2002

Evidence of postmortem cultural modification of the femora and the Poole-Rose ossuary as part of the Feast of the Dead ceremony

Lori Kay Schiess
Louisiana State University and Agricultural and Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_theses

Part of the Social and Behavioral Sciences Commons

Recommended Citation
Schiess, Lori Kay, "Evidence of postmortem cultural modification of the femora and the Poole-Rose ossuary as part of the Feast of the Dead ceremony" (2002). LSU Master's Theses. 1074.
https://digitalcommons.lsu.edu/gradschool_theses/1074

This Thesis is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Master’s Theses by an authorized graduate school editor of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.

A Thesis

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Master of Arts

in

The Department of Geography and Anthropology

by

Lori Kay Schiess
B.A., Idaho State University, 1999
August 2002
ACKNOWLEDGMENTS

My first thanks must go to Chief Nora Bothwell of Alderville First Nation and Dr. Heather McKillop for allowing the study of the Poole-Rose ossuary. My gratitude for the opportunity to study the collection is unending.

To my committee, Ms. Mary Manhein, my advisor, and Drs. Heather McKillop and Andrew Curtis, thank you for your support and your help in the various stages of the writing of this thesis.

A special thank you to my friends and colleagues. First to L.A., a huge thanks for all the help with my computer and for the great photos. To Erin and Natalie, you are my sanity. When I got crazy, you always found a way to bring order back to my world. To Jered, you are my sounding board; thank you for the hours of late night phone calls and hundreds of emails that nudged me and helped me to find my way when I needed it.

Finally, to Lorin and Patricia Schiess, my parents, and Lindsay, my sister, I love you guys! Though you haven’t always understood my work, you supported me anyway. I wouldn’t be where I am without you. Your love and support at every step carried the day. Just saying thank you will never be enough.
# TABLE OF CONTENTS

ACKNOWLEDGEMENTS..........................................................ii

LIST OF TABLES...............................................................iv

LIST OF FIGURES...........................................................v

ABSTRACT.................................................................vi

CHAPTER

ONE INTRODUCTION.......................................................1

TWO THE HURON...........................................................4

THREE LITURATURE REVIEW OF FEMORAL ANATOMY
AND CUTMARKS..........................................................14
  Femoral Anatomy......................................................14
  Cutmarks...............................................................18

FOUR MATERIALS AND METHODS........................................22

FIVE RESULTS............................................................29
  Minimum Number of Individuals.................................29
  Cutmarks...............................................................31
  Measurements of the Femur........................................37
  Sex Estimates from the Femur.....................................38
  Comparison of Femoral Measurements with
    Other Native Groups............................................39
  Cutmarks by Left or Right Side...................................41
  Location of the Cutmarks on the Femur by
    Sex.................................................................42

SIX DISCUSSION AND CONCLUSIONS....................................44

REFERENCES..............................................................47

VITA.......................................................................52
LIST OF TABLES

3.1 Location of the muscles involved in the hip joint...15

3.2 Location of the muscles of the thigh.................15

5.1 Reported MNI of the Poole-Rose ossuary.............30

5.2 Frequency and percentages of cutmarks per zone of
the left femora.......................................36

5.3 Frequency and percentages of cutmarks per zone of
the right femora......................................37

5.4 Summary statistics of femoral measurements (in
mm).........................................................38

5.5 Females and males estimated from maximum head
diameter of femora....................................39

5.6 Comparison of the mean maximum length (ML) of femora
for males and females from the Poole-Rose ossuary
with other native groups (in mm).......................40

5.7 Comparison of the mean maximum head diameter (MHD)
of femora for males and females from the Poole-Rose
ossuary with other native groups (in mm)..............41

5.8 Observed (left table) and expected (right table)
values of cutmarks in all zones for the left femora.42

5.9 Observed (left table) and expected (right table)
values of cutmarks in all zones for the right
femora..................................................42

5.10 Observed (left table) and expected (right table)
values of cutmarks in zone one for males and
females..................................................43

5.11 Observed (left table) and expected (right table)
values of cutmarks in zone two for males and
females..................................................43

5.12 Observed (left table) and expected (right table)
values of cutmarks in zone three for males and
females..................................................43
LIST OF FIGURES

2.1 Map of Southern Ontario showing the location of ossuaries........................................5

2.2 Map of Iroquoian Groups of the Great Lakes........7

3.1 Anterior view of the superficial muscles of the hip and thigh.................................16

3.2 Posterior view of the superficial muscles of the hip..................................................16

3.3 Anterior view of the deep muscles of the hip and thigh............................................17

3.4 Posterior view of the deep muscles of the hip........17

3.5 Posterior view of the deep muscles of the thigh.....18

4.1 Diagram of the left femur showing cutmark zones.....24

5.1 Cutmarks (see red arrows) in zone one, posterior view of left femur 7-23-11..................32

5.2 Cutmarks (see red arrows) in zone one, anterior-superior view of left femur 1-23-617........33

5.3 Cutmarks (see red arrows) in zone two, anterior-lateral view of left femur 2-23-684...........33

5.4 Cutmarks (see red arrows) in zone two, anterior view of right femur 12-99-39................34

5.5 Cutmark (see red arrows) in zone three, posterior view of right femur 12-99-39...............34

5.6 Cutmarks (see red arrows) in zone three, anterior view of left femur 3-23-41....................35

5.7 Cutmarks (see red arrows) in zone three, posterior view of left femur 3-23-41..................35
ABSTRACT

This study analyzes cutmarks on the femora from the Poole-Rose ossuary as evidence of postmortem cultural modification related to the Feast of the Dead. The ossuary is located in southern Ontario, Canada, and dates to A.D. 1550 ±50. The Feast of the Dead is a burial custom associated with the Huron and other groups of the Great Lakes. The relative size of the population is compared to other indigenous North American skeletal populations.

The MNI using the femur for the adults of the Poole-Rose ossuary is 248, based on the presence of the proximal half of the shaft. The subadult MNI is 52, based on the lesser trochanter or the epiphyseal surface of the lesser trochanter. Only adult femora were examined in the cutmark analysis. Of the adults, sixteen percent of the Poole-Rose population shows evidence of cutmarks. In total, approximately 30 percent of the femoral specimens recovered show cutmark damage. The cutmarks appear in three general areas or zones. Zone one is defined as the neck of the femur; zone two is the proximal half of the shaft, below the greater and lesser trochanter; and zone three is the distal half of the shaft. Chi-square analysis shows the pattern of cutmarks occurrence to be random between males and females and random between the zones of the femora.
Comparison of the relative size of the Poole-Rose population to other indigenous North American skeletal populations shows the people of this ossuary to be very tall and robust.

The results of this study indicate that the Poole-Rose ossuary is consistent with the ethnographic account of attributes associated with the Huron Feast of the Dead.
CHAPTER ONE: INTRODUCTION

The Huron was a native group with a rich cultural history set in the Great Lakes region of North America. This group was a source of fascination to the missionaries and explorers of the seventeenth century (Thwaites 1897; Tooker 1964; Trigger 1969). Archaeologists and physical anthropologists continue to examine the remains of the people and their culture (Axtell 1981; Churcher and Kenyon 1960; Hale 1963; Knight and Melbye 1983; Melbye 1983; Pfeiffer 1983; Sullivan and Melbye 1979; Tooker 1964; Trigger 1969). Through close examination of the remnants of Huron villages and the remains of the people, scholars can both learn new information and confirm ethnographic accounts of the past.

Many scholars have focused on ossuaries. An ossuary is a secondary burial with multiple individuals, usually disarticulated (Curry 1999:3; McKillop and Jackson 1991:10; Ubelaker 1974:8). The ossuaries located in the Great Lakes region of North America may be associated with an elaborate burial ceremony called the Feast of the Dead. A single eyewitness account exists giving details of the ceremony among the Huron (Thwaites 1897), though other explorers discuss the ceremony (Tooker 1964; Trigger 1969; Ubelaker 1974). Ossuaries are one of the best sources of
information for scholars studying prehistoric demography (Pfeiffer 1983:9; Ubelaker 1974:7). The mortuary practice associated with ossuaries has been examined extensively, but the focus among physical anthropologists is generally on the basic demographic information that can be determined from the remains found in the ossuary and the occurrence of diseases among the population (Bordelon 1997; Churcher and Kenyon 1960; Dunne 1999; Harris 1949; Jurmain 1978; Katzenburg and White 1979; Kelly 2001; Listi 1997; Lundin 2000; Melbye 1983; Melbye 1985; Pfeiffer 1983; 1985; 1991; Pfeiffer et al. 1985; Seidemann 1999; Smith 1997; Sullivan and Melbye 1979; Ubelaker 1974; Verano and Ubelaker 1992).

In 1990, the Poole-Rose ossuary, the focus of the current study, was discovered and excavated under the direction of Dr. Heather McKillop in southern Ontario, Canada (McKillop and Jackson 1991). Upon completion of the excavation, a representative of Alderville First Nation brought the skeletal remains of the Poole-Rose ossuary to Louisiana State University (LSU) where they are currently being studied by agreement between Dr. McKillop and Alderville First Nation. Dr. Robert Tague, Ms. Mary Manhein, and Dr. McKillop direct the research (Tague et al. 1998). Several graduate students have completed studies on the remains at LSU (Bordelon 1997; Dunne 1999; Kelly 2001;
Listi 1997; Lundin 2000; Seidemann 1999; Smith 1997). Research on the ossuary includes degenerative joint disease, Harris lines, nonmetric traits of the skull, cribra orbitalia, and porotic hyperostosis.

The current study will focus on the postmortem cultural modifications seen on the femora of the Poole-Rose ossuary to determine if they are consistent with the description of the Huron Feast of the Dead. The relative size of the individuals represented in the ossuary will be compared to those of other indigenous North American skeletal populations.
CHAPTER TWO: THE HURON

The Poole-Rose ossuary was discovered in southern Ontario, Canada (Figure 1.1), in the summer of 1990 by building contractors. Skeletal remains were uncovered while digging a trench several meters behind a nineteenth century farmhouse. The police were notified of the discovery and Chief Nora Bothwell of the Alderville First Nation was contacted. She asked Dr. Heather McKillop to accompany her to the site to help determine what should be done. The remains were determined to be of Native Canadian descent. An agreement was made to have the site excavated, the skeletal materials studied, and the remains repatriated to the Alderville First Nation for burial (McKillop, personal communication 2002; McKillop and Jackson 1991).

Upon further investigation, researchers determined that the ossuary was larger than originally thought. Beginning approximately 2.5 meters below the current ground surface, the site extended to a depth of about 1.5 meters and was approximately 2.5 meters in diameter. The site is a Late Woodland site which was radiocarbon dated to A.D. 1550 ±50. The Poole-rose ossuary is "a major (site) of great significance both to archaeologists and to the First
Figure 2.1 Map of Southern Ontario showing the location of ossuaries (from McKillop and Jackson (1991, see their Figure 1)).

1. Poole-Rose
2. Williams
3. Uxbridge
4. Garland
5. Fairty
6. Tabor Hill
7. Keffer
8. Kleinburg
9. Glen Williams
10. Carton
11. Middleport
12. Orchid
13. Ossossane
14. Maurice
15. Syers
16. Bosomworth
17. Innisfil
18. Nottawasaga
19. Milne
20. Wentworth
21. Aaron Main
22. Dorchester
23. Humberstone
24. Sherk’s
25. Clearville
26. Grimsby
Nation’s peoples in eastern Ontario” (McKillop and Jackson 1991:9). A single deposition event of several hundred individuals of varying age and sex is represented. No artifacts were recovered (McKillop and Jackson 1991:10). The overall pattern seen in the Poole-Rose ossuary is consistent with the mortuary practice associated with the Huron Feast of the Dead (McKillop and Jackson 1991:10).

The Huron were an Iroquoian-speaking group who lived in the Great Lakes area of North America (Trigger 1969:6). The Iroquois, the Neutral, and the Wenro also lived in the same region (Figure 2.1) and are generally seen as being very similar in many aspects of their culture and subsistence (Fenton 1971:129; Fenton 1978:296; White 1978:410). The study of the Huron by Europeans dates back to the times of the earliest explorers. The majority of the ethnographic information about the Huron is taken from the accounts of the Jesuits during the seventeenth century (Thwaites 1897; Tooker 1964; Trigger 1969). One aspect of Huron culture, the large ossuary burials associated with the Feast of the Dead, is of particular interest to physical anthropologists. An ossuary is a secondary burial with multiple individuals, usually disarticulated (Curry 1999:3; McKillop and Jackson 1991:10; Ubelaker 1974:8).
Figure 2.2 Map of the Iroquoian Groups of the Great Lakes.

Ossuaries can provide a snapshot of the biological profile of a Huron village at one moment in time.

The Huron confederacy consisted of a league of four nations, or tribes, who shared a common language (Tooker 1964:9). The four tribes were the Attignawantan, the Attingueenongnahac, the Ahrendarrhonon (also called the Contarearonon), and the Tahontaenrat (Trigger 1969:13-14). The Huron home area, called Huronia, is an area bounded by Lake Simcoe on the east, and Lake Huron and Georgia Bay on the west and north, respectively (McKillop, personal communication 2002).

The Huron descended from earlier Woodland cultures (Trigger 1969:21). Subsistence for the Huron consisted of
a combination of agriculture, hunting, gathering, and fishing. These people represent the “most northern occurrence of (horticulturalists) in prehistoric North America” (Melbye 1985:9). A division of labor among the men and women was clearly seen. As active “traders and canoemen” (Fenton 1971:138), Huron men were responsible for hunting, fishing, warring, trading, house construction, and canoe manufacturing (Tooker 1964:59). Women were responsible for the tilling, harvesting, and processing of corn and other cultivated crops. The women were also responsible for wild food gathering, wood gathering, pottery production, and the preparation of hemp and bark (Tooker 1964:58-59).

A seasonal cycle kept many of the people away from their village most of the year. People departed the village to participate in their summer activities. Those activities included trading, hunting, fishing, warfare, and agriculture (Tooker 1964:71). The men were occupied with the hunting and trading. The women spent their time tending to the fields. In the fall, fishing activity was followed by a period of intense hunting. By December, most of the inhabitants returned to the village for the winter months. Winter was a time for playing games, feasting, and dancing (Tooker 1964:71-72).
The typical Huron village was “a cluster of closely spaced longhouses, interspersed with small open areas and sometimes surrounded by a palisade” (Heidenreich 1978:377). A single village could have as many as 100 longhouses and 300 or 400 people residing in those houses (Tooker 1964:40). An average longhouse had four to five fires, with two families sharing a fire (Tooker 1964:40).

The overall health of the Huron appears to be good. No evidence of nutritional diseases such as scurvy, pellagra, or rickets is found. The Huron are described as a very healthy and robust population (Heidenreich 1978:379).

The Huron believed in an afterlife that was similar to the world of the living (Heidenreich 1978:374). Knight and Melbye (1983:37) point out “that care of the dead was highly developed among the Huron.” Upon death, the body was placed in a flexed position and wrapped tightly (Tooker 1964:129). One individual in each family was appointed to look after the dead. Burial was usually the third day after death (Thwaites 1897:269; Tooker 1964:130; Trigger 1969:105). The ritual began with a feast to feed visitors “...and to provide an occasion for the exchange of food to console each other” (Tooker 1964:130). Mourning, for the Huron, was an exaggerated and extravagant event (Hale
The body was carried to the cemetery by four men and placed in an enclosed scaffold that was eight to ten feet tall and lightly painted. The structure was supported on four posts. In rare cases, the body was buried and a tomb was then built over the grave (Tooker 1964:130-131; Trigger 1969:106).

The placement of the dead on the scaffold was a temporary interment. Every ten to twelve years, the Huron village would hold the Feast of the Dead, often called ‘the kettle’ by the Huron, where the remains of all those who had died since the last feast were placed into an ossuary (Donnelly 1975:38; Hale 1963:72; Harris 1949:71; Tooker 1964:134; Trigger 1969:107). The feast often coincided with the periodic relocation of a Huron village (Trigger 1969:107). The ceremony lasted about ten days and included people from neighboring villages (Donnelly 1975:38; Tooker 1964:137; Trigger 1969:108).

Jean de Brébeuf, a Jesuit priest who lived among the Huron, was responsible for the only written, first-hand account of the Feast of the Dead. Brébeuf witnessed the ceremony in the spring of 1636 (Fenton and Kurath 1985:143; Thwaites 1897; Tooker 1964:135; Trigger 1969:110). The ceremony took place near Ossossané in Simcoe County,
Ontario. Kenneth Kidd later excavated this site in 1946 (Kidd 1953; Sullivan and Melbye 1979:85).

The Huron believed a person possessed two souls. The two souls stayed with the body in the cemetery. One soul would remain with the body until it was reborn as a child (Knight and Melbye 1983:37). The destination of the other soul varied. The souls of small children and the elderly did not leave for the village of the dead. The souls of these people were thought to be too weak to make the journey (Tooker 1964:141), so they “remained in Huronia where they had their own villages (of the dead)” (Knight and Melbye 1983:37). The souls of those killed in battle had their own village because they were feared and not allowed into the village of the dead. The souls of those who committed suicide were also not allowed into the village of the dead (Tooker 1964:141). The Feast of the Dead was a vital part of the travel to the afterlife. (Axtell 1981:201; Donnelly 1975:40; Tooker 1964:139-140).

The ossuary pit was dug near the village and lined with robes. A platform was built on the edge of the pit (Axtell 1981:201; Tooker 1964:136). The pit varied in size and shape, depending on the number of individuals being buried. Not all individuals were placed in the ossuary pit during the Feast of the Dead. Infants were often buried by
a road or path so that they could re-enter a woman and be reborn (Tooker 1969:132). In cases where individuals died by drowning or freezing, their flesh was removed from the body and burned. The rest of the body was then “thrown into a ditch” (Tooker 1969:132). Those who died a violent death were “burned or buried immediately, often still while half alive” (Tooker 1969:132). In any of the above cases, the remains were not placed in the ossuary during the Feast of the Dead.

The remains of those placed into the ossuary were taken from the scaffolds or removed from the ground. Remains varied in condition from completely skeletonized to fresh (recently deceased). A family representative then prepared the remains for reburial in the ossuary where any remaining soft tissue was removed and the bones were cleaned and washed. Recently deceased individuals were left as they were. All remains were then bundled in fine beaver skins (Donnelly 1975:39; Tooker 1964:136; Trigger 1969:108). On the last morning of the feast, the remains were emptied into the pit. The family of the deceased kept the robes in which the remains had been wrapped in remembrance of the deceased family member. Some young men in the pit mixed the remains as they were thrown in. When the pit was filled within two feet of the top, the robes
lining the pit were folded over the top of the remains. Then, mats and bark were used to finish covering the bones. In the final step, sand and poles were used to finish closing the pit to protect the bones from scavengers (Tooker 1964:139; Trigger 1969:111).

The Feast of the Dead was an opportunity to fulfill reciprocal obligations, renew friendships, resolve feuds, and redistribute wealth among villages and individuals (Axtell 1981:201; Donnelly 1975:40; Tooker 1964:139-140). The ceremony was an expensive part of the Huron cultural life that blended their religious beliefs with the reinforcement of social relationships and community cohesion (Ubelaker 1974:9).
CHAPTER 3: LITERATURE REVIEW OF FEMORAL ANATOMY AND CUTMARKS

Femoral Anatomy

The primary ossification of the femur occurs in the shaft and secondary ossification occurs in four epiphyseal centers in the distal epiphyses, head, greater trochanter, and lesser trochanter (Bass 1995:218-220). The epiphyses of the head, greater trochanter, and lesser trochanter fuse between ages 14 and 19. The distal epiphysis is the last to fuse. In females, the fusion occurs between age 14 and age 18. In males, fusion is complete between ages 18 and 22 (Bass 1995:220).

The thigh is one of the most heavily muscled areas of the adult body. The femur, correspondingly, “is the longest, heaviest, and strongest bone in the body” (White 2000:231). The femur is involved in all aspects of bipedal locomotion and can provide valuable information with regard to stature and sex (Bass 1995:229-232; White 2000:231). When a body is dismembered as part of a burial custom, cutmarks are frequently located in areas of heavy muscle attachments (Fernández-Jalvo et al. 1999:611). For the femur, theses include those muscles associated with the hip and the knee. The muscles of the thigh involved in the hip joint are listed in Table 3.1 and shown in Figures 3.1
through 3.4. The muscles of the thigh are listed in Table 3.2 and shown in Figures 3.1, 3.3, and 3.5.

**Table 3.1 Location of the muscles involved in the hip joint**
(adapted from Seeley et al. 1998, see their Table 11.18)

<table>
<thead>
<tr>
<th>Location</th>
<th>Muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>Iliopsoas (iliacus and psoas major)</td>
</tr>
<tr>
<td>Posterior and lateral</td>
<td>Gluteus maximus, gluteus minimus, gluteus minimus, and tensor fasciae</td>
</tr>
<tr>
<td>Deep thigh rotators</td>
<td>Gemellus (inferior and superior), obturator (externus and internus), piriformis, and quadratus femoris</td>
</tr>
</tbody>
</table>

**Table 3.2 Location of the muscles of the thigh**
(adapted from Seeley et al. 1998: see their Table 11.20)

<table>
<thead>
<tr>
<th>Location</th>
<th>Muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior compartment</td>
<td>Quadriceps femoris and sartorius</td>
</tr>
<tr>
<td>Medial compartment</td>
<td>Adductor brevis, adductor longus, adductor magnus, gracilis, and pectineus</td>
</tr>
<tr>
<td>Posterior compartment</td>
<td>Biceps femoris, semimembranosus, and semitendinosus</td>
</tr>
</tbody>
</table>
Figure 3.1 Anterior view of the superficial muscles of the hip and thigh (adapted from Seeley et al. 1998:343).

Figure 3.2 Posterior view of the superficial muscles of the hip (adapted from Seeley et al. 1998:343).
Figure 3.3 Anterior view of the deep muscles of the hip and thigh (adapted from Seeley et al. 1998:343).

Figure 3.4 Posterior view of the deep muscles of the hip (adapted from Seeley et al. 1998:343).
The cutmarks seen on bone that has been defleshed and disarticulated should correspond to the origin and insertion points of the above muscles on the femur.

**Cutmarks**

Historical information on the Feast of the Dead clearly indicates that the remains of the individuals buried during the ceremony were prepared by removal of any remaining soft tissue. Evidence of the removal of the tissue would have been left in the form of cutmarks on the bones.
The defleshing of remains by humans and their ancestors has a long history. The earliest evidence of defleshing predates 600,000 years ago (Pickering et al. 2000:583). The cutmarks left by defleshing activity have been observed on the skull of Stw 53, a possible *Australopithecus* specimen (Pickering et al. 2000), on the Bodo cranium, a *Homo erectus* or archaic *Homo sapiens* specimen (White 1986), and on the remains found at Gran Dolina TD6 in Sierra de Atapuerca, Spain, six specimens assigned to *Homo antecessor* (Fernández-Jalvo et al. 1999).

In more recent times, defleshing has been seen among groups other than the Iroquoian groups of the Great Lakes. Hoyme and Bass (1962:386) note, “the removal of flesh from the bones was a widespread practice in the Southeast and Middle Atlantic coast.” The ossuaries in the Southeast provide “perhaps the greatest time-depth for ossuaries as a burial practice” (Curry 1999:5). Sand mounds located throughout the Southeast of the United States date to the Middle Woodland, A.D. 200 to 900. In Florida, the sand mound burials were deposited prior to A.D. 100 (Curry 1999:5).

The differentiation of the cutmarks left by the people responsible for the preparation of the body and cutmarks that occurred due to natural taphonomic processes or by modern humans during excavation and storage is important.
Close examination of the marks in question can reveal if the morphology and placement of the marks is consistent with the defleshing process.

The cutmarks must show no evidence of healing. If healing is present, the cuts occurred before death. Damage caused by trampling, animal gnawing, or the abrasion of sediments can mimic cutmarks (Potts and Shipman 1981:577; Russell and LeMort 1986:321). Cutmarks caused around the time of death will have the same appearance as the bone surrounding it (Russell and LeMort 1986:320). Marks caused during excavation and storage may be eliminated because those marks will be cleaner and lighter in appearance as the newly exposed area has not been subject to the processes of weathering (Russell and LeMort 1986:320).

Cutmarks that are fine, linear and subparallel are consistent with human causation (Fernández-Jalvo et al. 1999:599-600; Hoyme and Bass 1962:381; Potts and Shipman 1981:577; White 1986:504; White and Toth 1989:365). Marks caused by the sharp tips and edges of steel knives and obsidian flakes closely follow the above pattern with some variation in the specific morphology visible under microscopic examination (Walker and Long 1977). Scrapes leave a slightly different pattern of mark. The damage “leaves a concentrated series of parallel and superficial
striations on a broad area” (Fernández-Jalvo et al. 1999:601). The scrapes tend to follow the long axis of the bone (Fernández-Jalvo et al. 1999:601). The location of the cutmarks on the skeletal elements is also important in the determination of the origin of the marks.
CHAPTER FOUR: MATERIALS AND METHODS

The femora from the Poole-Rose Ossuary had already been cleaned, sorted, and catalogued before this researcher began an examination of the collection. All bones present were examined and compared to the catalog listing for errors and to match any fragments that could be further reconstructed. Numbers that were not in the original catalog were added to the database. Any specimen numbers listed in the original catalog but not present on a specimen were eliminated from the working catalog. Homologous numbers, caused by the reconstruction of fragments, were identified and the lowest number present was used as the designator for the specimen with the other numbers noted. For example, the specimen designated as 0-11-53 also has 0-11-83 and 0-14-5 written on it, but the latter two numbers were not used to avoid an individual being counted twice. A total of 1,515 femoral specimens, both whole and fragmentary, were present in the collection. All data were entered into Excel and SPSS.

Several features were examined to determine the minimum number of individuals (MNI). The presence of more than 50 percent of zone one, as described below, was used to determine the MNI of the adult specimens. The MNI for the subadults was determined by the presence of the lesser
trochanter or the epiphyseal surface of the lesser
trochanter, in younger individuals.

Fragmentary specimens from adults were used in this study if the following criteria were met: 1) side must be
determined, 2) more than 50 percent of the feature being
examined must be present, and 3) the specimen must be
categorized as an adult. The subadult specimens were
examined to determine MNI and see if any cutmark damage was
present.

The catalog system for this collection provides the
spatial location of each specimen within the excavated
area. One-by-one meter units were used to excavate the
ossuary in levels (McKillop and Jackson 1991:10). The
number assigned to a specific specimen contains the
vertical unit and horizontal level in which the specimen
was found. For example, specimen number 7-23-19 was found
in unit 7, level 23. The last number, 19, is an assigned
number that indicates the specimen was the nineteenth bone
numbered from that unit and level. Some of the specimens
have a fourth subnumber in cases where two elements came
from the same place. The system was developed so that
spatial analysis of the elements could be completed. Some
units were excavated in bone layers. Other units have only
five levels, excavated in arbitrary 20-centimeter levels (McKillop, personal communication 2002).

All femora were divided into groups of right, left, or indeterminate side. The bones were further divided into adult or subadult. Adults are defined as those individuals showing fusion of the distal epiphysis, as discussed in the previous chapter.

The femora were examined for the presence of cutmarks indicative of the postmortem modifications associated with the Feast of the Dead as noted previously. Figure 4.1 shows the general locations of the three cutmark zones diagramed.

**Figure 4.1** Diagram of the left femur showing zones.

Measurements of maximum length and bicondylar (physiological) length were taken with an osteometric board. Maximum length was determined by placing the longer distal condyle against the fixed end of the board and the movable upright against the head of the femur. The head of the femur was then raised slightly and moved up and down and side-to-side to gain the maximum length. The bicondylar length was determined by placing the distal condyles flush with the fixed upright and sliding the moveable upright against the head.

The midshaft anterior-posterior (AP) and medio-lateral (ML) diameters and the maximum head diameter (MHD) were taken with sliding calipers by determining the midshaft on an osteometric board and taking the measurement in the appropriate anatomical direction. The midshaft circumference was taken using a flexible plastic tape measure at the location determined for the midshaft AP and ML diameters. The above measurements were taken for all whole adult femora in the method described by Bass (1995:223-224). Femoral MHD was also taken for the undamaged heads of all fragmentary bones that could be sided. The measurement was determined by using a sliding
caliper “on the periphery of the articular surface of the head” and turning the bone to find the maximum diameter (Bass 1995:225). In total, 165 complete femora, 81 left and 84 right, were measured. In addition, 158 left and 163 right femoral heads from fragmentary femora were also measured. The measurements for the MHD will be used to estimate sex of specimens in the collection as described by Bass (1995:229-232).

The femur is one of the most reliable estimators of sex. Several measurements of the femur may be used. MHD has shown, in previous studies, to be reliable (Bass 1995:232) and will be used for the purpose of this study. As previously discussed, ossuaries associated with the Feast of the Dead contain commingled remains. Therefore, no other associated skeletal elements can assist in the sex estimation of an individual. The problem with using any continuous trait to divide individuals into groups of male and female is that there will be overlap between the groups. To avoid placing an individual into the incorrect group, the following breakdown was used. Using the MHD of all femora that could be sided, the lower and upper quartiles were determined. The assumptions are that all individuals in the lower quartile are probable females and all individuals in the upper quartile are probable males.
The individuals in the middle range are considered to be a mixed group of larger females and smaller males. All femora that could not be sided were excluded to avoid including an individual twice. The mean values of the Poole-Rose ossuary for MHD and maximum length were compared to the means of other indigenous North American skeletal collections.

Several relationships related to relative size of the individual, evidence of postmortem modification, and the spatial location of the femora within the ossuary will be examined.

The first relationship examined was that of the presence of cutmarks in a zone, regardless of the relative size of a bone. Looking first at all left bones and then all right bones, the distribution of the cutmarks was examined to see if the occurrence of the cutmarks was random or if the cutmarks tended to occur more frequently in one or more of the three zones designated. Factors, like amount of soft tissue present, the stage of decay of the soft tissue, the size of the individual, and the skill of the person removing the tissue would all influence the number of cutmarks observed. There is no way to know how much soft tissue was present before the tissue was removed or what state of decomposition the tissue was in. There is
also no way to account for the skill of the person removing the tissue. The only factor that may be determined is the relative size of the individual.

Tests to examine the relationship between the occurrence of the cutmarks and the relative size and inferred sex of an individual were performed. Contingency table and Chi-square analyses were used to determine if the distribution of cutmarks on the femora of females was random across all three zones at $\alpha \leq 0.05$ level of significance. The same analysis was done comparing the male femora.

The last relationship examined the three zones of the femora to see if the presence or absence of cutmarks in a zone was random between smaller individuals and larger individuals. Again, contingency table and Chi-square analyses were performed for zone one, zone two, and zone three to determine if cutmarks occurred significantly more often among one or both sexes.
CHAPTER FIVE: RESULTS

The femora from the Poole-Rose ossuary provide important information about the population they represent. In this chapter, information on the minimum number of individuals, cutmarks, femoral measurements, sex estimation, and location of the cutmarks with regard to side and sex is detailed.

Minimum Number of Individuals

The minimum number of individuals (MNI) of the Poole-Rose ossuary, based upon the presence of zone two for the adult femora and the lesser trochanter of the subadults, is 300 individuals. Of the 300, 248 are adults and 52 are subadults. Compared to previous studies of the Poole-Rose ossuary, this is the second highest MNI. The highest MNI, 337 individuals, was based on the petrous portion of the right temporal bone as reported by Seidemann (1999). A complete list of the MNIs to date is reported in Table 5.1.

The differences in the MNI can be explained by several factors. These factors include loss of an element before interment in the ossuary, intentional inclusion and exclusion of particular elements, differential preservation of elements in the soil, loss during excavation, and loss during storage (Ubelaker 1974:33). Also influencing the MNI of the Poole-Rose ossuary is the fragmentary nature of
### Table 5.1 Reported MNI of the Poole-Rose ossuary

<table>
<thead>
<tr>
<th>Skeletal Element</th>
<th>MNI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrous portion of temporal bone (Seidemann 1999)</td>
<td>337</td>
</tr>
<tr>
<td>Femur</td>
<td>300</td>
</tr>
<tr>
<td>Humerus (Lundin 2000)</td>
<td>249</td>
</tr>
<tr>
<td>Ilium (Tague et al. 1998)</td>
<td>242</td>
</tr>
<tr>
<td>Ulna (Bodin 2002)</td>
<td>229</td>
</tr>
<tr>
<td>Radius (Parks 2002)</td>
<td>205</td>
</tr>
<tr>
<td>Second cervical vertebra (Dunne 1999)</td>
<td>204</td>
</tr>
<tr>
<td>Tibia (Bordelon 1997)</td>
<td>193</td>
</tr>
<tr>
<td>Supraorbital notch of crania (Smith 1997)</td>
<td>166</td>
</tr>
<tr>
<td>Metacarpal III (Kelly 2001)</td>
<td>145</td>
</tr>
</tbody>
</table>

the skeletal elements examined and the damage to diagnostic morphological features. Care taken during excavation to recover all fragments kept the risk of loss of elements to a minimum. Also, storage of the collection has been as meticulous as possible. McKillop and Jackson (1991:10) describe the overall condition of the ossuary upon excavation as “excellent.” But, when dealing with remains that are approximately 500 years old, some damage to the skeletal elements due to deterioration and handling of the bony structure is unavoidable.

The other main factor contributing to the variation in MNI is the intentional inclusion or exclusion of elements
during interment in the ossuary. Other researchers (Ubelaker 1974:37) have explored theories on why various elements are more likely to be included, but it is logical to expect larger and/or denser skeletal elements to have higher numbers. Given that the petrous portion of the temporal bone is the densest bone in the body and the femur is the largest bone in the body, the previously mentioned statement appears to be the case with the Poole-Rose ossuary. The MNI reported by Bordelon (1997:24) for the tibia is 193, more than one hundred less than the MNI determined by the femora. The tibia is the second largest bone in the leg and similar MNIs would be expected, but this is not the case. Bordelon (1997) used the nutrient foramen on the right tibia. It is possible that the difference may be explained by a combination of two factors, differential preservation of the nutrient foramen and the fact that Bordelon (1997) provides the MNI of adult individuals only.

**Cutmarks**

Identifying the elements with cutmarks and diagramming the cuts, as discussed in the previous chapter, began the analysis of the postmortem cultural modifications of those bones as part of the Feast of the Dead. The three zones, indicated by Figure 4.1, were chosen because of the general
pattern seen in the distribution of the cutmarks. As a rule, cutmark damage was located around the femoral neck (zone one), inferior to the greater trochanter, lesser trochanter, intertrochanteric line, and the intertrochanteric crest but superior to the mid-shaft (zone two), or inferior to the mid-shaft but superior to the distal epicondyles (zone three). Examples of typical cutmarks in the three zones are shown in Figures 5.1 through 5.7.

**Figure 5.1** Cutmarks (see red arrows) in zone one, posterior view of left femur 7-23-11.
Figure 5.2 Cutmarks (see red arrows) in zone one, anterior-superior view of left femur 1-23-617.

Figure 5.3 Cutmarks (see red arrows) in zone two, anterior-lateral view of left femur 2-23-684.
Figure 5.4 Cutmarks (see red arrows) in zone two, anterior view of right femur 12-99-39.

Figure 5.5 Cutmark (see red arrow) in zone three, posterior view of right femur 12-99-39.
Figure 5.6 Cutmarks (see red arrows) in zone three, anterior view of left femur 3-23-41.

Figure 5.7 Cutmarks (see red arrows) in zone three, posterior view of left femur 3-23-41.
The cultural explanation for the presence of the cutmarks is that the remains were cleaned. Any soft tissue remaining on the bones of the individuals was removed prior to interment during the Feast of the Dead. The presence of the cutmarks in the defined zones should be expected. The cutmark damage found in zone three would correspond to the severing of muscles of the thigh, listed in Table 3.2, that insert near or on the distal aspect of the femur. The presence of cutmarks in the area of zone two would correspond to the severing of muscles and tissue covering the hip joint. The tissues must be removed in order to access the very strong ligaments that maintain the integrity of the joint between the femoral head and the acetabulum of the innominate. The damage seen in zone one would be a result of the severing of the deep ligamentous attachments that hold the hip joint together. The only way to disarticulate the joint is to sever those tissues. The frequencies of the cutmarks in each zone are listed in Table 5.2 and Table 5.3. For the left femora, 10.17% of

### Table 5.2 Frequency and percentages of cutmarks per zone of the left femora

<table>
<thead>
<tr>
<th>Zone</th>
<th>Cutmarks Present</th>
<th>Cutmarks Absent</th>
<th>Total Zones</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18</td>
<td>159</td>
<td>177</td>
<td>10.17</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>204</td>
<td>243</td>
<td>16.05</td>
</tr>
<tr>
<td>3</td>
<td>33</td>
<td>173</td>
<td>206</td>
<td>16.02</td>
</tr>
</tbody>
</table>
Table 5.3 Frequency and percentages of cutmarks per zone of the right femora

<table>
<thead>
<tr>
<th>Zone</th>
<th>Cutmarks Present</th>
<th>Cutmarks Absent</th>
<th>Total Zones</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>167</td>
<td>184</td>
<td>9.24</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>220</td>
<td>248</td>
<td>11.29</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>178</td>
<td>207</td>
<td>14.0</td>
</tr>
</tbody>
</table>

zone one have cutmark damage, 16.05% of zone two have damage, and 16.02% of zone three have damage. For the right femora, 9.24% of bones with zone one present have cutmark damage, 11.29% of zone two have damage, and 14.0% of zone three have damage. Zones two and three of the left femora have the highest incidences of cutmarks at just over sixteen percent. Zone three of the right femora has the highest incidence of cutmarks at fourteen percent. Overall, approximately 30 percent of the femora have cutmarks.

Measurements of the Femur

Measurement of a skeletal element can provide much information about the individual. Six different measurements were taken on the femora from the ossuary. Though not all measurements were used in the final analysis, the summary statistics yielded by the measurements taken on the left and right femora described in the previous chapter are listed in Table 5.4.
Table 5.4 Summary statistics of femoral measurements (in mm)

<table>
<thead>
<tr>
<th>Left Femora</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Length (83)</td>
<td>447.9</td>
<td>451</td>
<td>107</td>
<td>392</td>
<td>499</td>
</tr>
<tr>
<td>Bicondylar Length (83)</td>
<td>442.4</td>
<td>444</td>
<td>112</td>
<td>384</td>
<td>496</td>
</tr>
<tr>
<td>AP¹ Diameter (83)</td>
<td>28.4</td>
<td>28</td>
<td>17</td>
<td>24</td>
<td>41</td>
</tr>
<tr>
<td>ML² Diameter (83)</td>
<td>257</td>
<td>26</td>
<td>9</td>
<td>21</td>
<td>30</td>
</tr>
<tr>
<td>Midshaft Circumference (83)</td>
<td>87</td>
<td>86</td>
<td>32</td>
<td>74</td>
<td>106</td>
</tr>
<tr>
<td>Maximum Head Diameter (160)</td>
<td>45.6</td>
<td>46</td>
<td>23</td>
<td>36</td>
<td>59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Right Femora</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Length (84)</td>
<td>445.4</td>
<td>447.5</td>
<td>104</td>
<td>389</td>
<td>493</td>
</tr>
<tr>
<td>Bicondylar Length (84)</td>
<td>440.7</td>
<td>442.5</td>
<td>106</td>
<td>382</td>
<td>488</td>
</tr>
<tr>
<td>AP¹ Diameter (84)</td>
<td>27.8</td>
<td>28</td>
<td>14</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>ML² Diameter (84)</td>
<td>24.4</td>
<td>25</td>
<td>10</td>
<td>19</td>
<td>29</td>
</tr>
<tr>
<td>Midshaft Circumference (84)</td>
<td>85.4</td>
<td>84</td>
<td>37</td>
<td>65</td>
<td>102</td>
</tr>
<tr>
<td>Maximum Head Diameter (163)</td>
<td>45.4</td>
<td>46</td>
<td>15</td>
<td>37</td>
<td>52</td>
</tr>
</tbody>
</table>

¹Anterior-posterior; ²Medio-lateral

Sex Estimates from the Femur

Sex estimation of the Poole-Rose population was carried out using the maximum head diameter from all femora that could be sided. A total of 160 left femoral heads and 163 right femoral heads were measured. Of the left femora, 46 (28.8%) are estimated to be female, 49 (30.6%) are estimated to be male, and 65 (40.6%) are mixed females and males. Of the right femora, 51 (31.3%) are estimated to be
female, 42 (25.8%) are estimated to be male, and 70 (42.9%) are mixed females and males (Table 5.5).

**Table 5.5 Females and males estimated from maximum head diameter of femora**

<table>
<thead>
<tr>
<th>Side</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females L</td>
<td>46</td>
<td>28.8</td>
</tr>
<tr>
<td>Females R</td>
<td>51</td>
<td>31.3</td>
</tr>
<tr>
<td>Mixed F/M L</td>
<td>65</td>
<td>40.6</td>
</tr>
<tr>
<td>Mixed F/M R</td>
<td>70</td>
<td>42.9</td>
</tr>
<tr>
<td>Males L</td>
<td>49</td>
<td>30.6</td>
</tr>
<tr>
<td>Males R</td>
<td>42</td>
<td>25.8</td>
</tr>
</tbody>
</table>

**Comparison of Femoral Measurements with Other Native Groups**

The Huron people are described historically as being tall, robust people (Trigger 1969:7). The mean measurements of the maximum length and the maximum head diameter of the femora from the ossuary are compared to those of other indigenous North American skeletal samples (Table 5.6 and Table 5.7).
Table 5.6 Comparison of the mean maximum length (ML) of femora for males and females from the Poole-Rose ossuary with other native groups (in mm)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sex</th>
<th>Side</th>
<th>N</th>
<th>ML Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poole-Rose</td>
<td>M</td>
<td>L</td>
<td>32</td>
<td>466.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>24</td>
<td>462.83</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>L</td>
<td>20</td>
<td>420.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>25</td>
<td>425.48</td>
</tr>
<tr>
<td>Tabor Hill¹</td>
<td>M</td>
<td>L</td>
<td>12</td>
<td>450.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>15</td>
<td>451.40</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>L</td>
<td>12</td>
<td>433.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>22</td>
<td>429.00</td>
</tr>
<tr>
<td>Kleinburg²</td>
<td>M</td>
<td>L</td>
<td>41</td>
<td>450.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>33</td>
<td>453.12</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>L</td>
<td>39</td>
<td>427.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>33</td>
<td>433.12</td>
</tr>
<tr>
<td>Georgia Pre-Ag³</td>
<td>M</td>
<td></td>
<td>9</td>
<td>449.00</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td></td>
<td>19</td>
<td>434.00</td>
</tr>
<tr>
<td>Georgia Ag³</td>
<td>M</td>
<td></td>
<td>47</td>
<td>448.00</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td></td>
<td>54</td>
<td>416.00</td>
</tr>
<tr>
<td>Tollifero⁴</td>
<td>M</td>
<td>L</td>
<td>11</td>
<td>440.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>7</td>
<td>435.30</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>L</td>
<td>2</td>
<td>426.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>2</td>
<td>428.00</td>
</tr>
<tr>
<td>Clarksville⁴</td>
<td>M</td>
<td>L</td>
<td>13</td>
<td>460.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>13</td>
<td>456.80</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>L</td>
<td>7</td>
<td>423.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>7</td>
<td>427.10</td>
</tr>
</tbody>
</table>

¹Churcher and Kenyon 1960; ²Pfeiffer 1979; ³Larsen 1981; ⁴Hoyme 1962
Table 5.7 Comparison of the mean maximum head diameter (MHD) of femora for males and females from the Poole-Rose ossuary with other native groups (in mm)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sex</th>
<th>Side</th>
<th>N</th>
<th>MHD</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poole-Rose M</td>
<td>L</td>
<td>49</td>
<td>49.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>42</td>
<td>49.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F L 46</td>
<td></td>
<td></td>
<td>41.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>51</td>
<td>41.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tabor Hill¹ M</td>
<td>L</td>
<td>12</td>
<td>46.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>16</td>
<td>47.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F L 14</td>
<td></td>
<td></td>
<td>42.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>20</td>
<td>42.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kleinburg² M</td>
<td>L</td>
<td>43</td>
<td>45.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>38</td>
<td>47.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F L 46</td>
<td></td>
<td></td>
<td>41.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>34</td>
<td>43.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia Pre-Agricultural Sample³ M</td>
<td>14</td>
<td>45.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>31</td>
<td>41.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia Agricultural Sample³ M</td>
<td>58</td>
<td>43.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>61</td>
<td>39.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Churcher and Kenyon 1960; ²Pfeiffer 1979; ³Larsen 1981

Cutmarks by Left or Right Side

The presence of cutmarks on the femora was influenced by several factors, as discussed in the previous chapter. Among all left femora, Chi-square analysis showed the presence of cutmarks to be random across all three zones, p=0.33. Among all right femora, the same result was seen, p=0.17. The observed and expected values for each analysis are displayed in Tables 5.8 and 5.9.
Table 5.8 Observed (left table) and expected (right table) values of cutmarks in all zones for the left femora

<table>
<thead>
<tr>
<th>Zone 1</th>
<th>Present</th>
<th>Absent</th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone1</td>
<td>18</td>
<td>159</td>
<td>177</td>
<td></td>
</tr>
<tr>
<td>Zone2</td>
<td>39</td>
<td>204</td>
<td>243</td>
<td></td>
</tr>
<tr>
<td>Zone3</td>
<td>33</td>
<td>173</td>
<td>206</td>
<td></td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>536</td>
<td>626</td>
<td></td>
</tr>
<tr>
<td>Zone 1</td>
<td>25.45</td>
<td>151.55</td>
<td>177</td>
<td></td>
</tr>
<tr>
<td>Zone 2</td>
<td>34.94</td>
<td>208.06</td>
<td>243</td>
<td></td>
</tr>
<tr>
<td>Zone 3</td>
<td>29.62</td>
<td>176.38</td>
<td>206</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.9 Observed (left table) and expected (right table) values of cutmarks in all zones for the right femora

<table>
<thead>
<tr>
<th>Zone 1</th>
<th>Present</th>
<th>Absent</th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone1</td>
<td>17</td>
<td>167</td>
<td>184</td>
<td></td>
</tr>
<tr>
<td>Zone2</td>
<td>28</td>
<td>220</td>
<td>248</td>
<td></td>
</tr>
<tr>
<td>Zone3</td>
<td>29</td>
<td>178</td>
<td>207</td>
<td></td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>565</td>
<td>639</td>
<td></td>
</tr>
<tr>
<td>Zone 1</td>
<td>21.31</td>
<td>162.7</td>
<td>184</td>
<td></td>
</tr>
<tr>
<td>Zone 2</td>
<td>28.72</td>
<td>219.28</td>
<td>248</td>
<td></td>
</tr>
<tr>
<td>Zone 3</td>
<td>23.97</td>
<td>183.03</td>
<td>207</td>
<td></td>
</tr>
</tbody>
</table>

Location of Cutmarks on the Femur by Sex

The next test performed was to see if the estimated sex of the individual influenced the occurrence of cutmarks across all zones of the femur. Using the previously described samples of estimated females and males, each bone zone was compared to see if the occurrence of cutmarks in a particular part of the bone was related to the sex of the individual. For zone one, Chi-square analysis showed no significant relationship between the occurrence of cutmarks for males and females in zone one, p=0.91. The same was found for zones two and three, p=0.33 and p=0.63, respectively. The observed and expected values for each analysis are displayed in Tables 5.10, 5.11, and 5.12.
Table 5.10 Observed (left table) and expected (right table) values of cutmarks in zone one for males and females

<table>
<thead>
<tr>
<th></th>
<th>Present</th>
<th>Absent</th>
<th></th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>6</td>
<td>40</td>
<td>46</td>
<td>5.82</td>
<td>40.18</td>
</tr>
<tr>
<td>Males</td>
<td>5</td>
<td>36</td>
<td>41</td>
<td>5.18</td>
<td>35.82</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>76</td>
<td>87</td>
<td>11</td>
<td>76</td>
</tr>
</tbody>
</table>

Table 5.11 Observed (left table) and expected (right table) values of cutmarks in zone two for males and females

<table>
<thead>
<tr>
<th></th>
<th>Present</th>
<th>Absent</th>
<th></th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>11</td>
<td>34</td>
<td>45</td>
<td>9.22</td>
<td>35.78</td>
</tr>
<tr>
<td>Males</td>
<td>6</td>
<td>32</td>
<td>38</td>
<td>7.78</td>
<td>30.22</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>66</td>
<td>83</td>
<td>17</td>
<td>66</td>
</tr>
</tbody>
</table>

Table 5.12 Observed (left table) and expected (right table) values of cutmarks in zone three for males and females

<table>
<thead>
<tr>
<th></th>
<th>Present</th>
<th>Absent</th>
<th></th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>8</td>
<td>33</td>
<td>41</td>
<td>8.86</td>
<td>32.14</td>
</tr>
<tr>
<td>Males</td>
<td>8</td>
<td>25</td>
<td>33</td>
<td>7.14</td>
<td>25.86</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>58</td>
<td>74</td>
<td>16</td>
<td>58</td>
</tr>
</tbody>
</table>
CHAPTER SIX: DISCUSSION AND CONCLUSIONS

Ossuaries present the opportunity to study a group of related individuals who died within a relatively known amount of time. Demographic information gained through the study of ossuaries provides a small window to the time in which the people lived. Ossuaries recovered from the Great Lakes region also provide the opportunity to examine a unique burial practice associated with the Iroquoian-speaking groups that inhabited the region prior to European contact. The Poole-Rose ossuary is a Late Woodland burial, located in southern Ontario, Canada, that dates to A.D. 1550 ±50. Though the burial is outside of the region traditionally known as “Huronia,” the burial is consistent with the Huron mortuary ritual known as the Feast of the Dead.

Using the minimum number of individuals (MNI), there were at least 300 individuals buried in the ossuary. Only Seidemann (1999) reported more people were buried in the ossuary, on the basis of an MNI of 337 using the petrous portion of the temporal bone.

The Poole-Rose people were tall and robust. The comparison of the mean maximum length of the femur and the mean maximum head diameter with other native North American and Canadian groups indicates the Poole-Rose people were
indeed robust. The muscle attachments of the femora, overall, are very robust compared to modern populations.

The evidence of cutmarks found on the femora of the Poole-Rose ossuary is consistent with the cultural accounts of the Feast of the Dead. The femora from all adults buried in the ossuary were examined for evidence of cutmarks. The cutmarks generally occur in three zones. However, the occurrence of cutmarks on a specific bone is random and not sex specific. The random location of the cutmarks can be explained by the fact that not all individuals interred within the ossuary required removal of soft tissue. In addition, some cutmarks may not be evident due to deterioration of the bone surface after the individual was interred. Cutmarks seen around the neck of the femur (zone one) correspond with the removal of the deep musculature of the hip. Damage seen in zone two (around the proximal end of the shaft) was caused by the removal of the superficial muscles of the hip and upper thigh to gain access to the hip joint. Finally, the severing of the thigh muscles that insert on the distal end of the shaft in order to remove the large thigh muscles and disarticulate the knee would cause the damage seen in zone three. Of the adults of the Poole-Rose ossuary,
approximately 16% have cutmarks present, based on the analysis of the femora.

The evidence of postmortem cultural modification and the deposition of the femora within the ossuary are consistent with Brébeuf’s account of the Feast of the Dead. The occurrence of cutmarks in the three general areas of the femur shows the process of removing soft tissue as deliberate and careful. This precision demonstrates the importance of the ritual in the final disposition of the body and soul of the individuals placed in the ossuary.

Though individuals cannot be reconstructed from such a burial tradition, careful analysis of the individual elements recovered from an ossuary, like Poole-Rose, can provide useful insight into the biological and cultural history of ancient peoples.
REFERENCES


Verano JW, and Ubelaker DH (1992) Disease and Demography in the

Walker PL, and Long JC (1977) An Experimental Study of the
Morphological Characteristics of Tool Marks. American
Antiquity 42(4): 605-616.


White TD (1986) Cut Marks on the Bodo Cranium: A Case of
Prehistoric Defleshing. American Journal of Physical
Anthropology 69: 503-509.

Press.

Ancient Cutmarks. American Journal of Physical Anthropology
78: 361-367.
Lori Kay Schiess was born in Driggs, Idaho, on January 30, 1976. She graduated from Idaho State University in 1999 with a Bachelor of Arts in Anthropology. She will pursue a doctoral degree in anthropology at Michigan State University starting in the fall of 2002.