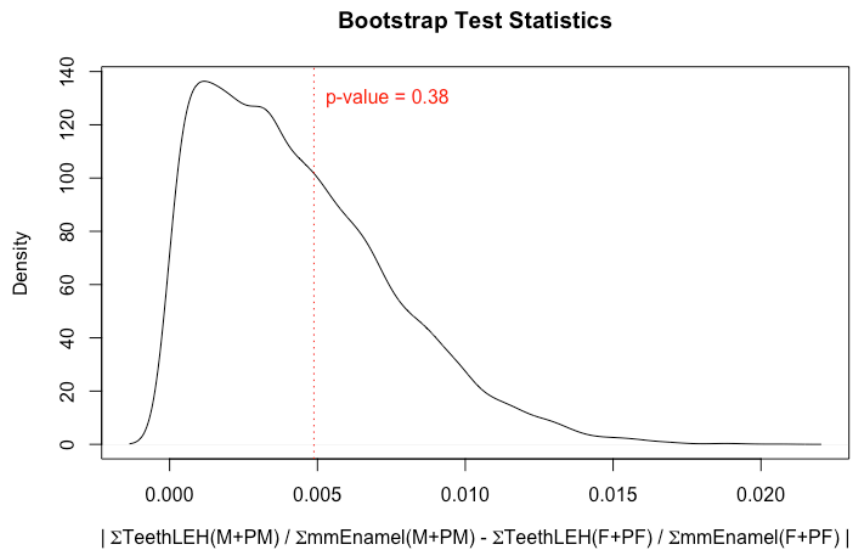
In the current analysis, the rates of caries, AMTL, and periapical lesions were also assessed. The only significant difference ( $p = 0.0135$ ; FET) was in the rates of periapical lesions between males (0/26 individuals) and females (4/15 individuals; 26.7%). The term “lesions” is used here due to the difficulty in differentiating between periapical abscesses, granulomas, and cysts in dry bone (Hillson, 2008). The difference in the rates of caries between males (24/600 teeth; 4.0%) and females (22/328 teeth; 6.7%) was nearly significant ( $p = 0.069308$ ;  $\chi^2$ ). This is not only an artifact of the older female sample. A comparison of caries rates for males (8/253 teeth; 3.2%) and females (8/99 teeth; 8.1%) in

the Middle Adult age group was significant ( $p = 0.046378$ ;  $\chi^2$ ). The symmetry between the higher rates of both caries and periapical lesions among females makes sense, as the former is a precursor for the latter, and as mentioned above, the rate of dental attrition is steeper for females than for males in this population. The difference in rates of AMTL was not significant (males: 14/27 individuals; females: 8/15 individuals;  $p = 1$ ; FET).

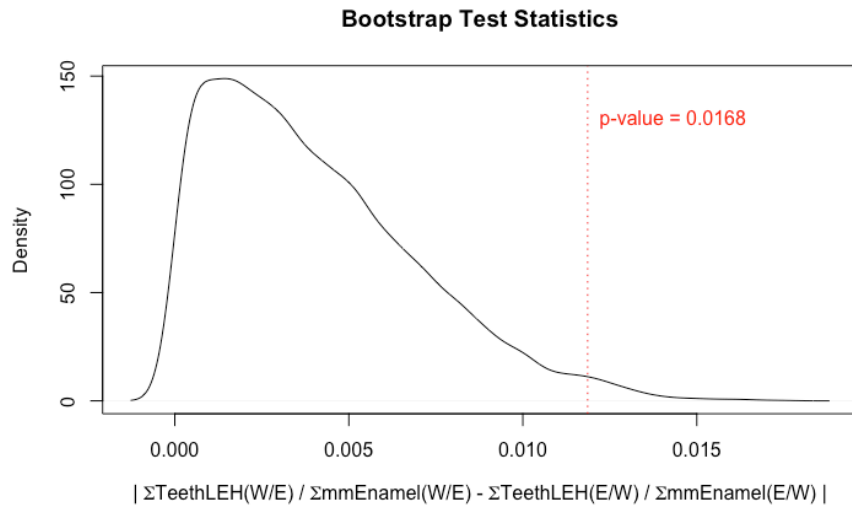
### *Other Analyses*

Since the writing of the previous chapter, additional data were also collected on enthesal robusticity. All adult individuals for whom the analyzed entheses were well preserved were included in the study. However, the same considerations of missing data made a comprehensive analysis of patterns of enthesal robusticity problematic. Although many dozens more individuals were investigated since the preceding chapter was written, the sample size available for a cluster analysis of select entheses remained quite small. Consequently, no further relationships between clusters and the variables of sex, burial orientation, and age category were able to be clarified.

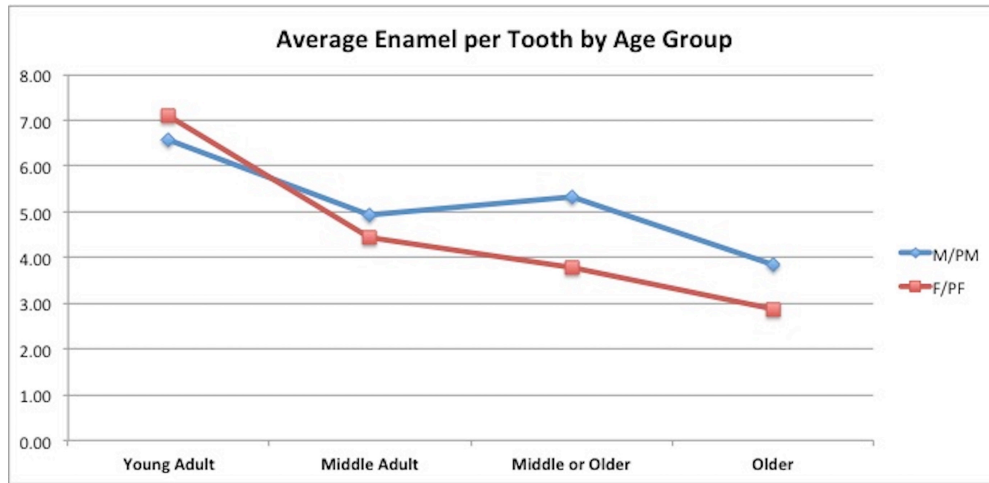
The following two articles (Toussaint 2019b; n.d) go into extensive detail on the remaining analyses begun in the preceding chapter. Namely, the next chapter (Toussaint 2019b) thoroughly discusses burials of atypical orientation in the complete data set, and the implications thereof as pertains to gender and the intersection of gender with age. The final article in this dissertation (Toussaint n.d.) looks at patterns of trauma and evidence of interpersonal violence among adult males and females in the complete data set.



**Figure 7:** Probability of observed difference in rates of LEH between males and females against 10,000 bootstrapped resamples.

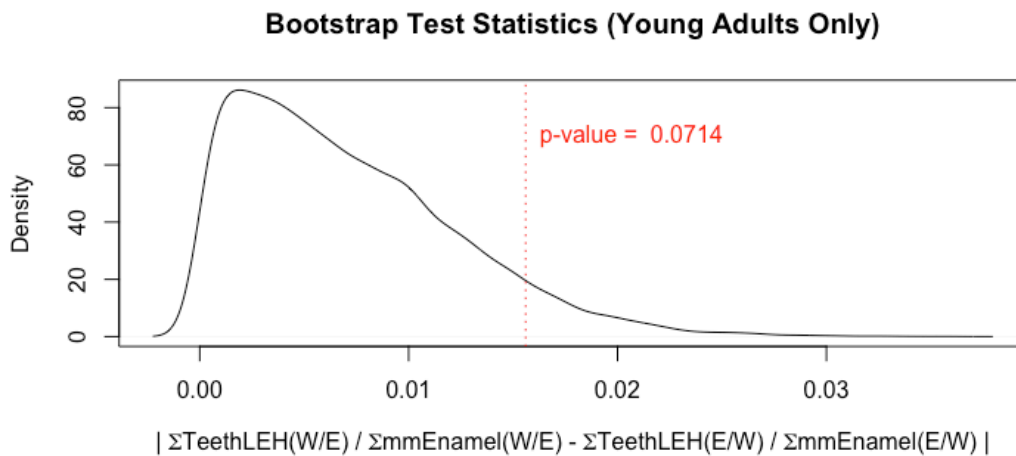


**Figure 8:** Probability of observed difference in rates of LEH between west-east burials and east-west burials against 10,000 bootstrapped resamples.



**Figure 9:** Average enamel per tooth (vertical distance from occlusal surface to cemento-enamel junction in millimeters) by age category for males and females.

M = male; PM = probable male; F = female; PM = probable female



**Figure 10:** Probability of observed difference in rates of LEH between west-east burials and east-west burials in the Young Adult age category against 10,000 bootstrapped resamples.

## **CHAPTER 4: The Dead Don't Bury Themselves: Reflections on Atypical Burial Arrangements and Gender in Mierzanowice Culture Cemeteries (Toussaint, 2019b)**

### *Abstract*

Many archaeological and bioarchaeological studies of the past—and too many in the present day—have confined their investigations of gender to an assumed male/female, man/woman binary. Many Early Bronze Age cemeteries in Central Europe offer the possibility of going beyond the binary, thanks to their richly and complexly gendered burial practices. In this study, 12 burials from three Mierzanowice Culture cemeteries in Poland are investigated bioarchaeologically. These burials are of particular interest because each one in its own way deviates from the typical manifestations of gender in the mortuary practices of this time. Questions are raised, and potential implications are discussed relating to conceptions of gender in these Early Bronze Age communities.

### *Introduction*

The Early Bronze Age saw the standardization of certain aspects of burial arrangements and orientations within various spheres of cultural contact throughout much of Central Europe. Influences from preceding cultural paradigms such as the Corded Ware and Bell Beaker phenomena were assimilated to varying degrees into unique regional expressions within the funerary sphere (Włodarczak, 2017b). Characteristics of burials that were typically standardized included the axis of the body with respect to cardinal

directions, the side of the body on which the deceased was placed, the direction of the face of the individual, and the suite of appropriate grave goods. For Únětice Culture (UC) burials, the axis differed regionally, but on the territory of modern-day Poland, it was typically N/S (Czebreszuk, 2013; Pokutta, 2013; Sosna, 2007; Vandkilde, 2007); for groups of the Circum-Carpathian Epi-Corded Culture Circle (ECC), including Mierzanowice Culture (MC) communities, the directional axis was usually E/W (Kadrow, 1994a; Kadrow & Machnik, 1997; Marková & Ilon, 2013).

An important distinction between these paradigms, however, is that the axis of the body appears to be a strongly gendered symbol in ECC regions, but not among UC groups. At Únětice Culture cemeteries in Poland, for example, most individuals in flat graves are laid on their right sides, with their heads to the south, feet to the north, facing east (Czebreszuk, 2013; Pokutta, 2013); some UC groups in Slovakia seem to follow directional and gendered aspects of ECC burials (Marková & Ilon, 2013). In Epi-Corded cemeteries, males and females are almost always buried in mirror-opposite positions: they lie on different sides (or at least with legs and head turned to different sides), with their heads to opposite ends of the compass, yet on the same axis. Throughout much of the ECC region, including among MC communities, males are on their right sides with their heads to the west and feet to the east, and females are on their left sides with their heads to the east and feet to the west (Czebreszuk, 2013; Kadrow, 1994a; Kadrow & Machnik, 1997; Marková & Ilon, 2013). In fact, this type of mirror-opposite, *seemingly* sex-based schema holds throughout a large portion of the Carpathian Basin (O'Shea 1996; Marková and Ilon 2013), and among what Helle Vandkilde (2007) calls the Danubian cultures. There are some regional differences with regard to which sides and directions are assigned to males versus

females, but the symbolism of both side and direction seems to have a gendered aspect throughout most of these territories.

Given the truism that “the dead don’t bury themselves,” and taking into account that mirror-opposite sex- (or gender-) based arrangements held in this region from approximately 2800/2700 BCE to around 1600 BCE (in Lesser Poland, in any case) (Kadrow & Machnik, 1997; Włodarczak, 2017b), one can assume that such burial characteristics are rooted in a deep ideology with certain conceptions of gender, and that, taphonomy aside, no aspect of the arrangement of a burial was “accidental.” For this reason, I believe it to be particularly informative to look at what might be called “atypical” burial orientations, or “exceptions to the rule.” Accordingly, in this paper, a dozen such burials from three MC cemeteries in Lesser Poland are examined—some for the first time. The goal is to examine the specifics of each case as well as any generalities, and to begin a conversation about how bioarchaeological approaches might help to shed light on conceptions of gender in Early Bronze Age Central Europe.

### *Theoretical Considerations Regarding Sex and Gender*

Sex and gender are still often conflated, or at least not properly differentiated in archaeological literature. For this reason, it is necessary to begin with the basic distinctions between the two. At the most fundamental level of the term, sex is the biological state of an individual as pertains to their primary and secondary sexual organs and characteristics. Gender, on the other hand, is the set of social meanings, values, and expectations placed on categories of sex.



The concept of gender as something related to, but distinct from biological sex, has been in existence since at least 1955, made explicit by psychologist and sexologist John Money ( Money 1955; Haig 2004). By the 1980s, considerable numbers of feminist scholars had adopted and expounded upon the concept of gender (Haig 2004). Perhaps the most common understanding of gender in its earliest usage in archaeology and bioarchaeology was as the sum of *social* conventions and expectations for behavior, personality, and performance based on biological sex; in other words, sex is biological and gender is cultural (e.g., Armelagos 1998; Johnson 2011). More recently, scholars such as Pamela Geller (2008; 2017) have called for bioarchaeologists to resist foisting the “presentist” schema of male/female, man/woman on the societies of the past that we study.

In fact, the ubiquity and antiquity of gender variants beyond the binary is well established. Herodotus mentions a category of “effeminate” men, “afflicted...with a feminizing disease,” among the Scythians, called “Enarees,” at least some of whom were soothsayers (I:105, IV:67). Serena Nanda (2014) documents many historic and ethnohistoric examples of gender variants, including Navajo *nádleeh*, Mohave *alyha* and *hwame*, Indian *hijras* and *sādhins*, and Albanian *burneshas*. Often called “sworn virgins,” *burneshas* have been reported among Albanian and western Balkan pastoralist populations since at least the 19<sup>th</sup> century. These biological females become gendered men, socially—often to fill the roles of sons in a family without suitable male heirs. They embody this new role through clothing, behavior, speech, and are afforded privileges typically reserved for biological males. Although everyone knows that they are not biologically males, they are generally treated as social men throughout their societies (Nanda 2014).

Regardless of the biological sex of these individuals, their gender variance is generally not recognized as a complete transition from man to woman, or vice versa, but rather as a different status altogether. Often, this involved being seen as having qualities of both men and women, or of being biologically one sex while taking on the gender typically associated with the other sex. In all of these examples, one of the defining characteristics of a gender variant is engaging in labor that is typically reserved for the opposite sex. The degree to which a gender variant would be allowed to participate in all social roles and enjoy all social privileges of the opposite sex/gender varied across cultures. One would expect the same would be true of how they were treated in death. As a case in point, René Grémeaux (1996) documents the funeral of one *burnesha* who was afforded the customary masculine ceremonial clothing for their burial, but was not given the traditional male funerary lamentation.

### *Bioarchaeological Approaches to Gender*

Gender is a complex phenomenon that arises out of the social categorization of biological differences, the imbueing of those categories with meaning, the definition of socially sanctioned roles associated with each category, and the performance and contestation of those roles by individuals (Butler, 2006; Nanda, 2014). And as gender is performed, practiced, and embodied throughout one's life, patterns of osteological "sedimentation" of biomechanical stresses and bodily modifications associated with these performances can be sought (Sofaer, 2006).

In the pursuit of information on gender in past societies, bioarchaeologists have variously looked at musculoskeletal stress indicators, pathological markers on bone, and traces of blunt- or sharp-force trauma. Such approaches have been used in studies that have been suggestive of gendered differences in labor practices (Larsen, 1998; Lorkiewicz, 2011; Milner & Larsen, 1991; Robb, 1997). Additionally, a large bioarchaeological literature exists regarding differential disease risk (Bird & Rieker, 2008; Grauer & Stuart-Macadam, 1998; Koziol, 2012; Martin, 1997) and exposure to violent trauma (Grauer & Stuart-Macadam, 1998; Koziol, 2012; Martin, 1997; Robb, 1997; Tung, 2012; Walker, 1997) based on salient social categories such as sex, gender, age, and occupation.

There have been relatively few bioarchaeological studies to address non-binary gender categories, but a couple are worth noting. Over a decade prior to Pamela Geller's appeal to bioarchaeologists, Hollimon (1996) used data on gendered patterns of degenerative joint disease and of grave goods, along with anthropologically estimated biological sex to infer the possible existence of "two-spirit" burials in a Chumash population. There are also notable studies pertaining to the possibility of gender variant burials in Early Bronze Age Europe. Sosna and colleagues (2008), for example, used a resampling approach at an Únětice cemetery in Rebešovice, Czechia, to demonstrate the near parity of treatments of males and females in terms of overall wealth and emphasis given to burials. More relevant for this paper, however, is their brief discussion of an individual of indeterminate sex, who exhibits both typically masculine and feminine burial characteristics. They entertain the possibility of a "gender transformer" (Sosna et al., 2008, p.352), but claim that an elite female with masculine traits attached to her position is more likely.

At least one study has used ancient DNA to examine the concordance between “archaeologically” sexed individuals (using burial orientation and grave goods) and their genetic sex according to the presence or absence of the SRY gene. In this study, Michaela Vaňharová and Eva Drozdová (2008) were able to extract DNA from 21 individuals, including mostly juveniles and children. They found that, of 13 typically masculine burial configurations, there was one female of indeterminate age. More strikingly, of seven typically feminine burials, six were of biological males, including three young children and three individuals ranging between 15 and 22 years of age. Although they decline to speculate on the significance of this discordance, Jan Turek (2016) writes of the possibility that either the males buried in typically feminine arrangements may have been meant to be raised as (social) women, or on the other hand, they may not yet have undergone a rite of passage to attain full status as a man. As a final example, Porčić and Stafanović (2009), in their study of the Early Bronze Age cemetery at Mokrin in Serbia, used a cluster analysis of enthesal development to show that different labor divisions and practices interacted with sex and status, as indexed by grave goods. Approaches such as this, which take account of musculoskeletal stress indicators in a holistic sense, have the potential to be particularly informative about individuals buried in an “atypical” manner, and also about divisions of labor beyond the binary.

### *Background of Region and Sites in Current Analysis*

The burials examined in this paper come from cemeteries of the Mierzanowice Culture in Lesser Poland. Generally, in this region, sites and cemeteries are located in the

loess upland areas, although additional environments are exploited and settled increasingly in the later stages of the MC. The Mierzanowice Culture can be dated to between 2400/2300 BCE and about 1600 BCE at the latest (Górski et al., 2013; Kadrow & Machnik, 1997; Włodarczak, 2017b). The phenomenon is divided into Proto-Mierzanowice (~2400/2300 – 2200 BCE), Early Mierzanowice (~2200 – 2050 BCE), Classic (beginning around 2050), and Late (beginning between 1950/1750 and ending between 1950/1600, depending on the region and group) Phases (Kadrow and Machnik 1997; Włodarczak 2017). The Late Phase saw increasing regionalization of ceramic styles, diversification of settlement types and burial grounds, an increase in craft specialization, and a growing emphasis on the status of deceased individuals, as indicated by the uneven distribution of prestige goods in graves (Włodarczak 2017). However, the principal features of burial arrangements and orientations remained largely the same over the territory of MC groups in Lesser Poland. In particular, this includes the aforementioned gendered aspects relating to the placement of the body.

As previously discussed, at MC sites in Lesser Poland, the majority of burials tend to be oriented about an E/W axis (with a certain amount of angular variation around this axis)—males with their heads to the west, females with their heads to the east, in each case with the face directed to the south. As this arrangement would imply, males are typically buried on their right sides (or on their backs, with their legs and heads turned to the right) and females on their left sides. Although the sex of subadults cannot be reliably estimated, their burials seem to follow a similar pattern. Out of 121 individuals from four MC cemeteries (Szarbia, Szarbia Zwierzyniecka, Żerniki Górne, Kichary Nowe) for whom burial orientations could be reliably ascertained, about 61% of subadults were buried W/E (head

to the west), compared to 56.6% of adults, and 39% were buried E/W, compared with 41.7% of adults (the remaining 1.7% of adults were buried along a N/S axis).

There are at least three components of a burial that seem to be gendered: the primary axis of the body (including direction of the head and feet) and, to some extent, certain grave goods (see **Summaries of Atypical Burials** below)—but also, the side on which the deceased is buried. Most often, the side and the axis follow a normative pattern (W/E – R side; E/W – L side). However, in a minority of cases, individuals are buried facing north, which also means that the typical complement of axis and side is violated: for example, individuals buried W/E, but on their left side, or individuals buried E/W, but on their right side. The symbolic significance of this arrangement should not be taken for granted. It is possible that, since both axis and side are gendered, this combination of differently gendered components has a social significance regarding the status of the individuals. It is equally possible that it is rather the unorthodox positioning of the face to the north that takes precedence, and the side on which the body is laid is but a side effect. Either way, this phenomenon seems to happen at many MC cemeteries at small, but not insignificant frequencies. In Part I of his two-volume work on MC cemeteries of the Sandomierz Uplands, Jerzy Bąbel gives a tally, in Table 14, of the orientations of the faces of 169 individuals from seven sites (Bąbel, 2013a, p.78). The table shows that 8/169 individuals, or about 4.73%, were buried facing north. Furthermore, I was able to calculate, using information from Kadrow and colleagues on the cemetery at Iwanowice, Babia Góra (Kadrow et al. 1992), that of 82 adults for whom sex, burial axis, and side could be reliably estimated, one (1.2%) was buried facing north (female; E/W – R). Similarly, one (3.8%) out of 26 subadults was buried facing north (W/E – L), for a total of 2/108, or about 1.9% of

individuals for whom the necessary information could be estimated. It is worth noting that this subadult individual—actually a juvenile of about 17-18 years of age—was estimated to be male, and was lying in a double grave with another juvenile, estimated to be male; the two individuals appear to be facing one another.

In this paper, burials that are “atypical” in some aspect of the usual gendered signifiers are investigated from three cemeteries of the MC: Szarbia Zwierzyniecka, Żerniki Górne, and Szarbia (Koniusza commune). Excavations at Szarbia Zwierzyniecka (Skalbmierz Commune, Kazimierza County, Świętokrzyskie Province) were carried out between 1980 and 1985, and were led by Barbara Baczyńska. The cemetery, which was the focus of the research, was located next to a settlement, and is estimated to have included approximately 540 graves in total. The excavated portion included 82 human burials. The cemetery appears to have functioned from the Classic through the Late Phase of the MC. Radiocarbon dates from both the settlement site and the cemetery indicate that the existence of the settlement complex was from about 2130-1664 BCE (Baczyńska, 1994). The cemetery at Żerniki Górne (Busko-Zdrój Commune, Busko County, Świętokrzyskie Province) was a multi-period site (Corded Ware, Bell Beaker, Mierzanowice, Trzciniec) that was primarily excavated between 1965 and 1968 by Andrzej Kempisty (Kempisty, 1978). In all, 39 burials of the MC were uncovered. Finally, the cemetery at Szarbia (Koniusza Commune, Proszowice County, Lesser Poland Province) was excavated in the year 2000 by Barbara Baczyńska. In all, 44 graves of the Mierzanowice Culture were discovered. As this was a rescue excavation, only the most endangered portion of the cemetery was excavated. The majority of the burials come from the Late Phase of the MC, with a small number coming from the later part of the Classic Phase (Baczyńska, 2000b).

Two of the three sites have previously been investigated anthropologically to some degree. Szarbia Zwierzyniecka was analyzed by Elżbieta Haduch (1997). In her analysis, Haduch estimated the sex and age of the individuals as well as trauma and pathologies, such as cribra orbitalia (Gleń-Haduch et al., 1997; Haduch, 1997). A large portion of the published anthropological monograph focused on morphological and craniometric aspects of the skeletons. The skeletons from Żerniki Górne were investigated by Andrzej Wierciński and Alina Wiercińska (Kempisty 1978). The primary analyses carried out seem to have been estimations of age and sex. A later study (Tomczyk et al., 2012) was carried out, looking at the frequency of linear enamel hypoplasia (LEH), but the article indicates that only the Corded Ware and Trzciniec burials were analyzed. No specific mention of MC individuals was made, although it is possible that they were subsumed into one or the other group. The Szarbia site (Koniusza Commune) had not been previously analyzed by an anthropologist. The estimations and determinations (sex, age, pathology, trauma, entheses, etc.) used in the current paper are those carried out by the author (regardless of whether they were previously conducted) to ensure intraobserver consistency.

### *Methods*

Multiple anthropological methods were used in the estimation of the sex and age of individuals, and a composite result was obtained for each individual. For age estimation of adults, features of the pelvis were analyzed using the methods of Brooks and Suchey (1990), Todd (1920, 1921), and Lovejoy and colleagues (1985). Suture closure of the cranium was assessed per Meindl and Lovejoy (1985) and Buikstra and Ubelaker (1994).



Where such methods were of little use due to lack of diagnostic features or taphonomy, dental attrition (Lovejoy, 1985) was assessed. When possible, greater weight was given to indicators of the pelvic region for adults with fully fused epiphyses. Scheuer and Black (2000) and Buikstra and Ubelaker (1994) were used to estimate age for younger individuals based on long-bone fusion, and methods compiled in Bass (2005) and White and Folkens (2005) were used to estimate age based on stages of tooth development and eruption.

Estimation of sex was carried out using the heuristics detailed in Buikstra and Ubelaker (1994), including the characteristics of the ischio-pubic region as described by Phenice (1969). However, given the lack, or taphonomic degeneration of the ischio-pubic region for many individuals, as well as the subjective nature of categorical assessments of the greater sciatic notch (especially in cases of individuals who do not fall at the extremes), the multi-component method of Jaroslav Bruzek (2002) was also used. Where there was a slight disagreement between methods (e.g., probable male vs. male, or indeterminate vs. male), the more robust methods were given extra weight. However, in the case of extreme disparity in results or where a high degree of ambiguity existed, the sex was considered “indeterminate.”

This study also attempted to document, where possible, skeletal indicators of nutritional insufficiency (e.g., porotic hyperostosis, cribra orbitalia, rickets, scurvy), dental disease (e.g., caries, antemortem tooth loss, abscesses, linear enamel hypoplasia or LEH), infection (e.g., osteomyelitis, periostitis), and general indicators of health, such as adult stature, using the methods described in Ortner (2003), Ruff et al. (2012), Waldron (2009), Mann and Hunt (2005), and Buikstra and Ubelaker (1994). Individuals were also inspected

for blunt force and sharp force trauma, including cranial depression fractures, radiating fractures, spiral fractures, parry fractures, cutmarks, and percussion marks, using the methods of Wedel and Galloway (2014).

Given the aforementioned significance of divisions of labor in social constructions of gender, indicators of musculoskeletal stress were also recorded. Here, musculoskeletal stress is used to signify any load or biomechanical demand placed upon the skeletal system. Markers of musculoskeletal stress that were investigated in this study included osteoarthritis (marginal osteophytes, eburnation, new bone formation, pitting)—which is pathological and related to multiple factors including age and biomechanical stresses (Waldron 2009)—and enthesal development. In this study, it is enthesal robusticity that was recorded, and not enthesal changes in a pathological sense. Osteoarthritic changes were evaluated per Waldron (2009) and Mann and Hunt (2005).

### *Summaries of Atypical Burials*

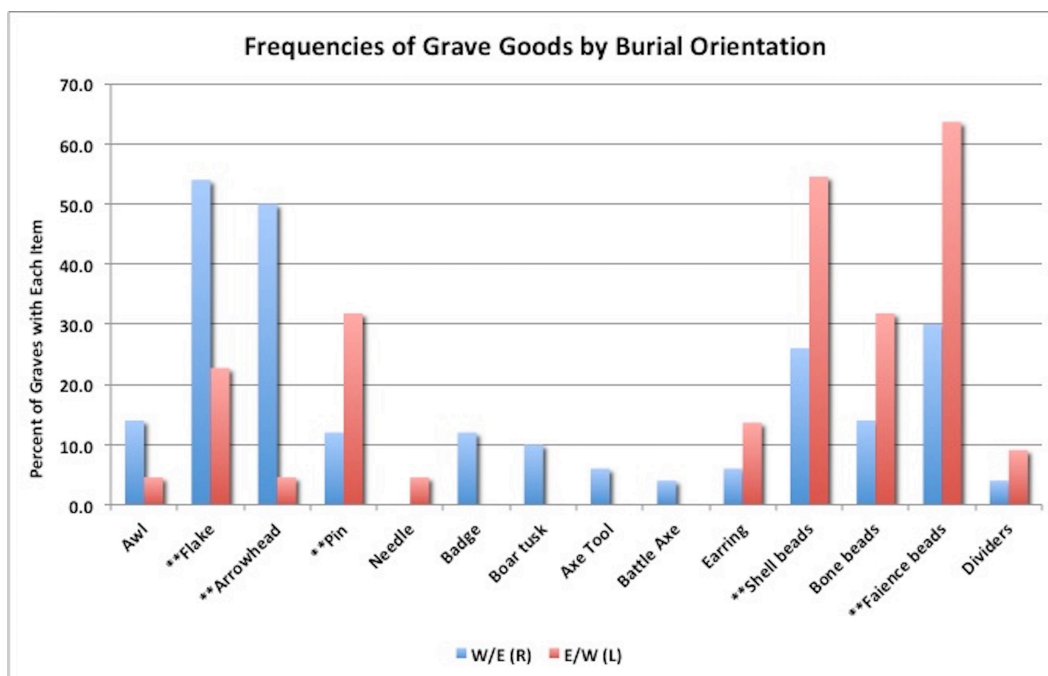
The graves described below (summarized in **Table 8**) are all unusual in some typically gendered aspect of their burial regimes. Two of them are males (one probable male) buried in the gendered female orientation (E/W – L). One is an individual buried E/W – L, but with a masculine grave offering. Nine are buried on an east-west axis (some E/W, others W/E), but are facing north.

Grave	Axis	Side	Sex	Age	Grave Goods	Pathologies
SZ 5/V	E/W	L	M	MA	ceramics, 70 faience & 30 shell beads, 2 bone pins	Spondylolysis L4
SZ 19/XI	E/W	L	PM?	MA/OA	3 bronze earrings, 5 faience beads, 10 shell beads, ceramic fragments, flint flakes	caries (1 tooth), AMTL (2 teeth)
S 50	E/W	L	I (F?)	MA	125 shell beads, 1 arrowhead	OA on thoracic vert., abscess above M1?
S 37	W/E	L	PF	MA	1 bronze ornament ( <i>blaszka/okucie</i> ), 1 bronze willow-leaf ornament, bone pin fragment	caries (1 tooth), OA on L5
S 21	E/W	R	UD (F?)	YA	None	<i>cribra orbitalia</i> , LEH (9 teeth), OA on dens of C2
SZ 3/III	E/W	R	UD (M?)	UA	50 shell beads, 1 faience bead, 1 bone divider, 1 clamshell disk ( <i>tarczka</i> ), flint flakes, ceramic frags	Schmorl's node on 1 vert
SZ 7/XI	E/W	R	UD	UA	42 shell beads, 19 bone beads, 6 faience beads, 1 clamshell divider, flint flakes, ceramic frags	None
S 35a	W/E	L	N/A	SA (1-3)	1 bronze earring, 1 bone pin	None
SZ 1/III	E/W	R	N/A	SA (8-12)	7 faience beads, ceramic frags, potsherds, bovine femur	<i>cribra orbitalia</i> , caries (1 tooth)
S 26	W/E	R	N/A	SA (10-12)	myriad shell beads, 16 shell pendants, 1 bone pin	None
S 26	E/W	R	PF?	J/YA (16-22)	shell beads, 13 faience beads, 3 animal-tooth pendants	caries (1 tooth), AMTL, (2 teeth)
SZ 23/IX	E/W	R	M?	UA	clay pot, 1 faience bead?, frags of boar-tusk pendant?	OA (shoulder & 5 verts)
SZ 23/IX	?	?	N/A	SA (2-4)	1 faience bead?, fragments of boar-tusk pendant?	None
Z 75	E/W	R	UD (M?)	UA	1 awl, 1 pendant (unspecified material)	perimortem ulnar & radial fractures
Z 75	?	?	N/A	SA (?)	None	None

**Table 8:** Summarizing information for atypical burials. M = male, PM = prob. male, I = indeterminate, PF = prob. female, F = female, UD = unable to determine, SA = subadult, J = juvenile, YA = young adult, MA = middle adult, OA = older adult, UA = unspecified adult, AMTL = antemortem tooth loss, OA = osteoarthritis, LEH = linear enamel hypoplasia

Grave goods at these cemeteries are found in burials of males, females, and children, and they appear to be gendered as well. By “gendered,” here, I mean that certain items are statistically more frequently associated with particular burial orientations, which are most often associated with a particular sex—though, importantly, not always. As Mike Parker Pearson points out, funerary practices—including bodily treatment, orientation, and adornment—create an “idealized representation – a ‘re-presenting’ of the individual by others...” (1999, p.4). Although the clothing, adornments, and items given the deceased for burial may or may not have been owned or used by the dead during life, they capture some reality of the perception of the dead by the living. It is this idealized presentation that makes grave goods so informative about the social construction of gender in a society.

For many types of grave goods found at these cemeteries, there is more fluidity than might be indicated by the burial orientations. According to existing literature, items which are primarily reserved for male graves include stone battle axes, arrowheads and stone wrist guards, boar-tusk pendants, discs or badges (in the Polish literature, variously: *tarczki, blaszki*) made of bone or copper, and sometimes pins and antler artifacts. Predominantly female items include beads of bone and mussel shell (used in necklaces and other manner of jewelry), necklaces of animal teeth, copper or bronze spiral-shaped earrings, and needles (Baczyńska 1994; Kadrow 1994b; Kadrow & Machnik 1997). Although they are apparently more prevalent in female graves, beads of bone and mussel shell can be found in the graves of males as well.



**Figure 11:** Frequencies of grave goods by burial orientation. Percent of burials in “masculinized” and “feminized” orientations that include each type of grave good. A double asterisk (\*\*) next to the grave good indicates a statistically significant difference in frequency between burial orientations. W/E(R) = “masculinized” orientation: head west, feet east, on right side; E/W(L) = “feminized” orientation: head east, feet west, on left side.

As part of the analysis for this paper, grave goods from the three cemeteries in question were divided into 25 categories and tallied based on whether they were found in burials of W/E – R oriented individuals or E/W – L alignments (for this part of the analysis, the north-facing burials were omitted). Most items could be found in either type of grave, but there were a handful found only in one orientation or another. Boar tusk pendants, stone “battle axes,” flint axe tools, and “badges” could only be found in the “masculinized” orientations. Needles (*igły*, in the Polish literature) were restricted to the “feminized”

orientations, but it should be noted that out of 72 of the investigated graves, only one needle was found; moreover, it is not clear whether pins (*szpilki*), which are found in graves of both orientations, and needles (*igły*) are always clearly differentiated in the literature. Statistical analysis of the frequencies of each class of objects in the different orientations showed a significant difference in only five of the categories (see **Figure 11**): arrowheads and flint flakes (including items given variously as *odłupek*, *łuszczeń* in the Polish literature) were found significantly more often in W/E – R orientations, whereas pins, shell beads, and faience beads were found more frequently in E/W – L orientations (chi-square or Fisher’s exact test, depending on the frequencies;  $p < 0.05$ ).

#### *Males or Probable Males in E/W – L Orientations*

##### Szarbia Zwierzyniecka: Grave 5/V

The individual in grave 5/V is buried along an E/W axis, with their legs (and presumably their head) turned to the left, which is a typically “feminine” burial orientation. The lower half of the skeleton is in anatomical position, while the upper part has been secondarily displaced and mixed. The individual was buried in a Late Phase grave pit that was partially dug into a Classic Phase settlement pit (Baczyńska, 1994). Grave goods include ceramics, 70 faience beads, 30 shell beads, and two bone pins. Although none of these are exclusively diagnostic of feminine graves, the complement of grave goods fits the feminine schema well. Elżbieta Haduch estimated the individual to be a male of age category *maturus/senilis*,

approximately 50 years old (Baczyńska, 1994; Haduch, 1997). My assessment largely concurs; the individual is clearly male (based on pelvic morphology—the skull is missing), probably in the Middle Adult age category (35-49 years; Buikstra & Ubelaker, 1994).

Due to the lack of a skull, many classic paleopathological indicators were not able to be assessed. However, out of 12 present vertebrae, no Schmorl's nodes were found, nor were any osteoarthritic changes noted. Neither was osteoarthritis noted in any of the major joint systems (shoulder, elbow, hip, knee). The only pathological change noted was spondylolysis in the fourth lumbar vertebra (L4). This was also noted by Haduch (1997), who additionally mentioned traces of spondyloarthrosis in thoracic vertebra 12 (T12) and L1 and L2. She connected these pathologies to scoliosis. According to the summaries of Waldron (2009) and Mann and Hunt (2005), the exact causes of spondylolysis are unknown, and may be congenital, stress-related, or both. However, these sources also state that biomechanical stress is likely to play a part. This is a condition that seems to be acquired in childhood, and is more common in males than females.

Szarbia Zwierzyniecka: Grave 19/XI

This individual was preserved in a highly fragmented state, and was also buried in the typically “feminine” orientation (E/W – L), based on the positions of the remaining bones (Baczyńska, 1994). Haduch (1997) lists the individual as a female of age group *senilis*, more than 60 years old. In my analysis, I was unable to locate any diagnostic fragments of the pelvis, and based on a rather masculine skull (especially with mastoids, supraorbital margins, and nuchal crest scoring a 4 out of 5 on the scale given in Buikstra &

Ubelaker, 1994), I estimated the individual to be a “Probable Male.” Given the poor preservation of the exocranial surface, my age estimate of Middle or Older Adult was based on extreme tooth wear. One caveat with regard to sex estimation based solely on the skulls of older individuals is that traits of female skulls are known to masculinize somewhat with increasing age (Meindl et al., 1985). The individual was buried with three bronze earrings, five faience beads, 10 shell beads, ceramic fragments, and flint flakes. These grave goods mostly follow a typically “feminine” pattern, but it is worth noting that, although flint flakes are not exclusively “masculine” items, they are found statistically more often in W/E – R graves.

Due to missing skeletal elements and poor preservation, none of the osteoarthritic changes could be assessed. The one orbital present did not show signs of *cribra orbitalia*. Out of 16 present teeth, no linear enamel hypoplasia (LEH) and no abscesses were noted. However, one instance of caries and two instances of antemortem tooth loss (AMTL) were found.

*(Possible) Female with Masculine Grave Offering*

Szarbia (Koniusza Commune): Grave 50

The individual in grave 50 was lying on their left side, head to the east, feet to the west—the prototypical “feminine” burial position. Found in the grave were 125 shell beads and one heart-shaped arrowhead, discovered under the left elbow of the individual (Baczyńska, 2000a). The shell beads can, as mentioned previously, be found in both



“masculine” and “feminine” grave orientations, but are more common in E/W – L arrangements. However, arrowheads are nearly exclusively found in W/E – R orientations. They form an essentially “masculinized” category of grave goods. There was no indication of sharp force trauma on this individual that would suggest the arrowhead was in the grave as a result of injury.

As for the sex of the individual, it is a rather complicated issue. On the one hand, the greater sciatic notch appears to score a 5 (female) on the 1-to-5 scale as presented in Buikstra and Ubelaker (1994). However, the picture is a bit more ambiguous using the methods laid out in Bruzek (2002). The shape and symmetry of the greater sciatic notch register as female, but both the preauricular sulcus and the composite arch register as male. The preauricular sulcus is shallow, with an open circumference, which is given in Bruzek (2002) as being seen more frequently in males. Furthermore, the features of the skull are intermediately robust, most scoring a 3 on the 1-to-5 scale mentioned above, which is “indeterminate.” I estimated the individual to fall into the Middle Adult age category, perhaps between about 40 and 50 years of age, based primarily on vault fusion and tooth wear; the pubic symphysis was not preserved and the auricular surface was too taphonomically altered to assess with any degree of confidence.

Based on the available indicators, the individual seems to have enjoyed relative health in life. Out of 21 teeth present, there were no signs of caries or LEH. No AMTL was noted. There may have been an abscess into the left maxillary sinus above M<sup>1</sup>, but taphonomic changes make it difficult to say definitively. No *cribra orbitalia* nor porotic hyperostosis were visible. Out of nine remaining vertebra, no Schmorl’s nodes were present, and only one thoracic vertebra showed slight signs of osteoarthritis (OA). Of the

two major joint systems that were able to be analyzed (shoulder and hip), no OA was seen. Traces of trauma were also absent.

### *Single, Adult Burials Facing North*

#### Szarbia (Koniusza Commune): Grave 37

The individual in grave 37 was buried W/E, on their left side, facing north (see **Figure 12**). Analysis of diagnostic traits led to a biological categorization of the individual as a Probable Female. Both cranial and pelvic traits support this estimation.

Anthropological analysis indicates that she was a Middle Adult (perhaps between 35 and 45 years of age). The individual was richly endowed with grave goods. Among the inventory of the grave were: a bronze adornment (*blaszka/okucie*) probably used as part of a belt, a bronze ring-like ornament with a willow-leaf motif, part of a bone pin, a fragment of a boar tusk pendant, a miscellaneous bone tool, two animal teeth, 275 shell beads, 51 shell dividers, 47 bone beads, and four faience beads (Baczyńska, 2000a). As described above, boar tusk ornaments and items described as *blaszki* are usually found in “masculine” burial orientations. The other items are either not gender-specific, or are found more frequently in graves of “feminine” orientation.

Only two pathologies were noted on the skeleton. One out of 18 teeth presented with caries. Of the three vertebrae present, one (L5) showed signs of osteoarthritis. There were no traces of trauma on the skeleton.



**Figure 12:** Grave 37, Szarbia (Koniusza Commune). Probable female, middle adult. Laid along a W/E axis, on left side of body, face looking north. Photo by Piotr Włodarczak.

#### Szarbia (Koniusza Commune): Grave 21

This individual was buried E/W, on their right side, facing north (Baczyńska, 2000b; **Figure 13**). Features of the skull are rather gracile. The pelvis is fragmented, making sex estimation difficult. The greater sciatic notch appears to register as a 2 or 3 on the 1-to-5 scale. Use of the methods described in Bruzek (2002) was largely rendered unfeasible due to the state of preservation of the pelvis. As a whole, the skeleton appears more feminine than masculine, but based on the state of preservation, I am not comfortable making a strict anthropological determination. The individual appears to be a Young Adult (perhaps

between 20-25/30) based primarily on tooth eruption and wear. No grave goods were found with this individual.

One of the orbits of the individual shows slight traces of *cribra orbitalia*. Of the 30 teeth present, none show signs of caries, but nine exhibit LEH. Neither AMTL nor abscesses are visible. There is no porotic hyperostosis, and none of the major joint systems show signs of osteoarthritis. The dens of C2, however, does show some traces of OA, particularly with the partial ossification of the apical odontoid ligament. There are no Schmorl's nodes present in any of the nine preserved vertebrae.



**Figure 13:** Grave 21, Szarbia (Koniusza Commune). Sex indeterminate (possible female?), young adult. Laid along an E/W axis, on right side of body, face looking north. Photo by Piotr Włodarczak.

## Szarbia Zwierzyniecka: Grave 3/III

In grave 3/III, a fragmentarily preserved skeleton, secondarily disturbed, was found. On the basis of the lower limbs, which appear not to have been moved, the original position of the skeleton was thought to be E/W – R (Baczyńska, 1994). Based on the fusion and size of the long bones, Haduch (1997) suggested that the individual was an adult male. I refrained from estimating sex, given the lack of diagnostic elements, but the individual was certainly an adult—though which stage of adulthood is unclear. The individual was buried with 50 shell beads, one faience bead, one bone divider, one clamshell disk/badge (*tarczka*), a lenticular flint knife, flint flakes, and fragments of ceramics. Again, the disk/badge seems to be rather firmly connected with a masculine presentation, as do the flint flakes, although they can be found in graves of “feminine” orientation as well. The shell and faience beads are found more often, but by no means exclusively, in E/W – L graves.

Only one tooth and one vertebra were present. The tooth showed no signs of either LEH or caries. The vertebra presented with a Schmorl’s node, but no OA. The only joint that could be assessed was the shoulder, and no OA was found. Additionally, no traces of trauma were seen on the remains.

It is worth noting that Haduch (1997) also indicated the presence of two lumbar vertebrae and some fragments of forearm bones of a subadult. I did not make note of these in my assessment. Nonetheless, it should be considered that this may have been some form of a double burial (see below), but this is unclear.

## Szarbia Zwierzyniecka: Grave 7/XI

The highly fragmented skeleton in grave 7/XI was scattered throughout various levels of the excavated pit. Based on the positions of the tibiae at the lowest level of the pit (where the largest group of bones was found), it was estimated that the initial orientation of the body was E/W – R (Baczyńska, 1994; Haduch, 1997). It should be mentioned, however, that such an orientation is difficult to reconstruct in the illustration given, which appears to better correspond to a W/E – R orientation. There were no diagnostic elements available to make an estimate of sex or age, except to say that the individual was certainly an adult. As for grave goods, they were similarly disbursed throughout different levels of the pit. Items in the grave included 42 shell beads, 19 bone beads, six faience beads, a divider made out of clamshell, flint flakes, and ceramic fragments.

Very little was available to assess for pathologies, particularly considering that no skull was present. No traces of OA were found on the articular surfaces of the tibiae. There was also no evidence of trauma on any preserved elements.

### *Single, Subadult Burials Facing North*

## Szarbia (Koniusza Commune): Grave 35a

In grave 35a, a highly fragmented and secondarily disturbed subadult skeleton was found. It was inferred that the initial position of the individual was W/E – L (Baczyńska, 2000a). Additionally, a layer of residue from burning, mixed with loess, was discovered

where the legs of the individual should be. Based on tooth eruption, the individual was between 1 and 3 years of age. The child was buried with one bronze earring and one bone pin. Interestingly, in the site report, Baczyńska (2000b) notes that the grave pit is undoubtedly too large for this individual; this raises the possibility that perhaps it was prepared with a double burial in mind—eventually.

Eight teeth were present, none of which showed signs of LEH or caries. No traces of *cribra orbitalia* or porotic hyperostosis were found, and no signs of trauma either.

#### Szarbia Zwierzyniecka: Grave 1/III

The skeleton in this grave was incomplete, and secondarily disturbed. Based on the position of the skull and the lower limb bones (which seem to be the only parts of the skeleton in the original position), the individual was laid on their right side, with their head to the east and feet to the west. The state of fusion of the various bones and the degree of tooth eruption indicate an age of approximately 8-12 years. This is in fairly close agreement with the age estimated by Haduch (1997): 12-14 years. The child in the grave was found with seven faience beads, ceramic fragments and potsherds, and the femur of a cow (Baczyńska, 1994).

As for pathologies of the cranium, one of the orbits showed slight traces of *cribra orbitalia*. No porotic hyperostosis was found. Of 25 teeth, one was affected by caries, but none bore signs of LEH. No traces of trauma were found on the bones.

*Double Burials, One Individual Facing North*

Szarbia (Koniusza Commune): Grave 26

This is an interesting case of a double burial in which the deceased are aligned along the same axis, but different orientations. Individual I lay with their head to the west, feet to the east, facing south. Individual II lay with their head to the east, feet to the west, facing north. Thus, they are both on their right sides. It should be noted, however, that both skeletons are incomplete and bones are secondarily disturbed. Of individual II, primarily the skull and upper and lower limb bones remain. In the site report, Baczyńska (2000b) notes that although it is difficult to say much about the original orientation of individual II, the position of the hands suggests that they were on their right side (and thus, facing north). Furthermore, it seems as though individual I was placed into the grave first, and later, individual II was moved into the same grave.

Near the head and neck of individual I, numerous shell beads, 16 shell pendants, and a bone pin were found. Additionally, more shell beads, 13 faience beads, and three animal-tooth pendants were found near the chest of individual II. Tooth eruption indicates that individual I is a subadult, between the ages of 10 and 12. Based on a combination of tooth eruption and tooth wear, individual II is either a Young Adult or juvenile, between 16 and 22 years of age. Since the pelvis is missing from individual II, sex estimation was based on the skull, which is fairly feminine in its diagnostic traits. Provisionally, it scores as a Probable Female.



Individual II, which is the north-facing individual, shows no signs of *cribra orbitalia* or of porotic hyperostosis. Out of 25 teeth present, no traces of LEH were found, but there was one case of caries. Surprisingly, given the young age of the individual, there were two cases of antemortem tooth loss (R and L P<sub>2</sub>). Taking into account the age of the individual, and the fact that the missing teeth are on the same position on either side of the mandible, it is possible that the use of these teeth as tools to process material may have played a role in their loss. Unsurprisingly (again, given the young age), neither of the joint systems were complete enough to investigate (elbow and knee) shows signs of OA. The individual also showed no traces of trauma.

Szarbia Zwierzyniecka: Grave 23/IX

This is a burial of an adult and a young child. The adult is given in the literature as being a male of age *senilis*, greater than 60 years old (Baczyńska, 1994; Haduch, 1997). Unfortunately, by the time of my examination, some items appear to have been moved or misplaced; the skull of the adult was missing and there were two os coxae from different adults. However, both os coxae had masculine traits, so this appears to be a secure estimation. Given the situation, I was unable to confidently assess the age of the individual, but it is certain that he was an adult. Based on tooth eruption and the degree of formation of the crowns of the permanent dentition, the subadult was approximately between 2 and 4 years of age, which generally agrees with the estimate of Haduch (3-4 years).

The adult male was laid on an E/W axis, generally on his right side, facing north. The child appears to have been cradled by the man. It is not clear on which side the child was

laid, but it seems that the head was next to the face of the man. A clay pot was placed below the feet of the man. There was also a faience bead near the ribs of the man (and presumably the neck of the child); it is unclear to whom this belonged. There were also fragments of what appears to have been a single boar-tusk pendant (Baczyńska, 1994).

Although the skull of the man was missing at the time of my analysis, four adult teeth were present, none of which showed signs of caries or LEH. Of the 13 vertebrae present, five (thoracic and lumbar) showed signs of OA, but no Schmorl's nodes. There were traces of slight OA in the shoulder, but not in any of the other major joint systems. The individual showed no signs of trauma. As for the child, the cranial vault was too poorly preserved to assess porotic hyperostosis, and no orbits were present to evaluate *cribra orbitalia*. No signs of caries or LEH were noted, and no traces of trauma were found.

#### Żerniki Górne: Grave 75

In grave 75 was a badly preserved skeleton, which appeared to have originally been laid with the head to the east and feet to the west. The literature (Kempisty, 1978) does not specify the side on which the individual was laid, but from the illustration, it appears to be the right side; therefore, they were probably facing north. This individual was certainly an adult, but not enough diagnostic fragments remained for me to make a confident age or sex estimation. However, in the literature, they are given as "...mężczyzn[a] (?) w wieku wczesny maturus..." (Kempisty 1978, p.141), or essentially, a Middle Adult male (with uncertainty as to the sex). There were also some bones present from a subadult (given in the literature as

early *infans I*), but not enough for me to accurately assess the age. An awl was found near the tibiae of the adult, and some manner of pendant was located near the chest.

Very little was available for pathological analysis, and none was found on either skeleton. The single tooth present from the subadult displayed neither caries nor LEH. Both the right ulna and the right radius of the adult were fractured at the distal end.

Furthermore, the fragments of these long bones that would be distal to the fracture itself are not present. The ulnar fracture appears to be perimortem, based on the margins and coloration of the fracture. It is more difficult to say with confidence the timing of the radial fracture, but it was certainly either perimortem or postmortem. Both fractures are complete, oblique fractures, and the ulnar fracture certainly appears to be intentional; it is neither in a location nor in a manner consistent with accidental or taphonomic breakage. The fracture appears to begin proximally on the posterior side of the ulna, and proceeds distally to the anterior side. The same is true on the radius.

### *Discussion*

In attempting to determine the significance of the north-facing burials, it is important to look for any patterns—for example, between sex and orientation, sex and grave goods, the range of ages, and the relative wealth of the graves as indexed by grave goods. Of the nine north-facing burials discussed above, it would seem that a wide range of ages is present, from very young children to Middle Adult and possibly Old Adult. Furthermore, grave endowments range from no grave goods to quite richly adorned individuals. This latter point makes one possible explanation for these fairly “atypical”

orientations far less likely: that is, the possibility that social pariahs were buried in such a manner. The individual in grave 37 at Szarbia, for example, could hardly be considered *persona non grata*, given the richness and variety of deposited grave goods. Neither are these individuals buried away from others or outside the main cemeteries. Another explanation that could be explored is that these individuals may be non-locals. Although this cannot be ruled out with the currently available evidence, the fact that—as discussed above—north-facing burials are not common practice in any of the contemporaneous archaeological cultures of Central Europe certainly precludes the notion of burying non-locals in the manner of their native traditions.

Looking at some of the patterns that do exist among these north-facing burials may shed some light on their potential significance. Among the nine individuals buried facing north, two are aligned W/E and seven are aligned E/W. Of those aligned W/E, one is a subadult and one is a female. As for those aligned E/W, one is a subadult, one is a male, one is, *provisionally*, a Probable Female (Szarbia, grave 26), and sex for the remaining four adults could not be confidently estimated. Furthermore, of the nine burials in question, three are confirmed double burials (Szarbia 26, Szarbia Zwierzyniecka 23/IX, Żerniki Górne 75), one was indicated to have contained some bones of a second, subadult individual by Haduch (1997; Szarbia Zwierzyniecka 3/III), and one may have been prepped for a double burial (Szarbia 35a). Interestingly, in all three of the confirmed double burials, plus the one possible double burial (Szarbia Zwierzyniecka 3/III), the north-facing individual was laid in the E/W – R orientation. Of those, two were given clearly “masculine” grave goods, and one was given an awl, which is found more frequently in W/E graves, although not to a statistically significant degree. The one individual of these that was not

given “masculine” grave goods is the one provisionally estimated to be a Probable Female (though, it should be noted that the individual is rather young). It is also important to consider that in all of the double burials that contain a north-facing individual, that individual is an adult, and the other individual is a subadult.

None of this data can point definitively to a conclusion as to the significance of north-facing burials, but some very interesting possibilities are raised. Firstly, taking into account the above, plus looking at the south-facing burials previously discussed, one notices that—at least at these three sites—we have one (and possibly two) male(s) buried in the prototypically “feminine” orientation (E/W – L; Szarbia Zwierzyniecka 5/V, and maybe 19/XI), but we have no females buried in the prototypically “masculine” orientation. The south-facing female that was discussed is buried E/W – L, but was given an arrowhead. The rest of the females discussed are north-facing: one is aligned W/E and was given some “masculine” grave goods, and two other *potentially* female individuals are buried E/W (though it should be considered that they may, in fact, be males).

Of course, this is purely speculative, but taken together, this data *could* suggest that males could live socially as females under certain circumstances, in a more complete way than females could live socially as males. Perhaps females who took on “masculine” roles in life were buried on their left sides so as to acknowledge their biological sex, but aligned W/E to signify their social functions. As for males, in addition to the possibility of living completely as gendered females, they may have been able to “transition” later in life—perhaps after their prime reproductive years or their martial usefulness—for example, in taking on the role of a caretaker. In fact, Jan Turek (2017) elaborates on the case of an elderly man from a Corded Ware cemetery in Bohemia who was buried in the manner

usually reserved for females, arguing that “...some aged men may have decided to ‘retire’ as women for symbolic and practical reasons” (Turek 2017, p.353).

It is intriguing that four of the six E/W aligned north-facing adult burials are double burials that include a subadult. In one of those (Szarbia 26), it seems likely that the two individuals could be siblings, since they are so young and so close in age (10-12 and 16-22). Perhaps the north-facing, older individual was a caretaker for their sibling. More puzzling are the two north-facing subadult burials. If the above speculation that females—regardless of age—could not *fully* live as social males is correct, the W/E aligned subadult burial (Szarbia 35a) may not be so anomalous, were the child shown to be female. The one subadult (8-12 years old) north-facing burial in an E/W alignment (Szarbia Zwierzyniecka 1/III) is more of a conundrum. However, the fact that many of the bones in this burial were secondarily displaced should also be considered.

### *Conclusion*

Given the plethora of historical and ethnographic data on gender variants in nearly all parts of the world, such phenomena should not be overlooked in prehistoric archaeology. The social nature of gender certainly makes it more difficult to “excavate” traces of it prior to the written record. However, those researching the Final Neolithic and Early Bronze Age in Central Europe are fortunate that burial orientations and grave goods are often so clearly imbued with significance relating to gender. This presents the opportunity for archaeologists, anthropologists, and bioarchaeologists to work together to try to piece together some of these clues about how people lived and died, in order to

provide solid evidence of gender constructs in the past, and thus avoid simply ignoring the topic altogether, or—on the other hand—merely offering pure “postmodern” speculation. Of course, we must always keep in mind that our present-day, culturally specific terms and constructs relating to gender and gender variants may not—and likely *did not*—apply identically in the distant past. Nonetheless, biological, behavioral, and cultural variation have always and will always exist in human societies, so we must resist foisting an *a priori* binary system of gender on prehistoric societies.

Much progress can be made in understanding gender in prehistoric societies by archaeologists, anthropologists, and bioarchaeologists. In the particular cases discussed in this paper, modern advances in ancient DNA technology can help to elucidate some of these questions. For example, we can look for evidence of the SRY gene to ascertain biological sex (though, admittedly, any intersex conditions would be more difficult to find). Furthermore, for the double burials, we may be able to determine, or at least narrow down, the type of familial relationship the individuals had, if any. Either way, this is a perfect time in the history of archaeology and bioarchaeology to begin to try to investigate some of these fascinating aspects of prehistoric societies.

## CHAPTER 5: Theorizing Gender and Power

*Research Objective #3: What was the relationship between gender and power in Mierzanowice Culture communities?*

In her description of the sex/gender system, Gayle Rubin (Rubin, 1975) notes that the system is not inherently inequitable, but is made so as the product of particular social systems. In other words, some form of power is necessary to continue the cycle of sex and gender reconstitution. Susan Kent (1999) notes that power is related to social stratification and that “in highly egalitarian societies...there is an underlying emphasis on social definitions of people, rather than hierarchical categories” (p.33). She recognizes that there is a whole spectrum between extremely egalitarian societies and highly stratified societies, and asserts that in more egalitarian societies there are multiple avenues to power in the sense of *power to*, but only in stratified societies is power turned into a commodity in the sense of *power over*. So, it would seem that rigid and unequal gender categories are produced primarily in societies that fall toward the “highly non-egalitarian” end of the spectrum. At the same time, Kent is clear that *difference* is not synonymous with *inequality*. The existence of a division of labor, for example, does not imply that one type of labor is necessarily more valued than another. The rigidity of the division of labor and the values attached to different roles are specific to the particular cultural system and are dependent on relations of power.

In other words, the answer to the third research objective is not simply to be found in examples of difference, but in particular kinds of difference—those produced by *gender*



*stratification*. Here, gender stratification (or gender hierarchy) is taken to signify “inequalities in power relationships between genders, evidenced by physical abuse, differential access to food, sex, wealth, political office, esoteric knowledge, or freedom of movement” (Hays-Gilpin & Whitley, 1998, p.xv). Given the assessment that communities of the MC, particularly in the Late Phase, seem to exhibit growing social stratification—though not to the degree of the neighboring Únětice and Otomani Cultures—it is reasonable to assume that some amount of gender stratification could be found. However, what form that might take and to what extent is less apparent at the outset.

Some of the inequalities listed in the definition of gender stratification given above are difficult to assess archaeologically (e.g., differential access to esoteric knowledge or freedom of movement—at least in the absence of isotope analysis), if not impossible (e.g., differential access to sex), but others are well within the realm of bioarchaeological analyses. For example, in the preceding chapters, differential access to food—or, put another way, unequal risk of nutritional or metabolic stress—was investigated through an analysis of rates of LEH in males and females. Although not explicitly listed in the definition above, differential risk of injury or disability due to divisions of labor can be argued to be an element of gender stratification. Chapters 2 and 3 addressed this through analyses of osteoarthritis, Schmorl’s nodes, and dental pathologies (to the extent that an increased rate of attrition can promote certain conditions).

One of the most visceral and obvious signs of a power differential, targeted violence or abuse, is discussed in the third and final article of this dissertation (Toussaint, n.d.), which investigates rates of trauma and interpersonal violence more generally. Patterns and characteristics of skeletal trauma among adult males and females are interpreted in the

context of forensic, ethnographic, and bioarchaeological data, and are broken down by age group. This approach can help to differentiate between injuries that are statistically more apt to be signs of accidental trauma versus those that are likely intentional. Thus, this final article deals with the relationship between gender and power in the most direct and detailed manner, but it is complimented by the data on nutritional, metabolic, and musculoskeletal stress provided in the preceding chapters.

## **CHAPTER 6: Gendered Patterns of Violence and Trauma in Mierzanowice Communities of the Early Bronze Age (Toussaint, n.d.)**

### *Abstract*

The Mierzanowice Culture (MC) belongs to the Early Bronze Age of Central Europe. Burials in MC cemeteries were flat inhumations, with males aligned west-to-east, and females aligned east-to-west. This study aimed to investigate whether patterns of trauma and violence in MC communities were as starkly gendered as burial configurations. In all, 64 adults were analyzed—38 males and 26 females—from four MC cemeteries in southeastern Poland. About 21.9% of individuals had at least one antemortem injury, and the same percent had at least one perimortem injury. In both cases, females had more overall trauma than males, though not significantly. The cranium was the most frequently affected skeletal element. The most striking disparity in trauma rates was in the Young Adult age category, with females suffering a disproportionately high rate of both antemortem and perimortem injuries compared to males. The distribution of trauma throughout the skeleton also differed, with males showing a more dispersed pattern, while for females, 50% of both antemortem and perimortem injuries were found on the cranium, and the rest of the antemortem injuries affected the left ulna and the ribs. Taken together, the age and spatial distribution, as well as the character of certain injuries, suggest that a greater proportion of trauma in females was the result of interpersonal violence. The possibility that the practice of captive taking may be connected with injuries sustained by certain individuals is also briefly discussed.

## *Introduction*

One of the great strengths of bioarchaeology lies in its ability to synthesize scientific and social-theoretical approaches in the analysis of human remains from archaeological sites. From this perspective, bioarchaeologists are able to appreciate human remains as artifacts of biocultural processes through which the lived experiences of individuals—who are both buffeted and buffered by environmental and cultural conditions—are literally embodied (Goodman et al., 1984; Sofaer, 2006). A combination of population-level analyses and osteobiographies can help to breathe life into past cultures and enable a greater understanding of their ideologies and praxis.

Accordingly, the goal of this research is to investigate gendered patterns of trauma in an Early Bronze Age population and what any such patterns can reveal about social life in this time and place. Both gender and risk for trauma (including interpersonal violence) are social facts, particular to a given society, and an analysis of the interaction of the two can help bioarchaeologists begin to see how they are connected to other strands in the Geertzian web of culture. The manner in which labor, sources of power and status, access to resources, and value or esteem more generally are divided between men and women (and others)—which is to say, the construction of gender—has a dialectical relationship with a number of variables, including subsistence strategy (Bonvillain, 1998; Martin & Voorhies, 1975; O’Kelly & Carney, 1986), competition and conflict (Bonvillain, 1998; Wilson & Daly, 1993), contact with other societies (Bonvillain, 1998; Rasmussen, 2005), historical circumstances (Bonvillain, 1998; Martin & Voorhies, 1975; O’Kelly & Carney,

1986), and ideology (Bonvillain, 1998; Nanda, 2014; Rasmussen, 2005). Similarly, risk of trauma, whether accidental, occupational, or from conflict, depends on factors such as age, divisions of labor, subsistence strategy, population size, resource availability, and socialization (Ember et al., 1997; Harrod et al., 2012; Schröder & Schmidt, 2001; Walker, 1997). The ways in which sex, age, mortuary context, and patterns of trauma intersect can therefore elucidate aspects of gender and social structure, and the results of such studies can provide independent lines of evidence to compare with hypotheses based on other archaeological data, as well as suggest new directions of inquiry regarding the character of social life in past societies.

### *Archaeological Background*

The individuals included in this study come from cemeteries of the Mierzanowice Culture (MC), an archaeological complex belonging to the Central European Early Bronze Age. At its largest extent, MC sites could be found from Moravia in the Czech Republic, to western Slovakia, throughout much of southern Poland, to parts of western Ukraine. Regionally, the MC shares certain features of material culture and burial customs with other northern Carpathian populations, namely the Nitra and Košťany groups of Slovakia, as well as the later Strzyżów Culture of eastern Poland. This sphere of interaction and influence around the northern portion of the Carpathian arc is known as the Circum-Carpathian Epi-Corded Culture Circle (ECC; (Kadrow & Machnik, 1997).

The MC lasted from approximately 2400/2300 – 1600 BCE, and has been divided into several phases based on settlement patterns, characteristics of material culture, and

burial features (Kadrow & Machnik, 1997; Włodarczak, 2017b). In general, the Proto-MC Phase (2400/2300 – 2200 BCE) seems to have developed out of a milieu of local adaptations of Corded Ware and Bell Beaker influences, and likely represents a relatively (though perhaps decreasingly) mobile way of life. A more sedentary pattern, and thus more substantial MC settlements and cemeteries begin to appear in the Early Phase (2200 – 2050 BCE), increasing in size in the Classic (2050 – 1950/1900 BCE) and Late (~1900/1800 – 1600 BCE) Phases. These larger settlements seem to have relied mainly on a mixture of agriculture—based on emmer, einkorn, and (later) spelt—and animal husbandry, with cattle, ovicaprids, and to a lesser extent pigs (Włodarczak, 2017a; Włodarczak, 2017b). Archaeological evidence from certain large sites suggests livestock were grazed in a radius of about 30 kilometers from the main settlement area, and sites likely corresponding to seasonal encampments have been found (Kadrow, 1994). Radiocarbon dating of features from larger, multi-phase settlements points to a hiatus in settlement there between the Classic and Late Phases. The Late Phase sees a return of settlement to some of the larger sites, a different organization of space within the sites, and a diversification of ceramic decoration, certain features of burials, and economic models—both regionally and intra-regionally (Włodarczak, 2017a).

However, one of the most durable, continuous features of burials in MC cemeteries is the gendered orientation of individuals in the grave pits (Włodarczak, 2017a). All individuals are usually buried on their sides, or on their backs with their legs and arms turned to one side (Włodarczak, 2017a; Włodarczak, 2017b). Males are typically buried with their heads to the west and their feet to the east, while females are in the opposite orientation. The faces of the majority of individuals are directed to the south, which means

that males are usually on their right sides and females are on their left sides (Bąbel, 2013a, 2013b; Baczyńska, 1994; Kadrow et al., 1992; Kadrow & Machnik, 1997; Włodarczak, 2017b, 2017c). There are, however, interesting deviations from this pattern, which should not be overlooked (Toussaint, 2019b). Gendered distributions of grave assemblages also exist, with weapons (arrowheads, battle axes) and certain types of tools being found almost exclusively in W/E burials, and needles, pins, and shell and faience beads being found more frequently in E/W burials (Baczyńska, 1994; Kadrow, 1994a; Kadrow & Machnik, 1997; Toussaint, 2019b). Although sex estimation for subadults is problematic, the distribution of burial orientations and grave goods seems to follow the same pattern (Kadrow, 1994).

### *Material and Methods*

#### Archaeological sites and samples

Individuals included in this analysis come from cemeteries at four archaeological sites in southeastern Poland (see **Figure 1** in chapter 1): Szarbia (Koniusza commune, Lesser Poland province), Szarbia Zwierzyniecka (Skalbmierz commune, Świętokrzyskie province), Żerniki Górne (Busko-Zdrój commune, Świętokrzyskie province), and Kichary Nowe (current name of village: Nowe Kichary, Dwikozy commune, Świętokrzyskie province). The cemetery at Szarbia (Koniusza commune) was excavated in the summer of 2000 by Barbara Baczyńska. In total, 45 individuals were excavated, with most graves dating to the Late Phase of the MC (Baczyńska, 2000b). Szarbia Zwierzyniecka (Skalbmierz commune) was also excavated by Baczyńska between 1980 and 1985. Most excavated

features were from the cemetery, though some settlement features were uncovered as well. In total, 82 burials with 93 individuals were found in the process of excavating the endangered portion of the cemetery, but it was estimated that the entire expanse of the cemetery may have contained as many as 540 graves (Baczyńska, 1994). The vast majority of graves are linked with the MC, and among those, about 6% correspond to the Classic Phase with the remainder belonging to the Late Phase (ibid.). Anthropological analyses of the individuals from Szarbia Zwierzyniecka were carried out previously by Elżbieta Haduch (1997), focusing mainly on sex and age estimation and cranial morphology, but also including some information on trauma and pathologies. However, all individuals were reanalyzed for this study by the author. The cemetery at Żerniki Górne was excavated by Andrzej Kempisty between 1965 and 1968, and included burials from several archaeological cultures between the Final Neolithic and the Middle Bronze Age: Corded Ware, Bell Beaker, Mierzanowice, and Trzciniec (Kempisty, 1978). A total of 39 individuals from the Mierzanowice Culture were excavated, dating from the Early Phase to (possibly) the Late Phase (Włodarczak, pers. comm.). The last site used in this analysis is from the cemetery at Kichary Nowe, which has undergone successive stages of excavation since 1987 by Hanna Kowalewska-Marszałek. Burials dating from the Middle Neolithic to the Early Bronze Age have been discovered at the cemetery, but the majority (over 40 burials) are attributed to the MC. Based on <sup>14</sup>C dates obtained, as well as the grave assemblages, Mierzanowice Culture burials correspond to the Classic and Late Phases (Kowalewska-Marszałek & Duday, 2014).

For the purposes of this analysis, only individuals for whom sex could be reliably established were included, thus neither subadults nor those for whom diagnostic skeletal



elements were not available or were inconclusive are a part of the data set. In total, 64 individuals were included in the analysis, including 38 males/probable males and 26 females/probable females. This data set includes 10 individuals from Szarbia (Koniusza commune), 31 from Szarbia Zwierzyniecka, 18 from Żerniki Górne, and five from Kichary Nowe.

## Methods

Due to variation in the state and completeness of preservation of the remains, the morphology and degree of development of diagnostic skeletal elements, and differing rates of accuracy of techniques, several different methods were used in the sex and age estimation of the individuals. For sex estimation, observational methods using the pelvis and the skull were used as described in the “Standards for Data Collection from Human Skeleton Remains” (Buikstra & Ubelaker, 1994), including diagnostic characteristics of the ischiopubic region per Phenice (1969). In cases in which all diagnostic elements of the pelvis and skull were not available, or where there was uncertainty in scoring, the methods of Bruzek (2002) were used on the pelvis for clarification. A composite score was computed from all diagnostic elements and methods used, and sex was estimated based on this score. Greater weight was given to data from the pelvic region where available.

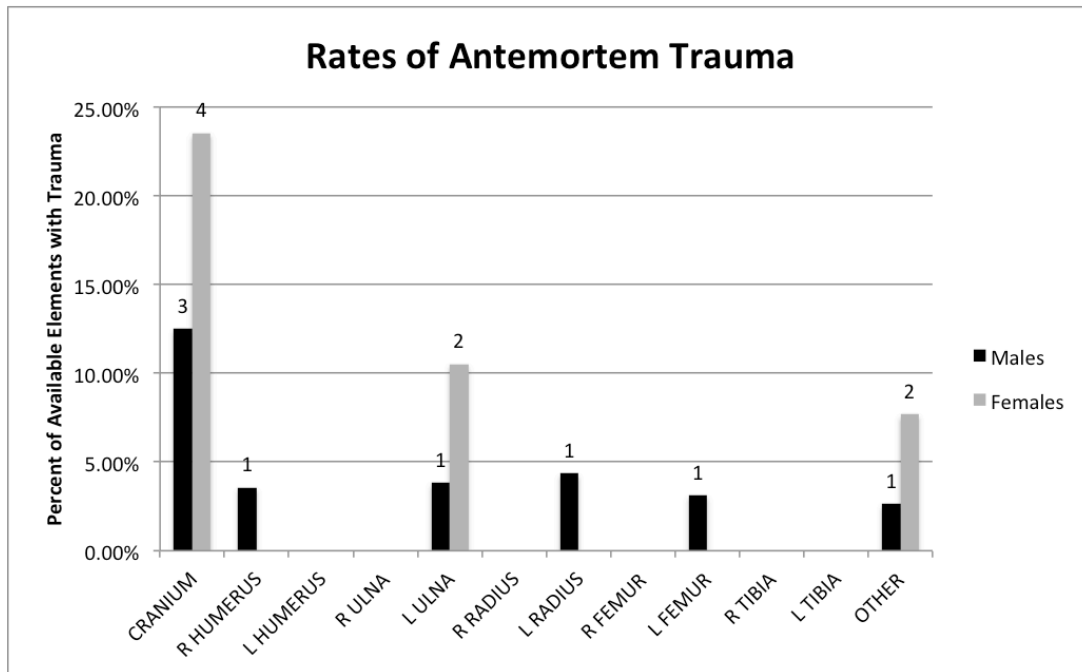
Age estimation was carried out using methods for the pelvis (Brooks & Suchey, 1990; Lovejoy et al., 1985; Todd, 1920, 1921), epiphyseal fusion (Buikstra & Ubelaker, 1994; McKern & Stewart, 1957; Scheuer & Black, 2000), ectocranial suture closure (Meindl & Lovejoy, 1985), and tooth development (Anderson et al., 1976; Gustafson & Koch, 1974;

Mincer et al., 1993; Ubelaker, 1989). Where none of these methods was sufficient or possible, or in borderline cases where age estimation needed additional data, tooth wear was used (Lovejoy, 1985). Again, a composite of individual results was used to determine the appropriate age group of the individual. Definition of age groups followed the recommendations of Buikstra and Ubelaker (1994:36)—Young Adult (20-34 years); Middle Adult (35-49 years); Old Adult (50+ years).

Trauma was identified and categorized by interval (antemortem, perimortem, postmortem) largely following information presented in Wedel and Galloway (2014). Additional clarification was provided with reference to White (1992) and from discussions in Stojanowski and colleagues (2016).

### *Results*

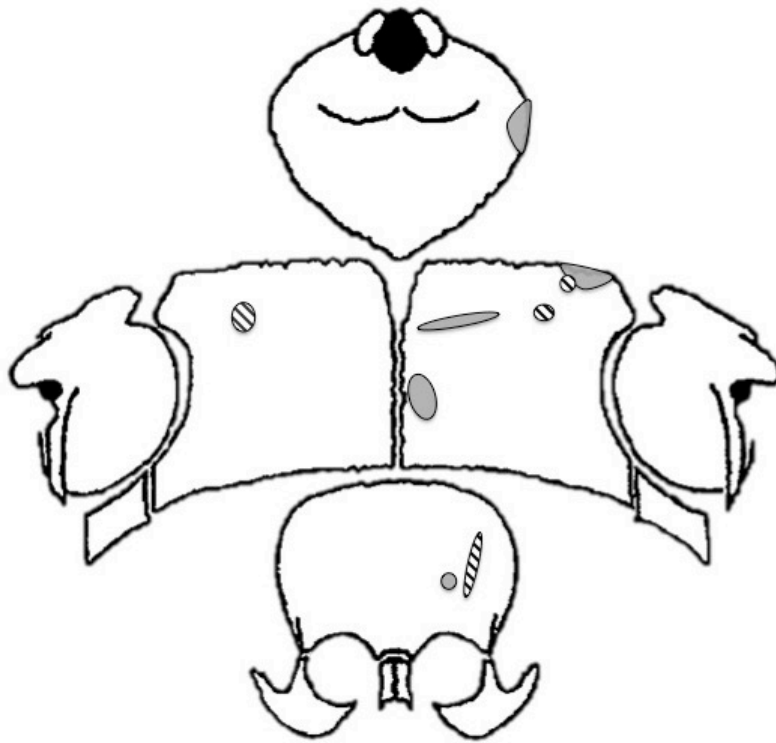
Out of 64 individuals included in the analysis, 14 (21.9%) have at least one antemortem injury. The most commonly affected skeletal elements are the cranium (7 out of 41 present crania; 17.1%) and the left ulna (3 out of 45 present; 6.7%). Of the 14 individuals with antemortem injuries, 11 (78.6%) have one instance and 3 (21.4%) have two instances. As for perimortem injuries, 14 of 64 individuals (21.9%) have at least one, with the cranium again being the most commonly affected region (7 out of 41 present crania; 17.1%), followed by the left femur (3/53; 5.7%) and the left humerus (2/42; 4.8%). Of the 13 individuals with perimortem injuries, 5 individuals (38.5%) have two or more such injuries. Three out of 64 total individuals (4.7%) have both antemortem and perimortem injuries.



**Figure 14:** Rates of antemortem trauma per skeletal element by estimated sex.

When breaking down the data by sex (**Figure 14**), males and probable males were treated as one group (“males”) and females and probable females were also treated together (“females”). Seven out of 38 (18.4%) males had at least one antemortem injury, compared to 7 out of 26 (26.9%) females ( $p = 0.5407$ ; Fisher’s Exact Test). As mentioned above, the cranium and the left ulna were the most frequently affected skeletal elements. Four of 17 female crania (23.5%) had antemortem injuries in the form of cranial depression fractures, compared to 3 out of 24 (12.5%) male crania ( $p = 0.4215$ ; Fisher’s Exact Test). Two of 19 females with left ulnae (10.5%) had antemortem injuries on that element, versus 1 out of 26 (3.8%) males ( $p = 0.5648$ ; FET). Out of the 7 females with antemortem injuries, 1 individual had two such injuries (14.3%) versus 2 out of 7 (28.6%)

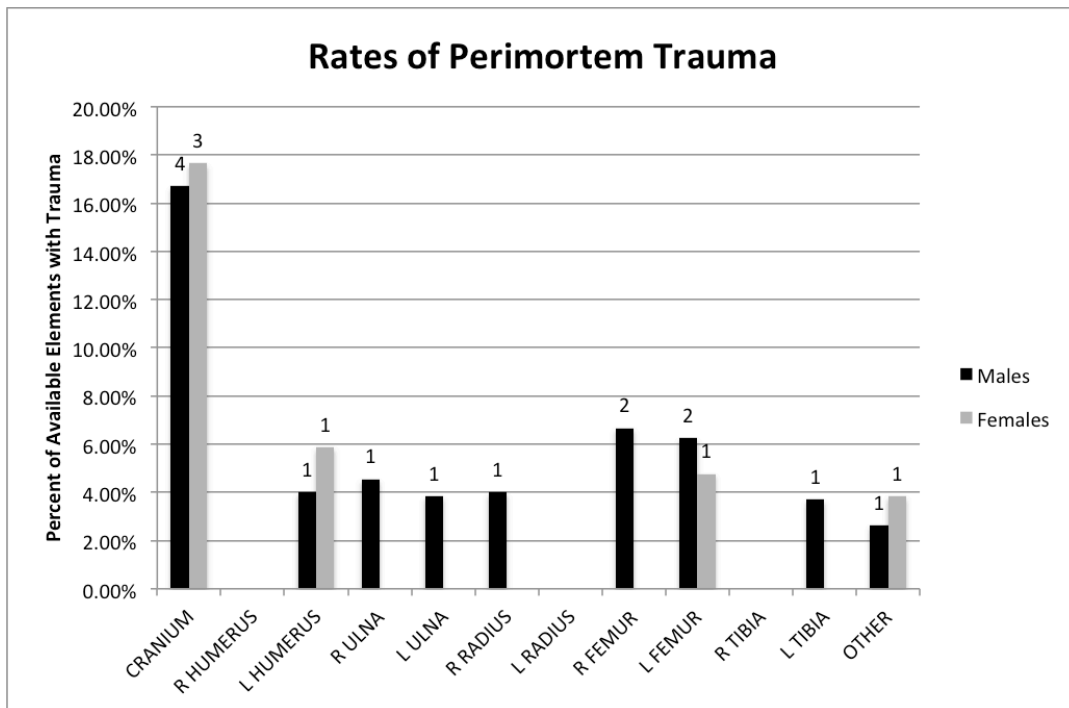
males ( $p = 1$ ; FET). The spatial distribution of healed cranial depression fractures is shown in **Figure 15**.



**Figure 15:** Spatial distribution of healed cranial depression fractures. Gray = females; hatched = males.

As for perimortem trauma (**Figure 16**), the overall rate for males was 8/38 (21.1%) versus 6/26 (23.1%) for females ( $p = 1$ ; FET). The cranium, left femur, and left humerus were the most affected skeletal elements. Out of 17 present female crania, 3 showed signs of perimortem fractures (17.6%) compared to 4 out of 24 (16.7%) male crania ( $p = 1$ ; FET). On the left femur, 1/21 (4.8%) females displayed perimortem trauma versus 2/32 (6.3%)

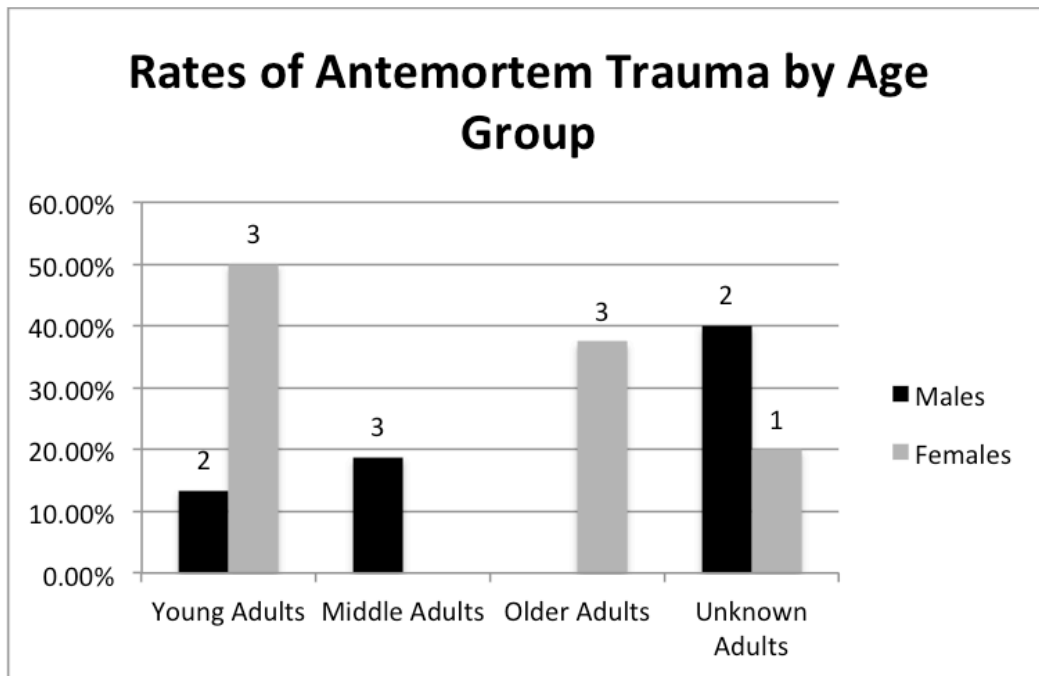
males ( $p = 1$ ; FET). For females, 1/17 humeri (5.9%) had perimortem injuries compared to 1/25 (4.0%) males ( $p = 1$ ; FET). Of the individuals with perimortem injuries, 3/8 (37.5%) males had multiple such injuries, as well as 2/6 (33.3%) females ( $p = 1$ ; FET). Among individuals with perimortem cranial fractures, one of the males had multiple such fractures (1/4; 25.0%), whereas 2/3 (66.7%) females had two or more ( $p = 0.4857$ ; FET). Of all the males included in this study, one of them had both antemortem and perimortem skeletal trauma (1/38; 2.6%), while 2/26 (7.7%) females had both types ( $p = 0.5613$ ; FET).



**Figure 16:** Rates of perimortem trauma per skeletal element by estimated sex.

Patterns of trauma in males versus females were also analyzed with respect to age group. The age distributions of males and females in the sample (of those who could be

placed into a specific age group) are significantly different ( $\chi^2 = 8.744$ ;  $p = 0.012626$ ). A larger proportion of females (8/26 vs. males: 2/38) is in the Older Adults age category, whereas males make up a greater amount, both absolutely and proportionally, in the Young (15/38 vs. females: 6/26) and Middle Adult (16/38 vs. females: 7/26) categories. Five out of 38 male adults and 5 out of 26 female adults could not be assigned to a definitive age category.

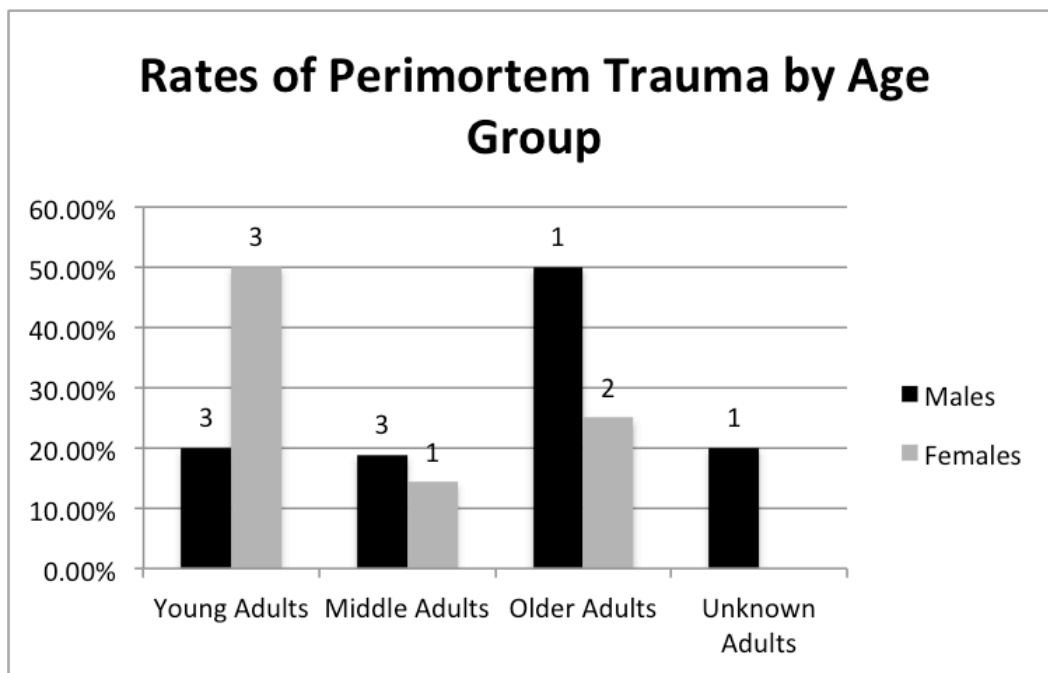


**Figure 17:** Overall rates of antemortem trauma by age group for males and females.

The rate of antemortem trauma by age group is shown in **Figure 17**. The greatest difference between males and females is in the Young Adult age category, where 3/6 (50.0%) females have antemortem injuries, compared to 2/15 (13.3%) males ( $p = 0.1146$ ; FET). In the Middle Adult age group, 3/16 (18.8%) males have antemortem injuries, but

none of the 7 females do ( $p = 0.5257$ ; FET). Among Older Adults, 3/8 (37.5%) females have antemortem trauma, compared with 0/2 males ( $p = 1$ ; FET).

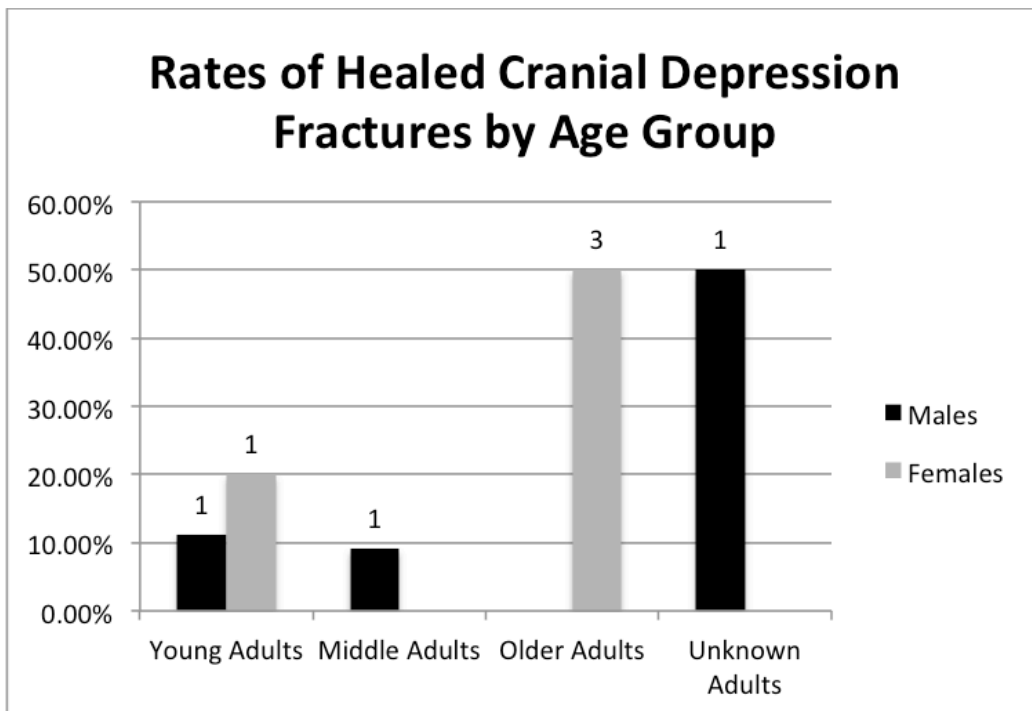
The distribution of perimortem trauma by sex and age group is shown in **Figure 18**. Again, the largest difference occurs in the Young Adult age group. Among these individuals, 3/6 (50.0%) females have perimortem trauma versus 3/15 (20.0%) males ( $p = 0.2906$ ; FET). In the Middle Adult age category, 3/16 (18.8%) males and 1/7 (14.3%) females are affected ( $p = 1$ ; FET). Among Older Adults, 1/2 (50.0%) males and 2/8 (25.0%) females display perimortem injuries ( $p = 0.5333$ ; FET).



**Figure 18:** Overall rates of perimortem trauma by age group for males and females.

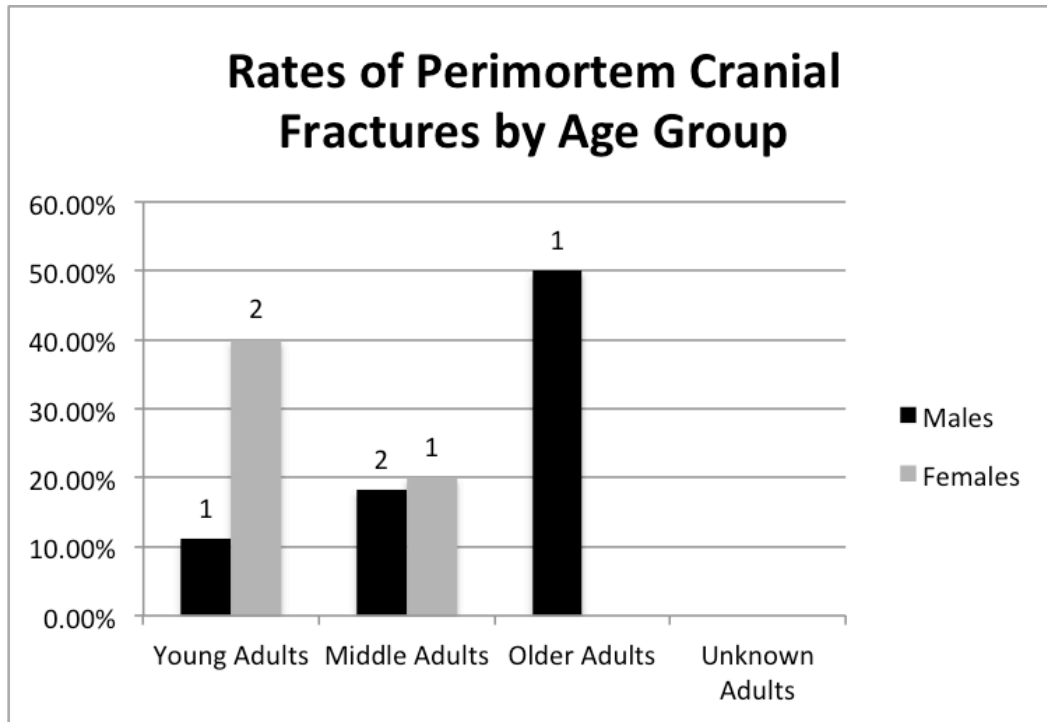
Age distributions of perimortem and antemortem cranial trauma (in the form of healed cranial depression fractures) were also analyzed more specifically. **Figure 19** shows

the rates of healed cranial depression fractures by age and sex. The greatest difference in male versus female rates is in the Older Adult age group, in which 3 out of 6 preserved female crania (50.0%) and none of the 2 preserved male crania are affected ( $p = 0.4643$ ; FET). The rate of healed cranial depression fractures among Older Adult females is the highest of any age category for both sexes. The distribution of perimortem cranial fractures by age and sex (**Figure 20**) is almost the reverse. In this case, the highest rate of such trauma for females is in the Young Adult group, where 2/5 (40.0%) preserved female crania and 1/9 (11.1%) preserved male crania are affected ( $p = 0.5055$ ; FET). However, the highest rate of perimortem cranial trauma for males is in the Older Adult group, where 1/2 (50.0%) males versus 0/6 females display trauma ( $p = 0.25$ ; FET).



**Figure 19:** Overall rates of healed cranial depression fractures by age group for males and females.





**Figure 20:** Overall rates of perimortem cranial fractures by age group for males and females.

### *Discussion*

Although sample sizes are relatively small and, perhaps partially as a consequence of that, most results do not reach statistical significance, some gendered patterns of trauma are apparent. Firstly, females have higher overall rates of both antemortem and perimortem trauma than males (albeit, the difference is slight for perimortem trauma), and the distributions of trauma by skeletal element differ between the sexes. Both perimortem and antemortem trauma are more dispersed among skeletal elements for males. This is particularly noticeable for antemortem trauma, which for females is found only on the

cranium, the left ulna, and on rib fragments (counted within the “Other” category in **Figure 14**).

Healed cranial trauma is a particularly valuable tool for bioarchaeologists studying patterns of interpersonal violence. One reason is simply that identifying healed trauma can be done more confidently in many cases than identifying perimortem trauma, due to taphonomic complications and the ambiguous nature of the perimortem interval—particularly in consideration of postmortem rituals (Walker, 1997). Additionally, many forensic studies of both intimate partner violence and interpersonal violence more generally cite the head and face as being particularly targeted, and more frequently injured than by accidents (Allen et al., 2007; Bhandari et al., 2006; Crandall et al., 2004; Petridou, 2002; McNulty, 2016).

Because of the difficulties inherent in determining with certainty whether a skeletal injury was caused intentionally or by accident, bioarchaeologists must interpret them in the context of other data, such as location on the skeleton, morphology, comorbidities, and mortuary configuration (Martin & Harrod, 2015). With regard to cranial trauma, some studies have found injuries above the so-called hat brim line are more likely to be the result of a direct blow to the head as opposed to a fall (Guyomarc’h et al., 2010; Kremer et al., 2008). The same studies also indicate that injuries to the left side of the skull are associated with blows, while falls more often than not affect the right side.

Relevant context for each individual with at least one healed cranial depression fracture (CDF) is shown in **Table 9**, and the patterning of CDFs on the skull is shown in **Figure 15**. Of the males, 2 of 3 (66.7%) with CDFs have injuries above the hat brim line, compared to 3 of 4 (75%) females. Of those with CDFs above the hat brim line, if for the

moment an assault by a right-handed attacker is assumed, one male would have been struck twice (number of occasions unknown) in a frontal assault, and the other would have been struck from behind; it is interesting to note that the latter was buried in a settlement pit. Under the same assumptions, one female would have been struck in a frontal assault, and one would have been struck from above. The third female with an injury above the hat brim line has a CDF on the posterosuperior portion of the left parietal. It is difficult to say with certainty the position of the hypothetical attacker, but an assault from above seems the most plausible. Four of the 7 (57.1%) individuals with CDFs were buried in settlement pits rather than proper graves, compared to 5 of the entire sample of 64 (7.8%) individuals ( $p = 0.0038$ ; FET).

Furthermore, 4 of the 7 individuals with CDFs have additional skeletal trauma—either antemortem injuries or postmortem modifications of the foramen magnum (likely within the perimortem interval). Modification of the foramen magnum in these cases usually seems to take the form of widening or lengthening the opening through a combination, perhaps, of drilling, scraping, and/or cutting. Similar cases are known bioarchaeologically from Nasca trophy heads, mortuary ritual in Papua New Guinea, and a variety of archaeological and ethnographic occurrences throughout Europe, Asia, and Oceania (Forgey & Williams, 2005; Haduch, 1997; Kiszely, 1970; Stodder, 2005).

Explanations have ranged from removal of the brain (for cannibalism or as part of preparing the dead for burial), to modifying the skull for display (e.g., on a pole)—as a war trophy or the venerated relic of an ancestor, to acquiring part of the skull as an amulet or for use in apotropaic magic. Modification of the foramen magnum is relatively rare in this population; of the 178 burials analyzed from the four sites included in this analysis, only 9

individuals (5.1%) bear such traces. Thus, this practice does not appear to be linked to a typical manner of preparing the dead for burial. Moreover, 6 of these 9 (66.7%) were buried in settlement pits. The adults were all female (5), except for one male (buried in a pit) and one individual of indeterminate sex (buried in typical female manner). Individuals not buried in a settlement pit were buried in graves in the female position. Since most of the cases of foramen magnum manipulation coincide with individuals buried in a pit and/or with cranial trauma, it seems likely that this procedure was associated with those who were “other” or “less than” in some way.

Aside from the cranium, traces of antemortem trauma on females were confined to the left ulna and the ribs. Two of the 19 left ulnae present from females (10.53%) had healed fractures, compared with 1 of 26 (3.85%) from males ( $p = 0.5648$ ; FET). Rib fractures were only found on female individuals (2/26 individuals; 7.7%). As for rib fractures, forensic studies are mixed in their assessment of the most likely etiologies; some mention that injuries to the chest, torso, or abdomen are frequently seen in cases of domestic violence (Allen et al., 2007; Crandall et al., 2004; Spedding et al., 1999), but it has also been stated that rib fractures occur more often than expected in accidental injuries (McNulty, 2016). It has also been found that long bones and extremities tend to be injured more frequently in accidents—particularly the lower limbs (Allen et al., 2007; Crandall et al., 2004; Petridou, 2002; McNulty, 2016). Some authors, however, have found that injuries to the upper extremities are common in cases of intimate partner violence against women (Crandall et al., 2004; Spedding et al., 1999). This may be connected to the tendency to raise the arm to defend against attacks, exposing the ulna when the forearm is pronated or in a neutral position.

Grave	Sex	Location	Side	Age	Other Injuries	Burial Type	Grave Goods	Archaeological Ref.
S51	Male	above HBL	left (x2)	Middle Adult	none	grave	yes	Baczyńska 2000
SZ24/VII	Male	above HBL	right	Unknown Adult	none	pit	no	Baczyńska 1994
KN50	Female	above HBL	top	Older Adult	FM modification	grave	yes	Kowalewska-Marszałek (pers. comm.)
SZ11/VIII	Female	above HBL	left or top	Older Adult	FM modification, AM rib frac	pit	few	Baczyńska 1994
SZ1W/XV	Female	above HBL	left	Young Adult	FM modification	Other (prob. pit)	none	Baczyńska 1994
SZ1/V	Male	in HBL	left	Young Adult	FM modification, AM femur frac	pit	none	Baczyńska 1994
KN47	Female	in HBL	left	Older Adult	none	grave	few	Kowalewska-Marszałek (pers. comm.)

**Table 9:** Relevant context for each individual with at least one healed cranial depression fracture, including the location and side of the injury/injuries on the cranium and other archaeological information. HBL = hat brim line; FM = foramen magnum.

Such injuries are classified as “parry” fractures when they affect the distal third of the ulna, the fracture line is transverse or slightly oblique, and (usually) the radius is uninvolved (Judd, 2008; Wedel & Galloway, 2014). Judd (2008:1665) additionally adds that the healed fracture should be in only slight horizontal apposition or unalignment. She also cautions that healed stress fractures of the ulna can mimic parry fractures, but are usually in full alignment. Because it is possible to have a distal ulnar fracture without a violent etiology, Martin and Harrod (2015) suggest that a parry fracture in conjunction with evidence of a cranial depression fracture or a comminuted fracture would put the inference of interpersonal violence on more solid footing. In all three individuals with healed left ulna fractures, the injuries are in the distal third of the shaft, and the left radii are present and uninjured. Although the fracture lines are not visible to the naked eye, the distal fragments do all appear to be in slight horizontal apposition. None of the three individuals has a CDF, but two of them (one male, one female) have perimortem cranial fractures.

Both antemortem and perimortem trauma shows a more diffuse pattern for males, affecting long bones in particular more often than females. As reported above, many forensic studies indicate that long bone fractures, and in particular those of the lower extremities, are more often the result of accidental, rather than intentional trauma. A reasonable, though provisional, conclusion would be that males in Mierzanowice populations encountered more accidental or occupational trauma, perhaps based on a gendered division of labor.

Nonetheless, perimortem cranial trauma is common for both males and females in this sample, accounting for 4/14 perimortem injuries (not counting multiple cranial fractures on the same individual) for males (28.6%) and 3/6 injuries (50.0%) for females

( $p = 0.6126$ ; FET). Given the location (above the hat brim line), fracture pattern (stellate, concentric, Le Fort), and manner (possible decapitation: one male, one female) of these injuries, it is fairly safe to assume that they were the result of interpersonal violence.

Other probable perimortem injuries due to assault include chop marks on a right fibula (male) and an un-sided metacarpal (female). One male also has complete fractures on both his right ulna and right radius, the patterns of which suggest the arm was hit with a direct blow while the individual was bracing himself on the ground. Another male has a midshaft fracture of the left ulna without involvement of the radius.

In addition to the information gleaned from the distribution of trauma throughout the skeleton, much insight can also be gained from an investigation of rates of trauma across the life course. Looking at the rates of antemortem trauma by age group (**Figure 17**), it appears that frequencies go down for females with increasing age, while they go up for males. One would expect that the higher the age of death of the individual, the more healed traumas their skeletons would record, on average. This seems to be the pattern for males, though, again, sample sizes are small; and, while there are no males in the Older Adult category with antemortem trauma, only two males were found to be in this age category. For females, rates of antemortem trauma are highest in the Young Adult age category (50%), they drop to zero in the Middle Adult age category, and rise again to 37.5% in the Older Adult category. As the difference in frequency between Young Adults and Middle Adults approaches statistical significance ( $p = 0.0699$ ; FET), it is unlikely that this is due purely to sampling. Before offering a possible interpretation, it is instructive to compare with other age-based graphs.

Turning to rates of healed CDFs, they seem to increase with age group for females—except for the drop-off in the Middle Adult age group—while the rates largely stay fairly constant for males (**Figure 19**). This pattern is most strikingly different when compared to overall rates of antemortem trauma for females by age group. Healed CDFs follow more closely the pattern that would be expected, in which healed trauma accrues over time. A look at rates of overall perimortem trauma and perimortem cranial fractures may help to clarify the discrepancy between antemortem trauma and healed CDFs for females. In both **Figure 18** and **Figure 20**, it is apparent that rates of perimortem trauma, including cranial trauma, are highest for females in the Young Adult age group, and quite a bit lower in the Middle and Older Adult groups. For males, the rates remain approximately constant or increase slightly with each subsequent age group.

Taken together, this all seems to suggest that males experience a fairly consistent risk of trauma over the life course, while for females, this risk peaks in young adulthood. One proximal explanation for the difference in trend between overall antemortem trauma and healed CDFs for females is that females who were at higher risk for trauma as young adults were more apt to succumb—either from trauma or disease—before reaching middle adulthood; and in addition, cranial trauma may have been more likely to be fatal in this age group than in older age groups. This seems to be borne out by **Figures 18** and **20**, and by the fact that the only two females to have both antemortem and perimortem skeletal trauma were young adults (the lone male was a Middle Adult). It would appear that females were more likely than males to survive through middle adulthood, and indeed, the proportion of females in the Older Adult category (38.1%) is significantly higher than that of males (6.1%) in the same group ( $p = 0.0088$ ; FET). Thus, any antemortem injuries



sustained by females in middle adulthood would have been seen in individuals who died in older adulthood.

Although caution should be exercised when comparing any two societies with different economic and cultural models, let alone those separated by millennia, a better understanding of these results may come from placing them in the context of systematically researched studies in the modern literature on violence. Many studies have found that risk of interpersonal violence is highest among those between their teens and thirties—that is to say, those in their reproductive years (e.g., Allen et al., 2007; Apel et al., 2013; Bhandari et al., 2006; McNulty, 2016). Furthermore, although accidents are also most frequent in younger age groups (Allen et al., 2007), interpersonal violence is more common than accidental injury during these years, and is overtaken by accidental trauma only around the time of middle adulthood (Allen et al., 2007; Crandall et al., 2004). The highest risk of intimate partner violence for females is also in their reproductive prime (Bhandari et al., 2006), and according to one study comparing abuse to accidental trauma, “Injuries reported by women aged 30-39 were more than twice as likely to be due to IPV than to unintentional injury...” (Petridou, 2002, p.198).

### *Conclusion*

The results of this study suggest that while both males and females in MC communities suffered fairly similar rates of antemortem and perimortem trauma, a greater proportion of female trauma appears to be intentional in nature. Furthermore, it peaks in young adulthood. Though there can be discrepancies between idealized, symbolic cultural

representations and daily life, males in Mierzanowice cemeteries are much more frequently bestowed weapons as grave goods than females. Combined with the fact that the female age distribution skews older than the male distribution, it would seem unlikely that participation in raiding or group conflict is responsible for female trauma rates.



**Figure 21:** Cranial fractures and healed parry fracture of the left ulna on a young adult female from Szarbia Zwierzyniecka (grave 11/I). Photos by Mark Toussaint.

It is, of course, unclear who the perpetrators of interpersonal violence against females were. At least one ethnoarchaeological study has demonstrated that in polygynous societies, conflict between cowives should not be overlooked (Harrod et al.,

2012). We do not know the family structure of MC societies, so this cannot be ruled out as a contributor to female injuries. However, the peak of trauma in prime reproductive age may point toward males as assailants. In explaining one of the gender asymmetries in their study of interpersonal violence, Apel and colleagues (2013, p.586) cite “...research on the control motive in intimate relationships, in which males use injury (or the credible threat thereof) as a way to coerce their partners.”

One other possible explanation for certain cases of interpersonal violence against females is captive taking. At least two females from this sample seem to make compelling candidates for captives (**Figure 21**)—buried in settlement pits, with multiple injuries, one of whom, according to Haduch (1997, p.104), differs from the rest of the population of the cemetery in cranial metrics.

In conclusion, bioarchaeological studies of violence can help to elucidate the inner workings of past societies, and can provide invaluable information on possible gender stratification. However, it is important that bioarchaeologists take into account life history, mortuary and archaeological context, ethnographic and modern forensic studies, and social theory when conducting such studies. Only in this way can a fuller, more nuanced, less biased picture develop.

## CHAPTER 7: Conclusion

The research objectives laid out for this dissertation were admittedly quite theoretical and ambitious. This was not without reason. For, although no single analysis could satisfactorily answer any of the main questions, the goal was less to end up with unambiguous results than to reveal the complexity inherent in the manifestation of gender in the archaeological record and in the dialectic interplay between the social and the biological. Moreover, ambitious questions are a necessary impetus to push forward bioarchaeological theory and methods. This dissertation was an attempt to heed the call of scholars like Pamela Geller to move beyond presentist assumptions and *a priori* binary framing. While there are no easy answers, the results presented in the previous three articles, together with careful theoretical and contextual analysis, have begun to paint a picture that elucidates important aspects of the research objectives and shines a light on the path forward for future research.

*Research Objective #1: What was the relationship between sex and gender in Mierzanowice Culture communities?*

The second article in this dissertation (Toussaint, 2019b) went the furthest in answering this question. It describes 11 individuals buried in atypical orientations, and one with an unusual combination of orientation and grave offering. This is a minority of the complete data set of 178 individuals examined for this work (~6.7%). While there is much variation to be found in the exact configurations of the remaining burials, it is clear that the

majority of individuals for whom sex could be estimated conform to the typical orientations: males aligned west-to-east and on their right sides, females aligned east-to-west and on their left sides. The content of the graves conforming to these two orientations tells us more about these groups are conceptualized. There are some patterns as to the kinds of grave goods associated with each burial orientation. Badge ornaments made of copper or bone, boar tusk pendants, and axes were associated solely with west-east burials (out of the two primary orientations), while only needles were associated exclusively with east-west burials. Although flint flakes and arrowheads were found significantly more often in west-east burials, and pins, shell beads, and faience beads were found more often in east-west burials, none of these were exclusive to one orientation—nor were the majority of categories of grave goods analyzed. The most common types of grave goods were generally those that could be found in burials of either orientation. Moreover, the ones that were exclusive to one or the other orientation were actually quite rare. Thus, while at first glance, one may be tempted to summarize the west-east, “masculine” ethos as being connected with warfare or hunting or protection, and the east-west, “feminine” character as being associated with adornment or decoration, such an assessment misses the large degree of variation in grave goods in both orientations, and the fluidity between them.

Nor was gender strictly born of or married to sex. Some of the aforementioned items that were either exclusively or significantly associated with “masculine” burial orientations could be found with females and vice versa. Furthermore, we find two males buried in the “feminine” burial orientation. However, this points to one way in which the possibilities of gender are structured by sex. While there are these examples of males buried in feminine orientations, we find no examples of females buried in masculine orientations at the three

cemeteries included in this analysis. So, perhaps females were in some way more constrained in the ways that they could perform gender.

As for idealized representations of power or wealth, there does not appear to be a strong distinction between masculine and feminine orientations. There are both quite richly and quite poorly provisioned graves in both orientations. Most, if not all burials are flat graves. With regard to symbols of power, it is difficult to say what those might be without making just-so assumptions. For example, is an arrowhead more a symbol of power than a necklace of faience beads? If anything, different grave goods may symbolize different kinds of power, for if a weapon shows power over life and death, a rare, prestige item shows power over social relations.

*Research Objective #2: Did non-binary gender categories exist in Mierzanowice Culture communities? What did each gender category mean in both an “idealized” sense and in practice?*

The question of whether non-binary gender categories (or gender variants) existed in MC communities is a difficult—if not impossible—one to answer definitively. However, the atypical burials discussed in the second article (Toussaint, 2019b) offer some tantalizing clues. The north-facing burials investigated seem often to mix gender metaphors. The combination of the axis of the body and the side on which the deceased is laid is a case in point. In these examples, west-east aligned burials (masculine axis) are placed on their left sides (feminine side), and east-west aligned burials (feminine axis) are placed on their right sides (masculine side). Furthermore, in many such burials, the grave

goods include both those of a more strongly masculine character and those of a feminine character. These examples are all within the cemetery, as opposed to the settlement, and some are quite well provisioned. They do not appear to be pariahs, nor are they buried in a manner typical of exogenous cultural traditions. Additionally, on the whole, the group of atypical burials does not seem to be in poor health relative to the rest of the sample.

As discussed in the article, the male who is north facing is buried on an east-west axis, lying on his right side. Three, and maybe four, of these east-west-right individuals—including the aforementioned male—were placed in double burials with a subadult. Although sex could not be confidently estimated for most of these individuals, it raises the possibility that males could transition, perhaps at an older age, from their previous roles to that of a primary caretaker. Although the single male in such an orientation was not able to be placed in a specific age category due to lack of diagnostic elements, he did have extensive OA of the vertebrae, as well as shoulder OA, which would indicate that more likely than not he was either in the Middle or Older Adult category.

It is also interesting to note that there are two subadults who are north-facing, and are not in a double burial. This is further evidence that subadults are gendered as well as adults, and are buried in the same range of orientations as the rest of the population. Taken together, the available mortuary data suggest that gender was not a static quality in MC communities, but one that could shift and take on new meanings throughout the life course.

Unfortunately, the enthesal data that was intended to help clarify potential gender categories though an investigation of divisions of labor was too incomplete to achieve clear results. This was a result of both the poor preservation of many specimens (and, thus, missing data) as well as—most likely—the many diverse variables that contribute to the

development of enthesal robusticity. After all, no individual is repeatedly performing only one set of motions or only one type of labor.

*Research Objective #3: What was the relationship between gender and power in Mierzanowice Culture communities?*

As mentioned in chapter 5, power can take many forms. Physical power over other individuals is perhaps the most obvious, but it still is only one manifestation of power. Control over resources and possibilities are other types of power. The third article (chapter 6) in this dissertation goes into depth about patterns of trauma, including the inference of interpersonal violence, and possibly abuse or intimate partner violence. Although both males and females suffered trauma that can be interpreted as intentional, the pattern of violent trauma on females suggests that those of prime reproductive age were most at risk. On the other hand, trauma for males is more dispersed throughout the age categories, and a greater proportion seems to have plausibly been accidental or occupational in nature. These patterns, in addition to the context and distribution of injuries on the skeleton, point toward the susceptibility of young females in particular to abuse. Although the majority of both males and females did not display signs of skeletal trauma, there is still a disparity between males and females in their risk for experiencing interpersonal violence. Provisionally, this does suggest an ideology of male control over reproductive-age females, whether or not this is often exercised in a violent manner.

Furthermore, nearly all of the individuals subject to post-mortem artificial widening or manipulation of the foramen magnum were female, and one individual of indeterminate



sex was buried in the feminine orientation. Additionally, most of the individuals with this treatment were buried in settlement pits. As described in the article (Toussaint, n.d.), this practice appears to single out those who were “other.” It does not appear to be a typical or an honorable treatment. If that is the case, the disproportionate number of females treated in this way suggests that there is something dangerous, threatening, or despised about certain females, which perhaps says something about the way femininity or feminine power is perceived ideologically. The sole male treated (SZ01/V) in this way was buried in a settlement pit. Other kinds of skeletal trauma and dental wear single him out as a special case.

Two females (SZ11/I and SZ11/VIII) make a convincing case for possible captives, and potentially the male mentioned above (SZ01/V) as well. All three individuals were buried in settlement pits in atypical positions. The male (SZ01/V) has the appearance of having been thrown into the pit unceremoniously, as does one of the females (SZ11/I) to a certain extent. Neither SZ01/V nor SZ11/VIII have any grave goods (except for one bone bead found with SZ11/VIII), but the other female (SZ11/I) is richly adorned with shell and faience beads and a needle, among other items (Baczyńska, 1994). The well-provisioned female (SZ11/I) is a Young Adult with severe OA of the hip, ankle, foot, and sacroiliac joint, a healed parry fracture of the left ulna, and several perimortem fractures to the cranium. The other female (SZ11/VIII) is an Older Adult with severe OA of the wrists, spine, and temporomandibular joint, a healed rib fracture, extensive non-alimentary tooth wear, and a large, healed cranial depression fracture. The male (SZ01/V) is a Young Adult with a healed cranial depression fracture, a healed hip fracture, and atypical, non-alimentary tooth wear. All three of these individuals have post-mortem modifications of the foramen magnum.

Furthermore, according to previous craniometric analyses, SZ11/I is an outlier among the other female crania from the same phase at Szarbia Zwierzyniecka, implying that perhaps she came from another population (Haduch, 1997).

Captive taking has been documented historically, ethnographically, and bioarchaeologically in a wide variety of cultures and far back into prehistory (Cameron, 2011; Martin et al., 2010). It appears that the majority of documented captives have been women and children—women targeted for their reproductive potential, and both women and children for their (perceived) docility relative to male captives (Cameron, 2011). Men were taken as captives as well, of course. Interestingly, in part because captives were sometimes viewed as *tools* to be used by the captor, rather than people, they may lose their gendered identity, and may be forced to do work normally reserved for the opposite sex (ibid.). This may be relevant in the case of SZ01/V, a young male discarded in a pit, and treated with a post-mortem ritual that otherwise is seen only among females. Captives are not only taken as slaves or laborers, but sometimes as marriage partners. In this context, it is worth noting that recent isotope studies confirmed the apparent patrilocal residence patterns and exogenous marriage practices of a population of the Danubian Early Bronze Age cultural area in southern Germany (Mittnik et al., 2019). Women were sometimes exchanged over vast distances according to this study. Perhaps significantly, this case study involves a population contemporaneous to MC communities and with a tradition of gendered burial practices.

## *Future Directions*

While this dissertation has provided significant evidence of gendered patterns of trauma and nutritional and metabolic stresses, and shed light on the intersection of gender and age, as well as fluidity and gray areas in how gender is represented in the mortuary context, some questions remain unanswered. Fortunately, this work helps to show some potential paths forward. Much work remains to be done with regard to clarifying the relationship between biological sex and atypical burial orientations. Furthermore, while it is generally assumed that subadult burial practices closely mirror those of adults, macroscopic anthropological methods cannot verify this. For both of these cases, ancient DNA studies and isotope studies would prove invaluable in ascertaining the biological sex and regional origin of individuals. Such information can help to sort through competing explanations of burial patterns and to further illuminate the histories of individuals who may have come from distant settlements.

Enteseal data has potential to reveal patterns of labor possibly related to salient social categories. However, the relatively small sample size and the quality of the data set has proven to be a significant obstacle in this dissertation. In the future, other large, previously excavated cemeteries can be investigated and added to this data set. Additionally, further exploration of the partially excavated Szarbia cemetery has been discussed. Although this will not solve the problems that are due to the state of preservation of the remains, it will nonetheless help to augment the analysis. Improvements to the methods of scoring entheses and exploring the data statistically would also be of great value. A future project is in the initial stages of planning, aiming to

collect enthesal data from an identified skeletal collection—with known age-at-death, sex, and occupational data—as a proof of concept of the clustering approach. Further down the road, an exploration of using laser scanning to more objectively quantify enthesal robusticity could help to gather data to a higher degree of resolution.

While improvements in technology, methods, and analyses are surely on the horizon, and are necessary for pushing the boundaries of our knowledge of past societies, equally imperative is a theoretically informed, biocultural approach to interpreting data and results. It is my hope that at the very least, this dissertation demonstrated the effectiveness of analyzing bioarchaeological data in the context of archaeological, ethnographic, historical, and theoretical input. And finally, I hope it also demonstrated the salience of gender as a unique lens through which to investigate social ties, power structures, economic models, and conceptual understandings of the world in prehistory.

## REFERENCES

- Allen T, Novak SA, Bench LL. 2007. Patterns of Injuries: Accident or Abuse. *Violence Against Women* **13**: 802–816. DOI: 10.1177/1077801207302040
- Allentoft ME et al. 2015. Population genomics of Bronze Age Eurasia. *Nature* **522**: 167–172. DOI: 10.1038/nature14507
- Anderson DL, Thompson GW, Popovich F. 1976. Age of Attainment of Mineralization Stages of the Permanent Dentition. *Journal of Forensic Sciences* **21**: 1035J. DOI: 10.1520/JFS1035J
- Anon. 2011. First Homosexual Caveman Found. *The Telegraph* 6th April
- Apel R, Dugan L, Powers R. 2013. Gender and Injury Risk in Incidents of Assaultive Violence. *Justice Quarterly* **30**: 561–593. DOI: 10.1080/07418825.2011.619558
- Armelagos GJ. 1998. Introduction: Sex, Gender, and Health Status in Prehistoric and Contemporary Populations. In *Sex and Gender in Paleopathological Perspective*, Grauer AL and Stuart-Macadam P (eds). Cambridge University Press: Cambridge; 1–10.
- Bąbel JT. 2013a. *Cmentarzyska Społeczności Kultury Mierzanowickiej na Wyżynie Sandomierskiej: Część 1: Obrządek Pogrzebowy*. Instytut Archeologii Uniwersytetu Rzeszowskiego: Rzeszów, Poland.
- Bąbel JT. 2013b. *Cmentarzyska Społeczności Kultury Mierzanowickiej na Wyżynie Sandomierskiej: Część 2: Źródła*. Instytut Archeologii Uniwersytetu Rzeszowskiego: Rzeszów.
- Baczyńska B. 1994. *Cmentarzysko Kultury Mierzanowickiej w Szarbi, Woj. Kieleckie: Studium Obrządku Pogrzebowego*. Secesja: Kraków, Poland.
- Baczyńska B. 2000a. Szarbia, gmina Koniusza, województwo Małopolskie, Stanowisko 14, Wykop I/2000: Opisy Obiektów 1-51. Instytut Archeologii i Etnologii Polskiej Akademii Nauk.
- Baczyńska B. 2000b. Szarbia: Stanowisko 14, gm. Koniusza, woj. Małopolskie. Instytut Archeologii i Etnologii Polskiej Akademii Nauk.
- Barth F. 1998. *Ethnic Groups and Boundaries: The Social Organization of Culture Difference*. Reprint. Waveland Press: Long Grove, IL.
- Bass WM. 2005. *Human Osteology: A Laboratory and Field Manual*. 5th ed. Missouri Archaeological Society: Springfield, MO.

Bertemes F, Heyd V. 2015. 2200 BC – Innovation or Evolution? The genesis of the Danubian Early Bronze Age. presented at the 7th Archaeological Conference of Central Germany, October 23-26, 2014 in Halle (Saale). Halle (Saale), Germany. 561–578 pp.

Bhandari M, Dosanjh S, Tornetta P, Matthews D. 2006. Musculoskeletal Manifestations of Physical Abuse After Intimate Partner Violence. *The Journal of Trauma: Injury, Infection, and Critical Care* **61**: 1473–1479. DOI: 10.1097/01.ta.0000196419.36019.5a

Bird CE, Rieker PP. 2008. Gender Differences in Health: Are they Biological, Social, or Both? In *Gender and Health: The Effects of Constrained Choices and Social Policies*. Cambridge University Press: Cambridge; 16–53.

Bonvillain N. 1998. *Women and Men: Cultural Constructs of Gender*. 2nd ed. Prentice-Hall: Upper Saddle River, NJ.

Brooks S, Suchey J. 1990. Skeletal Age Determination Based on the Os Pubis: a Comparison of the Acsádi-Nemeskéri and Suchey-Brooks Methods. *Human Evolution* **5**: 227–238.

Bruzek J. 2002. A Method for Visual Determination of Sex, Using the Human Hip Bone. *American Journal of Physical Anthropology* **117**: 157–168. DOI: 10.1002/ajpa.10012

Buikstra JE, Ubelaker DH. 1994. *Standards for Data Collection from Human Skeletal Remains*. Arkansas Archaeological Survey: Fayetteville, AR.

Butler J. 2006. *Gender Trouble: Feminism and the Subversion of Identity*. Routledge: New York.

Cameron CM. 2011. Captives and Culture Change: Implications for Archaeology. *Current Anthropology* **52**: 169–209. DOI: 10.1086/659102

Cardoso FA, Henderson CY. 2010. Enthesopathy formation in the humerus: Data from known age-at-death and known occupation skeletal collections. *American Journal of Physical Anthropology* : 550–560. DOI: 10.1002/ajpa.21171

Casimir MJ. 1992. The Dimensions of Territoriality: An Introduction. In *Mobility and Territoriality: Social and Spatial Boundaries among Foragers, Fishers, Pastoralists, and Peripatetics*, Casimir MJ and Rao A (eds). Berg: New York; 1–26.

Crandall ML, Nathens AB, Rivara FP. 2004. Injury Patterns among Female Trauma Patients: Recognizing Intentional Injury. *The Journal of Trauma: Injury, Infection, and Critical Care* **57**: 42–45. DOI: 10.1097/01.TA.0000135491.59215.86

Czebreszuk J. 2013. The Bronze Age in the Polish Lands. In *The Oxford Handbook of the European Bronze Age*, Fokkens H and Harding A (eds). Oxford University Press: Oxford; 767–786.

Diaz-Andreu M, Lucy S, Babić S, Edwards DN. 2005. *The Archaeology of Identity: Approaches to Gender, Age, Status, Ethnicity and Religion*. Routledge: London.

Donnan H, Wilson TM. 1999. *Borders: Frontiers of Identity, Nation and State*. Berg: Oxford.

Ember CR, Ember M, Frayer DW, Martin DL. 1997. Violence in the Ethnographic Record: Results of Cross-Cultural Research on War and Aggression. In *Troubled Times: Violence and Warfare in the Past*. Taylor & Francis Group: Boca Raton, FL; 1–20.

Fausto-Sterling A. 2000. *Sexing the Body: Gender Politics and the Construction of Sexuality*. Basic Books: New York.

Flores AR, Herman JL, Gates GJ, Brown TNT. 2016. How Many Adults Identify as Transgender in the United States? The Williams Institute.

Forgey K, Williams SR. 2005. Were Nasca Trophy Heads War Trophies or Revered Ancestors? Insights from the Kroeber Collection. In *Interacting with the Dead: Perspectives on Mortuary Archaeology for the New Millennium*, Rakita GFM, Buikstra JE, Beck LA, and Williams SR (eds). University Press of Florida: Gainesville, FL; 251–276.

Geller PL. 2008. Conceiving Sex: Fomenting a Feminist Bioarchaeology. *Journal of Social Archaeology* **8**: 113–138. DOI: 10.1177/1469605307086080

Geller PL. 2017. *The Bioarchaeology of Socio-Sexual Lives: Queering Common Sense About Sex, Gender, and Sexuality*. Springer International: Switzerland.

Gleń-Haduch E, Szostek K, Głąb H. 1997. Cribra orbitalia and trace element content in human teeth from neolithic and early bronze age graves in southern Poland. *American Journal of Physical Anthropology* **103**: 201–207. DOI: 10.1002/(SICI)1096-8644(199706)103:2<201::AID-AJPA5>3.0.CO;2-W

Goodman AH, Martin DL, Armelagos GJ, Clark G. 1984. Indications of Stress from Bone and Teeth. In *Paleopathology at the Origins of Agriculture*, Cohen MN and Armelagos GJ (eds). Academic Press: Orlando; 13–49.

Górski J, Jarosz P, Tunia K, Wilk S, Włodarczak P. 2013. New Evidence on the Absolute Chronology of the Early Mierzanowice Culture in South-Eastern Poland. In *From Copper to Bronze: Cultural and Social Transformations at the Turn of the 3rd/2nd Millennium B. C. in Central Europe*, Bartelheim M, Peška J, and Turek J (eds). Beier & Beran: Langenweißbach, Germany; 105–118.

Grauer AL, Stuart-Macadam P (eds). 1998. *Sex and Gender in Paleopathological Perspective*. Cambridge University Press: Cambridge.

Grémaux R. 1996. Woman Becomes Man in the Balkans. In *Third Sex Third Gender: Beyond Sexual Dimorphism in Culture and History*, Herdt G (ed). Zone Books: New York; 241–281.

- Gustafson G, Koch G. 1974. Age estimation up to 16 years of age based on dental development. *Odontologisk Revy* **25**: 297–306.
- Guyomarc'h P, Campagna-Vaillancourt M, Kremer C, Sauvageau A. 2010. Discrimination of Falls and Blows in Blunt Head Trauma: A Multi-Criteria Approach. *Journal of Forensic Sciences* **55**: 423–427. DOI: 10.1111/j.1556-4029.2009.01310.x
- Haak W et al. 2015. Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature advance online publication* DOI: 10.1038/nature14317
- Haduch E. 1997. *Ludność Kultury Mierzanowickiej z Szarbi, Woj. Kieleckie na Tle Populacji Środkowoeuropejskich z Wczesnego Okresu Epoki Brązu*. Wydawnictwo PiT: Kraków, Poland.
- Haig D. 2004. The inexorable rise of gender and the decline of sex: Social change in academic titles, 1945–2001. *Archives of sexual behavior* **33**: 87–96.
- Hammerl E. 2013. Dental Anthropology. In *Research Methods in Human Skeletal Biology*, DiGangi EA and Moore MK (eds). Academic Press: Boston; 263–291.
- Harding AF. 2000. *European societies in the Bronze Age*. Cambridge University Press.
- Harper C. 2007. *Intersex*. Berg: Oxford.
- Harrod RP, Lienard P, Martin DL. 2012. Deciphering Violence in Past Societies: Ethnography and the Interpretation of Archaeological Populations. In *The Bioarchaeology of Violence*. University Press of Florida Gainesville: Gainesville, FL; 63–80.
- Havelková P, Hladík M, Velemínský P. 2013. Enthesal Changes: Do They Reflect Socioeconomic Status in the Early Medieval Central European Population? (Mikulčice – Klášteřisko, Great Moravian Empire, 9th – 10th century). *International Journal of Osteoarchaeology* **23**: 237–251. DOI: 10.1002/oa.2294
- Hays-Gilpin K, Whitley DS (eds). 1998. *Reader in Gender Archaeology*. Routledge: New York.
- Henderson CY, Mariotti V, Pany-Kucera D, Villotte S, Wilczak C. 2013. Recording Specific Enteseal Changes of Fibrocartilaginous Enteses: Initial Tests Using the Coimbra Method. *International Journal of Osteoarchaeology* **23**: 152–162. DOI: 10.1002/oa.2287
- Herdt G. 1994. Mistaken Sex: Culture, Biology and the Third Sex in New Guinea. In *Third Sex, Third Gender: Beyond Sexual Dimorphism in Culture and History*, Herdt G (ed). Zone Books: New York; 419–445.
- Herodotus. 2014. *Histories*. Romm J (ed). Hackett Publishing: Indianapolis, IN.
- Hillson S. 2008. Dental pathology. In *Biological Anthropology of the Human Skeleton*, Katzenberg MA and Saunders SR (eds). Wiley-Liss: Hoboken, NJ; 301–340.



- Hollimon SE. 1996. Sex, Gender, and Health among the Chumash: An Archaeological Examination of Prehistoric Gender Roles. *Proceedings of the Society for California Archaeology* **9**: 205–208.
- Hughes IA. 2010. Congenital Adrenal Hyperplasia. In *Oxford Textbook of Medicine*, Warrell DA, Cox TM, and Firth JD (eds). Oxford University Press: Oxford; 1891–1900.
- Hughes IA, Deeb A. 2006. Androgen Resistance. *Best Practice & Research Clinical Endocrinology & Metabolism* **20**: 577–598. DOI: 10.1016/j.beem.2006.11.003
- Imperato-McGinley J, Peterson RE, Gautier T, Sturla E. 1979. Androgens and the Evolution of Male-Gender Identity among Male Pseudohermaphrodites with 5 $\alpha$ -Reductase Deficiency. *The New England Journal of Medicine* **300**: 1233–1237.
- Jaeger M. 2010. Transkarpackie Kontakty Kultury Otomani-Füzesabony. In *Transkarpackie Kontakty Kulturowe w Epoce Kamienia, Brązu i Wczesnej Epoce Żelaza*. Muzeum Podkarpackie w Krośnie: Krosno, Poland; 313–330.
- Jaeger M. 2014. The stone fortifications of the settlement at Spišský Štvrtok. A contribution to the discussion on the long-distance contacts of the Otomani-Füzesabony culture. *Prähistorische Zeitschrift* **89**: 291–304.
- Jaeger M, Olexa L. 2014. The Metallurgists from Nižná Myšľa (Okr. Košice-Okolie/SK): A Contribution to the Discussion on the Metallurgy in Defensive Settlements of the Otomani-Füzesabony Culture. *Archäologisches Korrespondenzblatt* **44**: 163–176.
- Jiráň L, Salaš M, Krenn-Leeb A. 2013. The Czech Lands and Austria in the Bronze Age. In *The Oxford Handbook of the European Bronze Age*, Fokkens H and Harding A (eds). Oxford University Press: Oxford; 787–812.
- Johnson M. 2011. *Archaeological Theory: An Introduction*. John Wiley & Sons: Chichester, West Sussex, UK.
- Joyce RA. 2008. *Ancient Bodies, Ancient Lives: Sex, Gender, and Archaeology*. Thames & Hudson: New York.
- Judd MA. 2008. The parry problem. *Journal of Archaeological Science* **35**: 1658–1666. DOI: 10.1016/j.jas.2007.11.005
- Juras A et al. 2020. Mitochondrial genomes from Bronze Age Poland reveal genetic continuity from the Late Neolithic and additional genetic affinities with the steppe populations. *American Journal of Physical Anthropology* DOI: 10.1002/ajpa.24057
- Kadrow S. 1991. Iwanowice, Babia Gora site: spatial evolution of an Early Bronze Age Mierzanowice culture settlement (2300-1600 BC). *Antiquity* **65**: 640–650.

- Kadrow S. 1994a. From Nomadism to the Sedentary Way of Life. *A case of the Evolution of the Late Neolithic and the Early Bronze Age Communities in South-Eastern Poland* : 2900–1650.
- Kadrow S. 1994b. Social Structures and Social Evolution among Early-Bronze-Age Communities in South-Eastern Poland. *Journal of European Archaeology* **2.2**: 229–248.
- Kadrow S. 2017. What Happened in Iwanowice at the End of the 3rd Millennium BC? Did a Rebellion Break Out? In *Rebellion and Inequality in Archaeology: Proceedings of the Kiel Workshops “Archaeology of Rebellion” (2014) and “Social Inequality as a Topic in Archaeology” (2015)*, Hansen S and Müller J (eds). In Kommission bei Verlag Dr. Rudolf Habelt GmbH: Bonn; 171–184.
- Kadrow S, Machnik J. 1997. *Kultura Mierzanowicka: Chronologia, Taksonomia i Rozwój Przestrzenny*. Polska Akademia Nauk, Oddział w Krakowie: Kraków, Poland.
- Kadrow S, Machnikowa A, Machnik J. 1992. *Iwanowice Stanowisko Babia Góra: Część II, Cmentarzysko z Wczesnego Okresu Epoki Brązu*. Secesja: Kraków, Poland.
- Kadrow S, Machnikowa A, Machnik J. 1995. Early Bronze Age Settlement on “Babia Góra” Site at Iwanowice Against the Background of the Contemporary Settlement Network in an Upper Vistula River Basin (SE Poland). presented at the *Memorie de Museo Civico di Storia Naturale di Verona*. 203–220 pp.
- Kempisty A. 1978. *Schyłek Neolitu i Początek Epoki Brązu na Wyżynie Małopolskiej w Świetle Badań nad Kopcami*. Wydawnictwa Uniwersytetu Warszawskiego: Warsaw.
- Kent S. 1999. Egalitarianism, Equality, and Equitable Power. In *Manifesting Power: Gender and the Interpretation of Power in Archaeology*, Sweely TL (ed). Routledge: London and New York; 30–46.
- Kimura M. 1983. *The neutral theory of molecular evolution*. Cambridge University Press.
- Kiszely I. 1970. On the Peculiar Custom of the Artificial Mutilation of the Foramen Occipitale Magnum: Summary of the Finds Known so Far (Plates XLV-LII). *Acta Archaeologica Academiae Scientiarum Hungaricae* **22**: 301–321.
- Kowalewska-Marszałek H, Duday H. 2014. Kichary Nowe Necropolis (Little Poland) and its Funerary Rituals, from the Middle Neolithic to the Early Bronze Age. In *Around the Petit-Chasseur Site in Sion (Valais, Switzerland) and New Approaches to the Bell Beaker Culture: Proceedings of the International Conference held at Sion (Switzerland) October 27th - 30th, 2011*, Besse M (ed). Archaeopress: Oxford; 295–306.
- Koziol KM. 2012. Performances of Imposed Status: Captivity at Cahokia. In *The Bioarchaeology of Violence*, Martin DL, Harrod RP, and Pérez VR (eds). University Press of Florida: Gainesville, FL;

Kremer C, Racette S, Dionne C-A, Sauvageau A. 2008. Discrimination of Falls and Blows in Blunt Head Trauma: Systematic Study of the Hat Brim Line Rule in Relation to Skull Fractures. *Journal of Forensic Sciences* **53**: 716–719. DOI: 10.1111/j.1556-4029.2008.00725.x

Krenz-Niedbała M. 1999. Harris Lines in a Skeletal Sample of the Neolithic and of the Early Bronze Age, Żerniki Górne (Poland). In *Biological and Cultural Consequences of the Transition to Agriculture in Central Europe*, Jankowska D, Krenz-Niedbała M, Piontek J, and Wierzbicki J (eds). Monografie Instytutu Antropologii UAM: Poznań, Poland; 105–114.

Laqueur T. 1990. *Making Sex: Body and Gender from the Greeks to Freud*. Harvard University Press: Cambridge, MA.

Larsen CS. 1998. Gender, Health, and Activity in Foragers and Farmers in the American Southeast: Implications for Social Organization in the Georgia Bight. In *Sex and Gender in Paleopathological Perspective*, Grauer AL and Stuart-Macadam P (eds). Cambridge University Press: Cambridge; 165–187.

Levy JE. 1999. Gender, Power, and Heterarchy in Middle-Level Societies. In *Manifesting Power: Gender and the Interpretation of Power in Archaeology*, Sweely TL (ed). Routledge: London and New York; 62–78.

Lorkiewicz W. 2011. Nonalimentary tooth use in the neolithic population of the Lengyel culture in central Poland (4600-4000 BC). *American Journal of Physical Anthropology* **144**: 538–551. DOI: 10.1002/ajpa.21435

Lovejoy CO. 1985. Dental Wear in the Libben Population: Its Functional pattern and Role in the Determination of Adult Skeletal Age at Death. *American Journal of Physical Anthropology* **68**: 47–56.

Lovejoy CO, Meindl RS, Pryzbeck TR, Mensforth RP. 1985. Chronological Metamorphosis of the Auricular Surface of the Ilium: a New Method for the Determination of Adult Skeletal Age at Death. *American Journal of Physical Anthropology* **68**: 15–28.

Mann RW, Hunt DR. 2005. *Photographic Regional Atlas of Bone Disease: A Guide to Pathologic and Normal Variation in the Human Skeleton*. 2nd ed. Charles C. Thomas: Springfield, IL.

Mariotti V, Facchini F, Belcastro MG. 2007. The study of entheses: proposal of a standardised scoring method for twenty-three entheses of the postcranial skeleton. *Collegium antropologicum* **31**: 291–313.

Marková K, Ilon G. 2013. Slovakia and Hungary. In *The Oxford Handbook of the European Bronze Age*, Fokkens H and Harding A (eds). Oxford University Press: Oxford; 813–836.

Martin DL. 1997. Violence Against Women in the La Plata River Valley (A.D. 1000-1300). In *Troubled Times: Violence and Warfare in the Past*, Frayer DW and Martin DL (eds). Taylor & Francis Group: Boca Raton, FL; 45–76.

Martin DL, Harrod RP. 2015. Bioarchaeological contributions to the study of violence. *American Journal of Physical Anthropology* **156**: 116–145. DOI: 10.1002/ajpa.22662

Martin DL, Harrod RP, Fields M. 2010. Beaten down and worked to the bone: Bioarchaeological investigations of women and violence in the ancient Southwest. *Landscapes of Violence* **1**: 3.

Martin MK, Voorhies B. 1975. *Female of the Species*. Columbia University Press: New York.

McKern TW, Stewart TD. 1957. Skeletal Age Changes in Young American Males: Analyzed from the Standpoint of Age Identification. Quartermaster Research and Development Command Technical Report EP-45: Natick, MA.

McNulty SL. 2016. *An Analysis of Skeletal Trauma Patterning of Accidental and Intentional Injury*, University of Tennessee, Knoxville: Knoxville, TN

Meindl RS, Lovejoy CO. 1985. Ectocranial Suture Closure: a Revised Method for the Determination of Skeletal Age-At-Death Based on the Lateral-Anterior Sutures. *American Journal of Physical Anthropology* **68**: 57–66.

Meindl RS, Lovejoy CO, Mensforth RP, Carlos LD. 1985. Accuracy and direction of error in the sexing of the skeleton: Implications for paleodemography. *American Journal of Physical Anthropology* **68**: 79–85. DOI: 10.1002/ajpa.1330680108

Milella M, Giovanna Belcastro M, Zollikofer CPE, Mariotti V. 2012. The effect of age, sex, and physical activity on enthesal morphology in a contemporary Italian skeletal collection. *American Journal of Physical Anthropology* **148**: 379–388. DOI: 10.1002/ajpa.22060

Milisauskas S, Kruk J. 2011. Late Neolithic/Late Copper Age 3500–2200 BC. In *European Prehistory*. Springer: New York; 293–325.

Milner GR, Larsen CS. 1991. Teeth as Artifacts of Human Behavior: Intentional Mutilation and Accidental Modification. In *Advances in Dental Anthropology*, Kelley MA and Larsen CS (eds). Wiley-Liss: New York; 357–378.

Mincer HH, Harris EF, Berryman HE. 1993. The A.B.F.O. study of third molar development and its use as an estimator of chronological age. *Journal of Forensic Sciences* **38**: 379–390.

Mittnik A et al. 2019. Kinship-based social inequality in Bronze Age Europe. *Science* **366**: 731–734. DOI: 10.1126/science.aax6219

Money J. 1955. Hermaphroditism, gender and precocity in hyperadrenocorticism: psychologic findings. *Bulletin of the Johns Hopkins Hospital* **96**: 253.

- Money J. 1993. *The Adam Principle. Genes, Genitals, Hormones, and Gender: Selected Readings in Sexology*. Prometheus Books: Buffalo, New York.
- Nanda S. 2014. *Gender Diversity*. 2nd ed. Waveland Press: Long Grove, IL.
- Niinimäki S. 2011. What do muscle marker ruggedness scores actually tell us? *International Journal of Osteoarchaeology* **21**: 292–299. DOI: 10.1002/oa.1134
- Niinimäki S, Baiges Sotos L. 2013. The Relationship Between Intensity of Physical Activity and Enteseal Changes on the Lower Limb. *International Journal of Osteoarchaeology* **23**: 221–228. DOI: 10.1002/oa.2295
- Niinimäki S, Niskanen M, Niinimäki J, Nieminen M, Tuukkanen J, Junno J-A. 2013. Modeling skeletal traits and functions of the upper body: Comparing archaeological and anthropological material. *Journal of Anthropological Archaeology* **32**: 347–351. DOI: 10.1016/j.jaa.2012.01.004
- Nwoko KC. 2012. Female Husbands in Igbo Land: Southeast Nigeria. *The Journal of Pan African Studies* **5**: 69–82.
- O’Kelly CG, Carney LS. 1986. *Women and Men in Society: Cross-Cultural Perspectives on Gender Stratification*. Wadsworth Publishing Company: Belmont, CA.
- Olalde I et al. 2018. The Beaker phenomenon and the genomic transformation of northwest Europe. *Nature* **555**: 190–196. DOI: 10.1038/nature25738
- Ortner DJ (ed). 2003. *Identification of Pathological Conditions in Human Skeletal Remains*. 2nd ed. Academic Press: San Diego.
- O’Shea JM. 1996. Maros Funerary Differentiation: Body Preparation and Treatment. In *Villagers of the Maros: A Portrait of an Early Bronze Age Society*. Springer Science+Business Media: New York; 139–186.
- Parker Pearson M. 1999. *The Archaeology of Death and Burial*. Texas A&M University Press: College Station, Texas.
- Pellow D. 1996. Introduction. In *Setting Boundaries: The Anthropology of Spatial and Social Organization*, Pellow D (ed). Bergin and Garvey: Westport, Connecticut; 1–8.
- Petridou E. 2002. What distinguishes unintentional injuries from injuries due to intimate partner violence: a study in Greek ambulatory care settings. *Injury Prevention* **8**: 197–201. DOI: 10.1136/ip.8.3.197
- Phenice TW. 1969. A Newly Developed Visual Method of Sexing the Os Pubis. *American Journal of Physical Anthropology* **30**: 297–301.
- Pitkin HF. 1972. *Wittgenstein and Justice: On the Significance of Ludwig Wittgenstein for Social and Political Thought*. University of California Press: Berkeley, CA.

- Pokutta DA. 2013. *Population Dynamics, Diet and Migrations of the Únětice Culture in Poland*, Dissertation, University of Gothenburg: Gothenburg, Sweden
- Porčić M, Stefanović S. 2009. Physical Activity and Social Status in Early Bronze Age Society: The Mokrin Necropolis. *Journal of Anthropological Archaeology* **28**: 259–273. DOI: 10.1016/j.jaa.2009.06.001
- Przybyła MS, Skoneczna M. 2013. The Fortified Settlement from the Early and Middle Bronze Age at Maszkowice, Nowy Sącz District (Western Carpathians). Preliminary Results of Studies Conducted in the Years 2009–2012. *Recherches Archéologiques* : 5–66.
- Rasmussen S. 2005. Pastoral nomadism and gender: Status and prestige, economic contribution, and division of labor among the Tuareg of Niger. In *Gender in Cross-Cultural Perspective*, Brettell CB and Sargent CF (eds). Pearson Prentice Hall: Upper Saddle River, NJ; 155–169.
- Robb J. 1997. Violence and Gender in Italy. In *Troubled Times: Violence and Warfare in the Past*, Frayer DW and Martin DL (eds). Taylor & Francis Group: Boca Raton, FL; 111–144.
- Rodseth L, Parker BJ. 2005. Introduction: Theoretical Considerations in the Study of Frontiers. In *Untaming the Frontier in Anthropology, Archaeology, and History*, Parker BJ and Rodseth L (eds). University of Arizona Press: Tuscon, AZ; 3–21.
- Roscoe W. 1991. *The Zuni Man-Woman*. University of New Mexico Press: Albuquerque, NM.
- Roscoe W. 1996. How to Become a Berdache: Toward a Unified Analysis of Gender Diversity. In *Third Sex Third Gender: Beyond Sexual Dimorphism in Culture and History*, Herdt G (ed). Zone Books: New York; 329–372.
- Rubin G. 1975. The Traffic in Women: Notes on the “Political Economy” of Sex. In *Toward an Anthropology of Women*, Reiter RR (ed). Monthly Review Press: New York; 157–210.
- Ruff CB et al. 2012. Stature and body mass estimation from skeletal remains in the European Holocene. *American Journal of Physical Anthropology* **148**: 601–617. DOI: 10.1002/ajpa.22087
- Scheuer L, Black S. 2000. *Developmental Juvenile Osteology*. Elsevier Academic Press: San Diego, CA.
- Schröder IW, Schmidt BE. 2001. Introduction: Violent imaginaries and violent practices. In *Anthropology of Violence and Conflict*, Schröder IW and Schmidt BE (eds). Routledge: New York; 1–24.
- Sofaer JR. 2006. *The Body as Material Culture: A Theoretical Osteoarchaeology*. Cambridge University Press: Cambridge.

- Sosna D. 2007. *Social Differentiation in the Late Copper Age and the Early Bronze Age in South Moravia (Czech Republic)*, Florida State University: Tallahassee, FL
- Sosna D, Galeta P, Sládek V. 2008. A Resampling Approach to Gender Relations: the Rebešovice Cemetery. *Journal of Archaeological Science* **35**: 342–354. DOI: 10.1016/j.jas.2007.04.001
- Spedding RL, McWilliams M, McNicholl BP, Dearden CH. 1999. Markers for domestic violence in women. *Emergency Medicine Journal* **16**: 400–402. DOI: 10.1136/emj.16.6.400
- Stig Sørensen ML. 2000. *Gender Archaeology*. Polity Press: Cambridge, MA.
- Stodder ALW. 2005. The Bioarchaeology and Taphonomy of Mortuary Ritual on the Sepik Coast, Papua New Guinea. In *Interacting with the Dead: Perspectives on Mortuary Archaeology for the New Millennium*, Rakita GFM, Buikstra JE, Beck LA, and Williams SR (eds). University Press of Florida: Gainesville, FL; 228–250.
- Stojanowski CM, Seidel AC, Fulginiti LC, Johnson KM, Buikstra JE. 2016. Contesting the massacre at Nataruk. *Nature* **539**: E8–E10. DOI: 10.1038/nature19778
- Todd TW. 1920. Age Changes in the Pubic Bone. I: The Male White Pubis. *American Journal of Physical Anthropology* **3**: 285–334.
- Todd TW. 1921. Age Changes in the Pubic Bone. II: The Pubis of the Male Negro-White Hybrid, III: The Pubis of the White Female, IV: The Pubis of the Female Negro-White Hybrid. *American Journal of Physical Anthropology* **4**: 1–70.
- Tomczyk J, Tomczyk-Gruca M, Zalewska M. 2012. Frequency and chronological distribution of linear enamel hypoplasia (LEH) in the Late Neolithic and Early Bronze Age population from Żerniki Górne (Poland) – preliminary report. *Anthropological Review* **75** DOI: 10.2478/v10044-012-0005-3
- Toussaint MP. 2019a. Queering Prehistory on the Frontier: A Bioarchaeological Investigation of Gender in Mierzanowice Communities of the Early Bronze Age. In *The Bioarchaeology of Frontiers and Borderlands*, Tica C and Martin DL (eds). University Press of Florida: Gainesville, FL;
- Toussaint MP. 2019b. The Dead Don't Bury Themselves: Reflections on Atypical Burial Arrangements and Gender in Mierzanowice Culture Cemeteries. *Sprawozdania Archeologiczne* **71**: 65–88.
- Toussaint MP. n.d. Gendered Patterns of Violence and Trauma in Mierzanowice Culture Cemeteries. *International Journal of Osteoarchaeology*
- Tung TA. 2012. Violence against women: Differential treatment of local and foreign females in the heartland of the Wari Empire, Peru. In *The Bioarchaeology of Violence*. University Press of Florida Gainesville: Gainesville, FL; 180–198.

- Turek J. 2016. Sex, Transsexuality and Archaeological Perception of Gender Identities. *Archaeologies* **12**: 340–358. DOI: 10.1007/s11759-017-9303-0
- Ubelaker DH. 1978. *Human Skeletal Remains: Excavation, Analysis, Interpretation*. Aldine: Chicago.
- Ubelaker DH. 1989. *Human Skeletal Remains: Excavation, Analysis, Interpretation*. 2nd ed. Taraxacum: Washington, D.C.
- Vandkilde H. 2007. *Culture and Change in Central European Prehistory 6th to 1st millennium BC*. Aarhus Universitetsforlag.
- Vaňharová M, Drozdová E. 2008. Sex Determination of Skeletal Remains of 4000 Year Old Children and Juveniles from Hoštice 1 za Hanou (Czech Republic) by Ancient DNA Analysis. *Anthropological Review* **71**: 63–70.
- Villotte S, Castex D, Couallier V, Dutour O, Knüsel CJ, Henry-Gambier D. 2010. Enthesopathies as occupational stress markers: Evidence from the upper limb. *American Journal of Physical Anthropology* **142**: 224–234. DOI: 10.1002/ajpa.21217
- Villotte S, Knüsel CJ. 2013. Understanding Enteseal Changes: Definition and Life Course Changes. *International Journal of Osteoarchaeology* **23**: 135–146. DOI: 10.1002/oa.2289
- Waldron T. 2009. *Palaeopathology: Cambridge Manuals in Archaeology*. Cambridge University Press: Cambridge.
- Walker PL. 1997. Wife Beating, Boxing and Broken Noses: Skeletal Evidence for the Cultural Patterning of Violence. In *Troubled Times: Violence and Warfare in the Past*, Frayer DW and Martin DL (eds). Taylor & Francis Group: Boca Raton, FL; 145–180.
- Wedel VL, Galloway A (eds). 2014. *Broken Bones: Anthropological Analysis of Blunt Force Trauma*. 2nd ed. Charles C. Thomas: Springfield, IL.
- White TD. 1992. *Prehistoric Cannibalism at Mancos 5MTUMR-2346*. Princeton University Press: Princeton, New Jersey.
- White TD, Folkens PA. 2005. *The Human Bone Manual*. Elsevier: New York.
- Wilson M, Daly M. 1993. An Evolutionary Psychological Perspective on Male Sexual Proprietariness and Violence Against Wives. *Violence and Victims* **8**: 271–294. DOI: 10.1891/0886-6708.8.3.271
- Wilson TM, Donnan H. 1998. Nation, State and Identity at International Borders. In *Border Identities: Nation and State at International Frontiers*, Wilson TM and Donnan H (eds). Cambridge University Press: Cambridge; 1–30.



Włodarczak P. 2014. The Traits of Early-Bronze Pontic Cultures in the Development of Old Upland Corded Ware (Małopolska Groups) and Złota Culture Communities. *Baltic-Pontic Studies* **19**: 7–52.

Włodarczak P. 2017a. Battle-Axes and Beakers. The Final Eneolithic Societies. In *The Past Societies: Polish Lands from the First Evidence of Human Presence to the Early Middle Ages*, Włodarczak P (ed). Institute of Archaeology and Ethnology, Polish Academy of Sciences: Warsaw, Poland; 275–336.

Włodarczak P. 2017b. Małopolska at the Beginning of the Bronze Age (2000-1600 BC). In *The Past Societies: Polish Lands from the First Evidence of Human Presence to the Early Middle Ages*, Bugaj U (ed). Institute of Archaeology and Ethnology, Polish Academy of Sciences: Warsaw, Poland; 49–85.

Włodarczak P. 2017c. Towards the Bronze Age in South-Eastern Poland (2300-2000 BC). In *The Past Societies: Polish Lands from the First Evidence of Human Presence to the Early Middle Ages*, Włodarczak P (ed). Institute of Archaeology and Ethnology, Polish Academy of Sciences: Warsaw, Poland; 377–397.

Wolf ER. 1990. Distinguished lecture: Facing power—old insights, new questions. *American anthropologist* **92**: 586–596.

## CURRICULUM VITAE

Mark Toussaint, Ph.D.

mr.mark.p.t@gmail.com

### Research Interests

Bioarchaeology, gender & gender variants in prehistory, embodiment, ethnogenesis, paleopathology, violence, entheses and activity, Bronze Age Central Europe, statistics

### Education

**PhD, Anthropology** University of Nevada Las Vegas (2020)

**M.A., Anthropology** University of California, Riverside (2012)

**B.S., Physics** Indiana University (2003)

### Awards, Fellowships, and Scholarships

UNLV Outstanding Graduate Student Teaching Award (\$2000)	2020
UNLV Summer Faculty Research Stipend (\$3000)	Summer 2018
Edwards & Olswang Grant in Support of Professional Activity (\$800)	Spring 2018
UNLV Summer Faculty Research Stipend (\$3000)	Summer 2017
UNLV GPSA Sponsorship Funding (\$450)	Fall 2016
UNLV International Programs Scholarship (\$1000)	Summer 2016
Graduate Assistantship, University of Nevada Las Vegas	Spring 2016 & 2017
UNLV GPSA Sponsorship Funding (\$1250)	Spring 2016
Friends of World Anthropology Scholarship (\$800)	Spring 2016
UNLV International Programs Scholarship (\$1000)	Summer 2015
UNLV GPSA Sponsorship Funding (\$375)	Spring 2015
Graduate Assistantship, University of Nevada Las Vegas	2014 – 2015
Scholarship for Summer Institute in Statistical Genetics, UW	Summer 2012
Dean's Distinguished Fellowship, University of California Riverside	2011 – 2013

## Teaching Experience

### ***As Instructor of Record***

Intro. to Biological Anthropology (ANTH 102)	Univ. of Nevada Las Vegas	S 2020
	Univ. of Nevada Las Vegas	S 2019
	Univ. of Nevada Las Vegas	F 2018
Intro. to Cultural Anthropology (ANTH 101)	Univ. of Nevada Las Vegas	F 2019
	College of Southern Nevada	F 2019
	Univ. of Nevada Las Vegas	S 2019
	College of Southern Nevada	F 2018
	Univ. of Nevada Las Vegas	F 2016
Physical Anth. Laboratory (ANTH 110L)	Univ. of Nevada Las Vegas	S 2020
	Univ. of Nevada Las Vegas	S 2017
	Univ. of Nevada Las Vegas	Sum. 2015
	Univ. of Nevada Las Vegas	S 2014
	Univ. of Nevada Las Vegas	F 2014

### ***As Teaching Assistant (Led Discussion Sections)***

Introduction to Archaeology (ANTH 005)	Univ. of California Riverside	SQ 2014
Intro. to Cultural Anthropology (ANTH 001)	Univ. of California Riverside	WQ 2014
	Univ. of California Riverside	WQ 2013
Intensive writing section (ANTH 001W)	Univ. of California Riverside	SQ 2013
Intro. to Biological Anthropology (ANTH 002)	Univ. of California Riverside	FQ 2013
	Univ. of California Riverside	FQ 2012

### ***Other***

Gross Anatomy, Adjunct Professor	Touro University Nevada	F 2018
Seventh-Grade Mathematics, Teach For America, Los Angeles	Markham Middle School	2003-2005

## Publications

### **Toussaint, Mark P.**

(Under review) Gendered Patterns of Violence and Trauma in Mierzanowice Communities of the Early Bronze Age. *International Journal of Osteoarchaeology* (Submitted 4/6/20).

### **Toussaint, Mark**

2019 The Dead Don't Bury Themselves: Reflections on Atypical Burial Arrangements and Gender in Mierzanowice Culture Cemeteries. *Sprawozdania Archeologiczne* 71:65–88.

### **Toussaint, Mark P.**

2019 Queering Prehistory on the Frontier: A Bioarchaeological Investigation of Gender in Mierzanowice Communities of the Early Bronze Age. In *The Bioarchaeology of Frontiers and Borderlands*, edited by Cristina Tica and Debra L. Martin, pp. 55–79. Gainesville, FL: University Press of Florida.

## Conference Presentations

### **American Anthropological Association**

*Knowledge Production and Framing in Biological Anthropology: Perspectives and Case Studies* (**Session Organizer and Chair**); 2018  
*Postmodern Paradox: Communicating the Relevance of Anthropology in the “Fake News” Era* (**Podium**); Mark Toussaint, University of Nevada Las Vegas (UNLV)

### **American Association of Physical Anthropologists**

*An Analysis of Gender Constructs in an Early Bronze Age Population Through Principal Coordinates Analysis of Scored Enteseal Changes* (**Poster**); 2017  
Mark Toussaint, University of Nevada Las Vegas (UNLV)  
Piotr Włodarczak, IAE Polish Academy of Sciences, Kraków (IAEPAN)

### **Paleopathology Association**

*Non-Masticatory Tooth Wear in an Early Bronze Age Population from Southern Poland* (**Poster**); Mark Toussaint (UNLV) & Piotr Włodarczak (IAEPAN) 2017

## **Society for American Archaeology**

*Queer Eye for the Dead Guy: The Influence of Debra Martin on a Bioarchaeological Investigation of Gender Beyond the Binary (Podium);* Mark Toussaint (UNLV) 2020

### **Conference cancelled due to COVID-19**

*Gendered Trouble: Reconsidering the Role of Females in the Masculinized Spaces of Violence in an Early Bronze Age Population (Podium);* Mark Toussaint (UNLV) 2019

*Temporal and Spatial Liminality in Early Bronze Age Central Europe: A Bioarchaeological Analysis of a Mierzanowice Culture Cemetery (Podium);* Mark Toussaint (UNLV) & Piotr Włodarczak (IAEPAN) 2016

*Bioarchaeology of the Arabian Bronze Age: Humeral Enthesal Changes and Burial Patterns at Tell Abraaq (Podium, Chair of General Session);* Mark Toussaint & Debra Martin (UNLV) 2015

## **Western Bioarchaeology Group**

*Habitus, Enthesal Development, and Gender: A Bioarchaeological Investigation of Embodiment in an Early Bronze Age Community in Southeastern Poland (Poster);* Mark Toussaint (UNLV) & Piotr Włodarczak (IAEPAN) 2016

*Labor, Life, and Death at Tell Abraaq: Enthesal Changes and Community History in the Arabian Bronze Age (Poster);* Mark Toussaint & Amber E. Osterholt (UNLV) 2015

*Identity, the Body, and the Search for Bioarchaeological Predictors of Obesity (Poster);* Mark Toussaint (UNLV) & Virginia Estabrook (University of California Riverside) 2014

## **“Working Your Fingers to the Bone,” University of Coimbra, Portugal**

*Habitus, Enthesal Development, and Gender: A Bioarchaeological Investigation of Embodiment in an Early Bronze Age Community in Southeastern Poland (Poster);* Mark Toussaint (UNLV) & Piotr Włodarczak (IAEPAN) 2016

## **James Young Colloquium, University of California Riverside**

*Habitus, Embodiment, and Gender: Bioarchaeological Approaches to Identity (Podium)* Mark Toussaint (UNLV) & Piotr Włodarczak (IAEPAN) 2016

## Field Experience

<b>Archaeological Field Assistant</b>	July 2017
Institute of Archaeology of the Czech Academy of Sciences Project Director: Dr. Dagmar Dreslerová	
<b>Junior Assistant on Staff</b>	Summer 2015
Mortuary Archaeology Field School (Session II), Drawsko, Poland Project Coordinator: Dr. Marek Polcyn; Site Director: Elżbieta Gajda, MA	
<b>Student</b>	July 2014
Mortuary Archaeology Field School, Drawsko, Poland Project Coordinator: Dr. Marek Polcyn; Site Director: Elżbieta Gajda, MA	
<b>Student</b>	July 2008
Maya Research Program, Belize Director: Dr. Tom Guderjan	

## Service to Field

<b>English Language Editor</b>	Since 2018
Sprawozdania Archeologiczne (Polish archaeological journal)	
<b>Ad Hoc Reviewer</b>	
International Journal of Osteoarchaeology	Since 2016
Journal of Anthropological Archaeology	Since 2020
<b>Vice President</b>	2015 – 2016
UNLV Anthropology Society	

## Affiliations and Memberships

American Anthropological Association	Since 2018
Paleopathology Association	Since 2016
American Association of Physical Anthropologists	Since 2016
Lambda Alpha Anthropology Honor Society	Since 2015
Society for American Archaeology	Since 2014