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The Bioarchaeology of Dissection and Autopsy in the United States

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Foreword

This volume is extraordinary in that the chapters are focused on historical moments when medical schools and the medical profession began obtaining and using cadavers for dissection and conducting autopsies in the United States in the 1800s. What makes this body of work unique is that the interpretations and understandings are gained through the lens of modern bioarchaeological (and forensic) data derived from the analysis of skeletonized remains from those who were autopsied or dissected in these early years. From historical documents, we know when various policies, rules, and regulations began being established in different states for their medical schools and facilities, but only the analysis of the skeletal remains provides what historical documents never can and that is the lived experiences and circumstances of those whose bodies ended up being used as teaching materials (dissection) and resources to learn about disease processes (autopsy).

If the reader only reads the introductory and concluding chapters by Nystrom, they would have a truly good working knowledge about what we know thus far from the study of these skeletal collections. But the case studies are so richly detailed, so carefully laid out, and so engagingly presented, it is doubtful that any reader will stop with the Introduction. Each section of the book, and the chapters within sections, all shine a different kind of light on these practices. Starting with what we know from the earliest colonial times about notions of anatomy and the body, several chapters provide engrossing examinations into colonial dissections and autopsies. While evidence from public cemeteries is less forthcoming, the overview of this area and the one chapter that does delve into the topic provide the reader with a very good foundation for the kinds of research being produced from these contexts. The largest part of the volume deals with evidence from Medical Institutions and from Almshouse Cemeteries. Here we see a burgeoning of case studies that reveal the political-economic forces that made some dead bodies more easily obtainable for dissection and autopsy than others.

This volume pushes historical bioarchaeology into new methodological and theoretical areas. Methodologically, being able to distinguish between bones that have been autopsied and dissected, and those that have been treated with care and those that have been ill treated, is all a part of the analytical tool kit. The standard arsenal of techniques for reconstructing the lived experiences of the individuals in these collections is applied with rigor and innovation. The collective body of theories used by authors aided in piecing together the nature of the institutions and regulating bodies that promoted a kind of violence toward the dead as they were strategically targeted for dissection, autopsy, or other kinds of postmortem uses.

This is a fascinating collection of studies that provides insight into the ways that institutionalized violence and the implementation of various kinds of policies, rules, and laws manifest in poor health and early death for vulnerable individuals who are denied access to necessary resources. These chapters also demonstrate the culturally sanctioned ways that the uncared-for and unprotected dead is also subject to mistreatment.

Bioarchaeology is an exciting, innovative, and relevant subdiscipline of anthropology and it is experiencing a fluorescence of application that has never been seen before. Bioarchaeologists such as those who authored the chapters in this book are producing a body of scholarship that demonstrates the relevance of this kind of work for not only the unknown ancient past but also for, in this case, the known historical documentation of practices surrounding institutions of higher education that at times promoted unethical uses of the dead bodies of the poor and disenfranchised. The skeletal data, combined with other lines of evidence, is producing a far more accurate, nuanced, and variable narrative of not only these practices but documentation and "witnessing" for those who fell victim to becoming individuals in these collections.

Las Vegas, NV Debra L. Martin

Foreword II: The Afterlife of Death

"…it makes a difference how we die! Men should not allow themselves to say or even think it [does] not."

– Samuel Hayes Elliot, *New England's Chattels*: *or*, *Life in the Northern Poor-house* (New York, 1858), 299

Once upon a time, say in nineteenth- and early twentieth-century America, Death had a capital D and served a moral purpose. Take, for example, an American Tract Society pamphlet, published around the year 1825, that preached what was then a familiar trope of Christian and sentimental discourse: "Death spares neither age nor rank, talent, nor piety…"[1] Death, it was argued, is an equalizer, levels hierarchies, and takes people up and down the social scale. But Death also singled out some people for special treatment. The truly good—those with the clearest of consciences—could gracefully surrender, welcome the end—an imitation of Christ. Sinners could also redeem themselves with sincere repentance and surrender. But not so the dying libertine, speaking from his deathbed, coffin, and then grave: "I am expiring on soft and downy Pillows, and I am respectfully attended by my Servants and Physicians.... alas! Who can bail me from the Arrests of Death? Who will descend into the dark Prison of the Grave, to relieve me there, or defend me from Corruption? Here they all leave me, after having paid a few idle Ceremonies to the breathless Carcass…"[2] In his soliloquy (printed in a broadsheet, *ca.* 1800), Death was figured as a terrible punishment and the decomposing body was itself a kind of hell. Unless you were one of those pure hearts who were going to heaven. In which case, fear not, what happened to your physical body was of no consequence at all.

[1] *I want to thank the Intramural Research Program of the National Institutes of Health, National Library of Medicine, and Jeffrey Reznick for supporting my work on this foreword.*

The Village Funeral (New York: American Tract Society, 36, c. 1825–27) [American Antiquarian Society] takes the form of a story which contrasts the simple and heartfelt funeral of the virtuous Mrs. Allen, a poor elderly farmer's wife, with the showy insincere funerary "pageantry" of upper-class city folk.

[2] *From a Dying Libertine to His Friend, Together with the Dying Words of a Young Man* (n.p., c. 1790–1810) [American Antiquarian Society broadside].

Those sentiments were commonplace. And yet, in the everyday business of death, people acted as if the disposition of bodies was of momentous consequence. Eulogies, inscriptions, consolatory poems, fiction, popular songs, etc., made out death to be sleep and the grave a bed, a resting place. The living should take care not to disturb that sleep. The respect and honor you receive in death, it was thought, should match or exceed the respect and honor you received in life. But that took a lot of work: energy and resources. There were death rituals: the washing and laying out of the body, the wake, funeral services, processions. And death goods: coffins (ranging from simple pine boxes to elaborate caskets with fancy brass plates); shrouds; widows weeds and mourning gloves; postmortem photographs; printed obituaries and memoirs; haircuttings in fancy lockets, containers and cases; and so on. What happened to a dead body mattered a lot, to individuals contemplating their own demise, as well as family, friends, and the surrounding community. People were judged on the merits of their death performances as they were judged on the merits of their life.

In metaphor, the grave could be either a "loving home" or a "dark Prison." But there were living persons who occupied very uncomfortable homes or no homes at all, who were incarcerated in real prisons and jails, asylums, poorhouses, and hospitals. Often enough, they expired while in the "care" of those institutions, and not on any "soft and downy Pillows." They were buried in mass graves, or in simple unstained pine coffins, maybe outfitted with a plain brass plate, but more often no plate at all. All of which was of great concern.

So there was death metaphor and narrative and performance. And there was personhood: Death was full of persons. The 1858 sentimental novel, *New England's Chattels: or, Life in the Northern Poor-house* (written by a Congregationalist minister Samuel Hayes Elliot as a call to reform the rural poorhouse system), was full of dying persons.[3] We have already mentioned the dying libertine, but there were also the virtuous pauper, the drunkard, the harlot, the good Samaritan, the ruffian, the child innocent, the unbalanced poet, and the faithful wife, a succession of moral types. The readers of *New England's Chattels* were predisposed to understand—from long literary and theatrical experience as well as the continual round of deathbed vigils, wakes, and funerals—that Death fixes personal and social identity and status. Death is the crux of the moral narrative of a life, even as it extinguishes us, strips us of agency and then identity. That contradiction troubled everyone: the visible markers of a life, all of the hard work that it takes to make a person, inevitably erode. Until we are nothing.

Elliot's novel was a collection of moral tales about death and dying. Its main protagonists were the poor, who were terribly mistreated in death as in life by their social betters. They died in difficult circumstances, but their humble virtue and patient suffering were an imitation of Christ that redeemed everyone around them—and by extension Elliot's readers. The tormentors of the poor were a mixed bag of sadists and hypocrites: overseers and local officials who administered and callously

[3] Samuel Hayes Elliot, *New England's Chattels*: *or*, *Life in the Northern Poor-house* (New York, 1858).

profited from the poorhouse system, and who smugly approved of the suffering they inflicted; morally obtuse upper-class ladies and gentlemen who made a pretense of piety and charity, as long as it caused no inconvenience to them; doctors and medical students who eagerly appropriated the bodies of the poor for their dissecting tables and museums, and took unseemly pleasure in their anatomical work. These pillars of the community claimed to be good Christians, but they lacked the Christian virtue and habit of empathy.

Empathy was key. In Elliot's novel, as in *Uncle Tom's Cabin* and other contemporary sentimental fictions, "heartfelt" sensitivity to the suffering of others, and a selfless commitment to alleviate suffering, made a moral distinction—society was divided into *human* (or *humane*) and *inhuman(e)*. The cultivation of empathic feeling, carried on by a small group of "humanitarian" middle- and upper-class reformers, was the foundational practice of a universalist, democratic creed, based on a universalist identity category—*humanity*. The narratives staged in *New England's Chattels* perform an ethos: we become human through imaginative identification with, and sympathy for, others, especially those who cannot take care of themselves. Otherwise we are brutes. Empathy, then, was not only an ethical practice. It was the cognitive practice upon which the entire genre of the novel was founded: the reader's imaginative identification with fictional characters.

This cultural politics especially played out in performances relating to death. Death was almost a test case. The dead were the ultimate victims, entirely helpless, dependent on the kindness of the living, yet utterly alien, contaminated, and buried away from human intercourse. A deep moral sympathy with the dead could only signify that one possessed a highly cultivated ability to empathically identify. The dead live on in our cultural imagination and dead lives matter. Thus, at the conclusion of *New England's Chattels*, when the poor but virtuous "widow Prescott" dies—and after the old poorhouse has finally been abolished and a new reformed system implemented—the humanitarian narrator celebrates this happy funerary ending:

> Every one of the paupers who was able went to her grave and saw her buried. This was a whole new thing to them. They began to see the difference in their condition, even at funerals; and being dressed like other people, they were not ashamed to walk among the graves, to answer questions, and to speak to those who accosted them. They could not avoid thinking it was a handsome thing to be decently buried; to see a good many people at your grave—i.e., at your companion's grave; to be thought a human being worthy of a burial notice, and perhaps a marble slab in memory of one, as at least belonging to the great race—the HUMAN people. [473]

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More than 150 years have elapsed since Elliot wrote his novel, and some things don't change. We still die. We still moralize death (even if we no longer retain the capital D) and still tell death stories. But some things do change. Casts of characters, institutional structures, rituals, genres, technologies, cultural values, and the demographics of mortality. People don't die as frequently or as young. The ontological, theological, narratological, and affective underpinnings of death have shifted. Death matters less and has become medicalized, professionalized, institutionalized, commercialized, routinized, and regulated. We perform death according to mandated protocols and a menu of consumer legal, ethnic, aesthetic, religious choices. We don't model our funerals on death scenes in novels and poems. We are not judged (much) on the sincerity and quality of our funerary ceremonies, the elegance of the disposition of our corpses, the performance of grief at the funeral and cemetery, and the provision of funerary meals and goods. Instead we turn outward and judge (or rate) institutions, commercial providers, doctors, medical technologies, and laws.

So everything is different than it was. Yet we also look for meaning in death, use death to make meaning. Founded in a *longue durée* of death practices, those meanings are so pervasive that we often can't see that they have a history. Our semiosis especially centers on the universalist identity category of the *human* and corollary obligations to honor, and enter into communion with, fellow human beings—especially those who are defenseless, discriminated against, and suffer from structural and personal acts of violence. Shorn of Christian apologetics and the dramaturgy of sentimental narrative, those obligations are embedded in our ethical codes. We take them seriously, even with respect to the dead. And even though secular morality and law don't credit the dead with any metaphysical life or powers.

This volume focuses on two intersecting death practices—autopsy and dissection. In the present moment, the epistemological authority of anatomical and forensic science is very strong. Even if we know that some particular method or technology may be unreliable, we have faith in the power of scientific instruments and techniques developed over the centuries—forged through systems of experimentation, peer presentation, review, critique, and legal challenge—to describe and analyze dead bodies and remains (in situ and in the laboratory). We are persuaded that forensic science can reliably determine time and cause of death, evidence of diet and the conditions of life, mental states, growth patterns, postmortem treatment, and so on. The anatomist, autopsyist, physical anthropologist, and medical examiner are trained to focus intensively, methodically on their subject materials and to suppress emotional attachment with the subject under investigation. We rely on them to be rigorously objective—and are disappointed, even shocked, if they are not.

A third cultural practice is the historical method, which combines empathic reconstruction with a moral commitment to truth telling, and an epistemological commitment to objectivity and methodological rigor. Historians are trained to study change over time. But change over time affects the historian, the anatomist, and the humanitarian as well as their subject matter. Viewed from a historical perspective, it is readily apparent that the aspiration to universalism is always parochial, always bound by time and place. The aspiration to disinterested objectivity is always tinged by interest, including the desire to touch and see and possess, all of which are conditioned by time-bound, local cultural practices. No historian, no anatomist, is exempt.

We can't manage to be pure, but empathy, objectivity, and historicity are precious cultural accomplishments. They move us and motivate the field of bioarchaeology, a disciplinary domain which has expanded enormously over the past few decades in the sophistication of its techniques and scope of study (from the prehistorical past to the present). Bioarchaeology's ethical commitments are deeply connected to the concepts of personhood that Elliot placed at the center of *New England's Chattels*. This volume—which focuses on human remains and related objects found at or near the sites of poorhouses, hospitals, medical schools, and early colonial settlements, and all of which focus on the evidence of postmortem dissection and autopsy—is a sequel to that fictional polemic. Explicitly and implicitly, its articles avow a moral commitment to truth telling, social justice, and "bioethics" (a word only coined in 1978). In other words, in unearthing and analyzing the dead, in searching for evidence of ante- and postmortem medical treatment and maltreatment, the bioarchaeologist contributes to a restorative culture of "human rights"—respect for individual persons and their social, cultural, and physical differences and commonalities, "informed consent," transparent decision-making, sensitivity to the wrongs visited on the poor, people of color, immigrants, women, indigenous peoples, sexual minorities, etc.

Yet, paradoxically, the bioarchaeologist's dispassionate, analytical methodology, technical vocabulary, and abilities—and (unacknowledged) pleasure in working with human remains and inventorying and categorizing the parts—come directly out of the anatomical enterprise that Elliot so strongly condemned for playing with the bodies of the dead, disregarding the funerary honor of the poor. Bioarchaeologists, like nineteenth-century anatomists (and other scientists), choose to work on human remains. They also are motivated by the pleasures of that work, which can never be entirely detached from the mysteries, the aura, of death. Let's say it explicitly: it may be hard to justify, but at some level it's fun, even a joy, to cull the wreckage of bodies and materials, to salvage shards of personhood, so that we can snoop around in and reconstruct lives and scenes.

Of course, even in life, it took a lot of work to make a person with an identity and a scope of action. Personhood was only by convention a given—a hard fact that became all too clear revealed when death and time strip it away. It took even more work to perpetuate personhood in death—work that was often further obstructed by obtuseness and indifference, sometimes by deliberate action. This book, testimony to hard lives, ill treatments, and difficult deaths, tries to retrospectively redress those wrongs, by unearthing, documenting, and narrating the evidence of how doctors and institutions often aided and abetted the stripping away of identity, but sometimes tried to preserve or expand identity by making autopsies that provided details for legal and medical cases.

Those whose bodies fall now to us, bodies unearthed by highway and building construction or by funded archaeological excavations, would probably never have consented to the dissection of their bodies and display of their remains in publications and museums—maybe not even consented to this book which you, dear reader, are holding in your hand (or reading on a screen). We can live with the paradox. The articles of this volume, compassionate and rigorously scientific post-postmortem death performances, honor the dead and inform the living. They are moral tales for our time.

Washington, DC Michael Sappol

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Kenneth C. Nystrom is an Associate Professor in the Department of Anthropology at the State University of New York at New Paltz, USA. He received his B.A. from the University of Minnesota-Duluth (1997) and his M.S. (1999) and Ph.D. (2005) from the University of New Mexico. He would characterize himself as a broadly trained bioarchaeologist. His early research focused on the Chachapoya of northern Perú where he investigated a range of topics including the reconstruction of mortuary behavior based on paleoentomology, trepanation and trauma, and the impact of Inca conquest on site-specific and regional-level genetic homogeneity using craniometrics. He has also conducted research on long-bone cross-sectional geometry in early classic elites from Copan, Honduras, and postmarital residence patterns among the Chiribaya of southern Perú utilizing craniometrics. His current focus is on African American and almshouse cemeteries from the nineteenth and twentieth centuries in the United States. He grounds his research in the understanding that the biological and social world in which we live is incorporated into and onto our bodies. From this perspective he has examined dental health, trauma, and sex-specific post-manumission migration using strontium isotopes in a historic African American cemetery from New York. Additionally, he considered how the postmortem examination of a young woman from this cemetery can inform on our understanding of how social identity of African Americans was constructed during the nineteenth century. He is currently analyzing evidence of dissection and surgical experimentation from the Erie County Poorhouse from this same perspective.

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Chapter 1
Introduction

Kenneth C. Nystrom

There is a voluminous literature on the history of anatomy, dissection, and autopsy both within the United States and abroad (Allen 1976; Blessing et al. 2012; Buklijas 2008; Elizondo-Omaña et al. 2005; Halperin 2007; Hildebrandt 2008, 2009a, b, 2010; Highet 2005; Hulkower 2011; Humphrey 1973; Martensen 1992; Persuad 1997; Richardson 1987; Sappol 2002; Schultz 1992). While some of this research focuses on the development of the medical profession (e.g., Elizondo-Omaña et al. 2005; Garment et al. 2007; Tward and Patterson 2002), much of it is also considers the social history of the interaction between economics, race and class politics, and anatomy. In 1987, Ruth Richardson produced what is widely cited as the seminal work on the social history of dissection by examining the sociopolitical and economic variables that influenced the development and implementation of the 1832 Anatomy Act in the United Kingdom. Richardson's analysis is grounded in an understanding of traditional cultural and religious perception of the body and in particular the persistent belief that the dead body retains some vital power: "… for after death the body possessed powers the living person never had, and commanded awe, even fear, when the living individual never may have done so" (Richardson 1987: 17). The powerful dead body thus requires appropriate funerary rights because the manner in which the dead are treated impacts "… the future repose of the soul and the comfort of the mourners" (Richardson 1987: 17). She felt that the postmortem fate of the body, if it is mistreated or violated, reflects that state of the soul.

Within the United Kingdom and the United States, dissection for the purpose of anatomical study initially came to be associated with violation and transgression. In a pivotal series of royal decrees, dissection became linked with capital punishment in the early sixteenth century. In 1506 James IV allowed the Edinburgh Guild of Surgeons

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and Barbers to dissect the bodies of executed criminals. In 1540, Henry VIII granted the newly chartered company of Barbers and Surgeons the bodies of four (and then six) executed criminals per year. These grants represent the "inception in Britain of a relationship between the medical profession, the ruling elite and the judiciary on the one hand, and between dissection and exemplary punishment on the other" (Richardson 1987: 32). In 1752, judges were given the power to sentence murderers to be dissected as an alternative to hanging in chains. In effect, by casting dissection as a form of punishment, doctors and anatomists became agents of the judiciary.

While the social history of the development of the medical profession, anatomy, and dissection in the United States mirrors the United Kingdom, race also features centrally in the development of anatomy within the former country. This history of the exploitation of African Americans and other racialized minorities by the medical profession is well established (e.g., Kaufman 1979; Washington 2006; Savitt 1982) and a number of authors have documented how these groups were targeted as sources of anatomical specimens for medical school dissection rooms (e.g., Halperin 2007; Humphrey 1973).

Despite the complexity and depth of the historical literature on this topic, bioarchaeological contributions, until much more recently, have been infrequent and scattered. Research on the skeletal evidence of postmortem examination can be grouped into three broad categories; descriptive/paleopathological, medical historical, and social bioarchaeology/biocultural. While these categories are not mutually exclusive, to date the majority of research has fallen into the first two categories. More recently, some researchers, while continuing to ground their analyses within the historical framework of the development of the medical profession, are also contextualizing and interpreting their work using various social theory frameworks to be able to link the skeletons with broader cultural and historical processes.

Some research seeks to link the evidence of dissection or autopsy to an underlying medical condition or pathology. Lawrence Angel and colleagues (1987: 224) briefly discuss the craniotomy of a single adult female recovered from the Eighth Street First African Baptist Cemetery in Philadelphia: Pennsylvania: "One female has very marked hyperostosis frontalis interna, an endocranial neurological disorder, which probably led to her autopsy." Similarly, Molleson and Cox (1993: 88–89) consider what pathological disorders may have prompted the autopsy of seven individuals recovered from Christ Church, Spitalfields: "In one case (2154) the cranium had been cut open and the laminae of the vertebrae had been cut to remove the spinal cord. This skeleton was of a young female and there were no pathological changes which might have explained the reason for this autopsy, although it is possible that she might have had a tumour of the spinal cord which caused her death." Interpretation of the other individuals follows a similar vein: "As with all of the other cases, there was nothing in their skeletons to indicate the reason for the postmortem examination" (Molleson and Cox 1993: 89). While this more descriptive approach remains a common feature of research today it is usually not the primary focus (e.g., Nystrom 2011).

The majority of research on the skeletal evidence of postmortem examination has considered it in relation to the development of anatomy, the medical profession and education. In one of the earliest examples of scholarly research on the topic, Waldron and Rogers (1988: 127) suggest that "[t]he study of evidence of surgery and post-mortem examination in bones from archaeological sites is a relatively minor, but nevertheless, important aspect of paleopathology." The authors go on to link research on postmortem examinations to medical history: "Evidence of autopsies from securely dated sites will help establish when this investigation became established and whether this was different in different place" (Waldron and Rogers 1988: 127). This medical historical perspective is evident in a number of publications from Great Britain (Anderson 2002; Boston et al. 2005, 2009; Brickley et al. 1999, 2001; Chapman 1997; Hillson et al. 1998; Hull et al. 2003; Henderson et al. 1996; Miles et al. 2008; Mitchell et al. 2011; Western and Bekvalac 2015), Canada (Pfeiffer et al. 1989), Poland (Bugaj et al. 2013), France (Signoli et al. 1997; Valentin and d'Errico 1995), and Western Europe (Charlier et al. 2013). Indeed, a recent edited volume (Mitchell 2012) that synthesized much of the skeletal evidence from Britain was produced for a publication series called *The History of Medicine in Context*.

Within the United States, many of the first bioarchaeologcial investigations of postmortem examination were also principally focused on medical history. Mann and colleague's (1991: 106) analysis of skeletal remains recovered from the privy of Dr. Frank Thompson, a nineteenth century physician from Annapolis, Maryland, describes how "[t]he bones offer insight into behaviors and surgical practices of 19th century physicians." Similarly, Owsley's (1995: 120) analysis of remains recovered from one of the cemeteries associated with Charity Hospital in New Orleans, Louisiana, provided "an example of the way that bioarchaeology cannot only complement documentation but also enhance understanding of the evolution of a particular field such as surgery." During excavation and analysis of the osteological material recovered from the site of the Uxbridge Almshouse Burial Ground, researchers observed a craniotomy in one adult male. Wesolowsky's (1991: 253) discussion of the evidence explores the "context of the development of the postmortem examination, the needs of medical education, the rise of the hospital from the almshouse, and the spirit of scientific enquiry in the 19th century …"

Researchers are also approaching the evidence of postmortem examination from a biocultural perspective contextualized within social theory. This is reflective of a broader trend within bioarchaeology of increasingly engaging with social theory to examine social identity (e.g., Gowland 2006; Knudson and Stojanowski 2008; Knüsel et al. 2010; Sofaer 2011) and the lived social experience (e.g., Crandall 2014; Harrod et al. 2012; Klaus 2012; Schug et al. 2013). Further, drawing upon archaeological and sociological treatments of the body and embodiment (e.g., Chapman 2000; Crossland 2009; Fowler 2010; Jones 2005) and the recognition that death is not the end of social existence (Hallam et al. 1999; Tarlow 2008), bioarchaeologists are examining "death history" (Geller 2012: 116) or "death experiences" (Nystrom 2014: 766) of the body. This ranges from considering the continued presence of postmortem agency (e.g., Crandall and Martin 2014; Tung 2014) to the fragmentation of the body and the persistence of personhood (e.g., Crossland 2009; Duncan and Schwarz 2014; Geller 2012; Nystrom 2011). Falling under the umbrella of what can be called social bioarchaeology, this type of research attempts "to transcend the skeletal body into the realm of lived experience and to make a significant contribution to our understanding of social processes and life in the past" (Agarwal and Glencross 2011: 3).

The most substantive and holistic set of analyses that could be considered to fall within this biocultural/social bioarchaeological approach was the Blakely and Harrington (1997) edited volume *Bones in the Basement: Postmortem Racism in Nineteenth-Century Medical Training*. Contributors to this volume provide an in-depth look at the history, archaeology, and biological anthropology of the human remains recovered from the basement of the Medical College in Augusta, Georgia. The editors, and several of the authors, contextualized their results in reference to the structural inequality that legitimated the use of African American and the indigent for anatomical study.

Over the last decade the number of sites in the United States that have yielded skeletal evidence of postmortem examination has increased significantly (Table 1.1 and Fig. 1.1). This volume will illustrate the diversity of approaches that researchers have adopted to investigate evidence of postmortem examination. Several themes emerge throughout this volume, though they are given different levels of emphasis by different authors, including the development of the medical profession, the social history and significance of postmortem examination, social marginalization and structural inequalities, and the changing perception and understanding of the body and personhood.

Dissection vs. Autopsy

Because this volume is about the interpretation of skeletal evidence of dissection and autopsy, it is important to establish how these terms are being used. There are several terms in the literature referring to different, yet interrelated, types of postmortem procedures including postmortem examination/intervention/alteration, medical intervention, surgical experimentation/demonstration/training, teaching specimen/specimen preparation, prosection, and of course, autopsy and dissection.

Elsewhere I have used "postmortem examination" as a general term to refer to all postmortem procedures (Nystrom 2011) while Novak (Chap. 5) and Crossland (2009) use postmortem intervention in much the same manner. Chamberlain (2012: 15) collapses both antemortem and postmortem evidence into the term "medical intervention" which refers to any "… surgical procedures undertaken on living patients such as amputations and trephinations as well as anatomical and pathological investigations performed on cadavers including craniotomies, anatomical prosections and autopsy procedures." Evidence of postmortem surgical experimentation or surgical training (Chamberlain 2012) may manifest as "… one or, more often, several cuts in unusual places such as on the maxillae, malars or mandible, or sections with atypical orientations (e.g., diagonal to or along the longitudinal axis of long bone diaphyses)" (Owsley 1995: 127).

Table 1.1 Samples with known skeletal evidence of dissection or autopsy from the United States

Sample	Time range	References
Early Colonial		
Champlain's Cemetery	1604–1605	Crist et al. (2004) and Chapter 2
James Fort, Virginia	1611–1617	Chapter 3
Charlton's Coffeehouse	1760s	Chapter 4
Medical Institutions		
Charity Hospital Cemetery	1735–1811	Owsley (1995) and Chapter 8
Holden Chapel, Harvard	1800–1850	Hodge (2013) and Chapter 6
Medical College of Virginia	1800–1860	Chapter 7
Medical College of Georgia	1835–1912	Blakely and Harrington (1997)
Eastern State Hospital	1839–1861	Pollack and Worne (2014)
University of Michigan	1850–1900	Blakely (1997)[a]
Valley Medical Center	1876–1930s	DiGiuseppe and Grant (pers. comm. 2014)
Huntington Anatomical Collection	1893–1921	Chapter 9
Terry Anatomical Collection	1910–1967	Chapter 9
Hamann-Todd Collection	1893–1938	Chapter 9
W. Montague Cobb Collection	1932–1969	Chapter 9
Almshouse Cemeteries		
Albany County Almshouse	1826–1926	Lusignan (2004) and Chapter 15
Blockley Almshouse	ca. 1838–1905	Crist and Crist (2011) and Chapter 12
Erie County Poorhouse	1850–1920	Nystrom (2014) and Chapter 13
Dunning Poorhouse	ca. 1851–1869	Chapter 14
Uxbridge Almshouse	1831–1872	Wesolowsky (1991)
Milwaukee County Poorhouse	1878–1925	Chapters 10 and 11
Public Cemeteries		
New York African Burial Ground	1712–1794	Blakey (2004)
Spring Street	1820–1846	Novak and Willoughby (2010) and Chapter 5
Newburgh Colored Burial Ground	1830–1870	Nystrom (2011)
8th St. First African Baptist Church	1823–1841	Angel et al. (1987)
Freedman's Cemetery	1869–1907	Davidson (2007)
Old Frankfort	ca. 1804–1848	Pollack et al. (2009)
Alameda-Stone Cemetery	ca. 1860–1881	Heilen et al. (2012)
Other		
Annapolis, Maryland	1864–1929	Mann et al. (1991)

[a]This data is unpublished and is referred to by Blakely (1997)

During the eighteenth century, medical schools often relied heavily upon prepared teaching specimens, also known as "preparations," likely often retained from cadavers during dissection (Chap. 6). Evidence for the retention and preparation of such teaching specimens can take the form of pins (Chaps. 5 and 6), hinges (Chapman 1997), cinnabar/vermilion (Chap. 6), specimen bottles (Blakely 1997), the absence of elements (Nystrom 2014), and prosected elements (Chamberlain 2012;

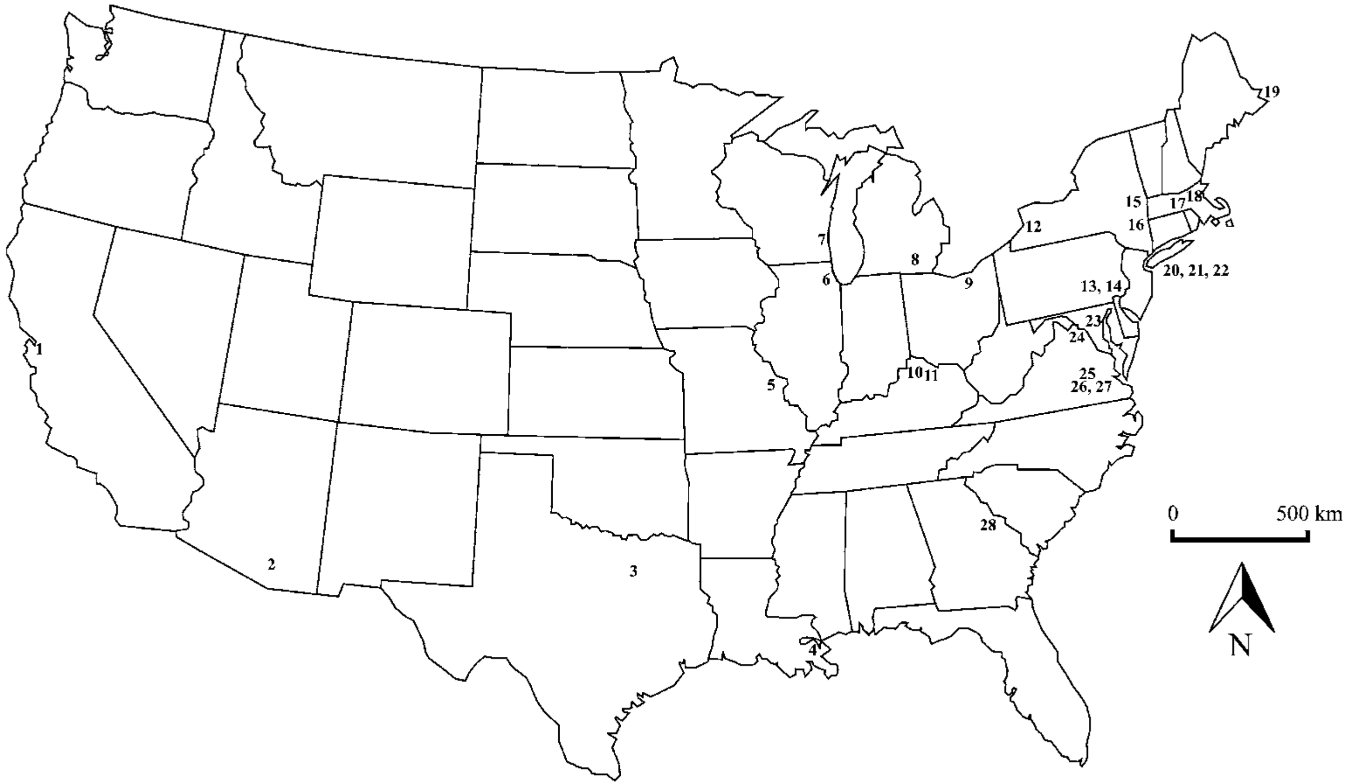

Fig. 1.1 Map of the United States with the sites/collections identified in the text and Table 1.1 indicated. (*1*) Valley Medical Center, Santa Clara, CA; (*2*) Alameda-Stone Cemetery, Tucson, AZ; (*3*) Freedman's Cemetery, Dallas, TX; (*4*) Charity Hospital, New Orleans, LA; (*5*) Terry Anatomical Collection, St. Louis, MO; (*6*) Dunning Poorhouse, Chicago, IL; (*7*) Milwaukee County Poorhouse, Milwaukee, WI; (*8*) University of Michigan, Ann Arbor, MI; (*9*) Hamann-Todd Osteological Collection, Cleveland, OH; (*10*) Old Frankfort Cemetery, Frankfort, KY; (*11*) Eastern State Hospital, Lexington, KY; (*12*) Erie County Poorhouse, Buffalo, NY; (*13*) Eighth Street First African Baptist Church, Philadelphia, PA; (*14*) Blockley Almshouse, Philadelphia, PA; (*15*) Albany County Almshouse, Albany, NY; (*16*) Newburgh Colored Burial Ground, Newburgh, NY; (*17*) Uxbridge Almshouse, Uxbridge, MA; (*18*) Holden Chapel, Harvard, MA; (*19*) Champlain's Cemetery, Saint Croix Island, ME; (*20*) Spring Street, New York City, NY; (*21*) Huntington Anatomical Collection, New York City, NY; (*22*) New York African Burial Ground, New York City, NY; (*23*) Annapolis, MD; (*24*) W. Montague Cobb Human Skeletal Collection, Washington, DC; (*25*) Medical College of Virginia, Richmond, VA; (*26*) Charlton's Coffeehouse, Williamsburg, VA; (*27*) James Fort, Jamestown, VA; (*28*) Medical College of Georgia, Augusta, GA

Henderson et al. 1996; Hillson et al. 1998; Western and Bekvalac 2015). Prosection refers to the dissection of specific elements or structures by a more experienced anatomist which are then used as demonstration tools. Hillson et al. (1998: 16) discuss an example of a prosected cranium that has been sectioned sagittally and transversely, what the authors refer to as "classic cuts used in preparing specimens for anatomy classes."

Finally, the term dissection is reserved for the postmortem examination of the body for anatomical study and/or research whereas autopsy specifically refers to examination of the body in order to determine the cause of death. These definitions have structured the interpretation of skeletal evidence since bioarchaeologists began systematically investigating postmortem examination (e.g., Owsley 1995). Even in those instances in which authors do not explicitly operationally define or differentiate between these procedures, it is clear that these definitions are guiding the investigation. For instance, Angel and colleagues (1987: 224) noted the presence of hyperostosis frontalis interna in a young adult female and suggest that behavioral changes associated with the condition "probably led to her autopsy." Similarly, in reference to the remains of a 10-month old from Christ Church, Spitalfields, Molleson and Cox (1993: 89) speculate that the "postmortem examination was the last attempt of a grieving father to understand the cause of his son's illness and death."

While historical research (Dittmar and Mitchell 2015) points towards important operational distinctions between dissection and autopsy that may be useful for bioarchaeologists, in reality they can be difficult to distinguish in archaeological material. The two sources of data that are commonly used to differentiate between these procedures include the degree of skeletal fragmentation and the context of the remains.

Differentiating between autopsy and dissection rests in part on the degree to which the body has been fragmented and altered (Cherryson 2010; Crossland 2009). In autopsies, which historical manuals indicate were generally limited to opening the cranium, the thorax, and the abdominal cavities (Dittmar and Mitchell 2015), fragmentation of the skeleton would be limited. Two procedures that are commonly considered diagnostic of autopsy are craniotomies (removal of the calvarium or colatte) and thoracotomies (cuts through the clavicles and ribs) (Chamberlain 2012; Cherryson 2010; Dittmar and Mitchell 2015; Waldron and Rogers 1988).

Alternatively, dissection generally involves a more comprehensive examination of the body and thus would result in a greater degree of fragmentation. Similar to Owsley's (1995) description of evidence of surgical experimentation, one could expect to find multiple saw marks, transected bones, or other "unusual" cutmarks. Western (2012: 30) identifies "cuts that clearly would have been of no therapeutic value" such as "sagittal and longitudinal cuts cross the vertebrae, sacra, and ilia" in addition to "sophisticated oblique and sagittal cuts made to remove cranial segments in order to view the frontal and occipital lobes of the brain in situ" as evidence of dissection. Dittmar and Mitchell (2015: 78) suggest that the presence of knife marks on unopened crania is "a newly identified criterion of human dissection and specimen retention for anatomical education." Other osteological clues indicative of dissection include the multiplication of elements in a grave, preparation of the element for display or teaching (e.g., pins or hinges), and replacement of part or all of the body.

Arguably these procedures occupy ends of a spectrum, for even during an autopsy there would opportunities to study morbid anatomy. Thus, there is some methodological overlap between dissection and autopsy; an autopsy may necessitate "unusual" cuts or dissection may involve both thoracotomy and craniotomy. Given this, careful consideration of the context in which the remains are found is paramount.

Bodies with evidence of postmortem examination have been recovered from both formal mortuary (i.e., cemeteries) and non-mortuary contexts. In the latter, bodies or body parts were not formally interred, with examples in the literature including deposition in basements (Blakely and Harrington 1997), dry wells (Hodge 2013, Chaps. 6 and 7), trash-laden fill/midden (Chaps. 3 and 4), privies (Mann et al. 1991), and in backyard pits (Hillson et al. 1998; Hull et al. 2003). The remains recovered in these contexts tend to be incomplete, disarticulated, and highly fragmented and therefore are more commonly interpreted as resulting from dissection, surgical experimentation (Owsley 1995), or as the remnants of teaching collections (Hull et al. 2003).

Interpretation and distinguishing between autopsy and dissection in remains recovered from formal mortuary contexts is perhaps less straightforward. There are two types of formal mortuary sites from which dissected/autopsied remains have been recovered; public cemeteries (e.g., Angel et al. 1987; Chap. 2; Davidson 2007; Heilen et al. 2012; Chap. 5; Nystrom 2011; Pollack et al. 2009) and institutionalized contexts such as almshouse cemeteries (e.g., Chaps. 12, 13, and 14), and cemeteries associated with medical institutions (e.g., Boston and Webb 2012; Chapman 1997; Fowler and Powers 2012; Chap. 8; Owsley 1995). There is no simple correlation between these contexts, however, and if the skeletal evidence indicates dissection or autopsy.

While the line between dissection and autopsy may be blurred, differentiating between them is very important due to their associated social significance. During the eighteenth and nineteenth centuries, dissection was widely regarded as a violation of the body and, as discussed more fully below, was punitive in nature. Dissection simultaneously stripped the individual of their social identity, transforming the body into an object, while reinforcing a marginalized social identity (Crossland 2009). Autopsies, on the other hand, marked an individual as important enough as to warrant an investigation of their death (Crossland 2009; Martensen 1992; Sappol 2002). Therefore, while it is clearly important to distinguish between an autopsy and dissection from a methodological point of view and thus contributing to our understanding of the development of medical education and practice, differentiating between the two procedures is also vital in the sociocultural interpretation of the procedures.

Organization of the Volume

The volume is divided into four sections; *Evidence from Early Colonial America*, *Evidence from Public Cemeteries, Evidence from Medical Contexts*, and *Evidence from Almshouse Cemeteries*. Part I contains three chapters that discuss evidence of postmortem examination from the early seventeenth to mid-eighteenth centuries. In all three instances, the skeletal remains that are discussed are fairly scant; a single individual in the chapter by Crist and Sorg and a handful of isolated elements in the contributions from Chapman and Kostro and Bruwelheide and colleagues. The contexts in which the individuals were excavated are distinct; a one-time use cemetery and trash-fill/middens. The historical contextualization of these remains serves to establish the link between European medical education and the emergence and development of the medical profession within the United States, as many of the founders of American medical schools were initially trained in Europe.

Part II discusses evidence of dissection/autopsy that has been observed in public cemeteries. Similar to the above, there are only a small number of individuals that have been recovered from public cemeteries in which evidence of postmortem examination has been observed. By grounding their analyses within archaeological and historical data, researchers are able to move beyond detailed case-studies to discussions that consider the evidence within regional and national contexts.

The chapters in Part III discuss evidence from medical institutions, here defined as a hospital, medical center, or medical school. Anatomized remains from these contexts have been recovered from both formal burial grounds and non-mortuary contexts such as wells (e.g., Chaps. 6 and 7) and basements (Blakely and Harrington 1997). Examining the patterning and distribution of the cut and saw marks provides insight into the evolution of surgical practice and medical education. The final disposition of the anatomized remains also provides the opportunity to examine the transformative nature of dissection.

While Part IV is entitled *Evidence from Almshouse Cemeteries* and is intended to distinguish it from the contexts discussed in Part III, in reality there is overlap between the categories. The emergence of the medical profession in the United States during the nineteenth century is closely tied to the development of the almshouse and the changing social perception of the poor. Originally intended to help the poor and to provide relief, almshouses became a significant source of bodies for medical schools. There was often a close association between almshouses and hospitals or medical schools and given this, the boundary between what represents a "medical context" and an "almshouse context" can be somewhat indistinct. Indeed, many of the almshouse cemeteries discussed in Part IV contain the remains of almshouse inmates as well as those that died at hospitals.

Part I: Evidence from Early Colonial America

In their chapter, Thomas Crist and Marcella Sorg discuss the oldest skeletal evidence of postmortem examination in the New World. During the severe winter of 1604–1605, 35 of the 78 colonists in the New France colony on Saint Croix Island died from what Samuel de Champlain described as "*mal de la terre*," later diagnosed as scurvy (Crist and Sorg 2014). Champlain published his account of the events from that winter and described in detail the autopsies that were performed in an effort to determine the cause of these deaths. Excavations in the 1950s and 1969 identified the remains of 25 individuals, but it was not until a 2003 (re)excavation that skeletal evidence of an autopsy was observed in a single individual. Crist and Sorg provide a rich historical background to this evidence, discussing the history of dissection, autopsy, and anatomy and the changing perception of the relationship between the body and the soul. The authors consider if social status and religion may have contributed to who among the colonists were autopsied. While ultimately concluding that these factors had little influence, they note that this may have played a role in how the men were memorialized.

Working with skeletal remains from very nearly the same time period, Karin Bruwelheide and colleagues discuss evidence from the first successful English colony of Jamestown. Fragmented crania from three males were recovered from pre-1617 fill located in three different contexts (a bulwark trench, a cellar, and a well). While only one has evidence of dissection, all three were found in association with discarded medical equipment. This led the authors to suggest that these remains may have been retained by Jamestown surgeons and was disposed of upon their death or departure from the colony. The disposal of the crania as waste may not be due solely to expediency, but also may be reflective of the status of the deceased. The precedent of using dissection as a form of postmortem punishment had already been established in the reign of Henry VIII and it is possible that these remains represent criminals whose bodies were consigned to the surgeon's table upon their death.

Ellen Chapman and Mark Kostro marshal skeletal evidence recovered during the excavation of the Charlton Coffeehouse in Williamsburg, Virginia (ca. 1755–1767) to discuss the performance of the dissection and its relationship to the medical training and the medical profession in early Colonial America. As discussed by the authors, coffeehouses were spaces that were simultaneously public spaces where socioeconomic distinctions could be temporarily suspended but also where an elite social status may be established and reinforced. Skeletal material recovered from a trash midden exhibiting cutmarks suggests that the coffeehouse was used as a semi-private space in which observers and participants could have furthered their medical training while engaged in negotiating their socioeconomic status.

Part II: Evidence from Public Cemeteries

There are only two contributions to this section. First, I provide a brief synthesis of the available evidence of postmortem examination from public cemeteries including: Alameda-Stone Cemetery (Heilen et al. 2012), Eighth Street First African Baptist Church (Angel et al. 1987), New York City African Burial Ground (Blakey 2004), Old Frankfort Cemetery (Pollack et al. 2009), Freedman's Cemetery (Davidson 2007), and Newburgh Colored Burial Ground (Nystrom 2011). In each case, only a few individuals exhibited evidence of dissection or autopsy. In the first four sites listed above, treatment of the evidence was brief and principally descriptive. In the latter two sites, in addition to the Spring Street Presbyterian Church (Chap. 5; Novak and Willoughby 2010), the evidence is placed within its historical context and used as a framework for discussing the sociopolitics of race, inequality, identity, and personhood.

These contexts lend themselves to a biographical approach, exemplified by Shannon Novak's offering on the Spring Street Presbyterian Church. In 2006, four burial vaults (ca. 1820–1846) belonging to the Spring Street Presbyterian Church were rediscovered during construction (Mooney 2010). Three individuals, an adult male, an infant, and an adolescent, exhibited evidence of postmortem examination. Based on the skeletal evidence, Novak concludes that the former two were autopsied, whereas the adolescent was dissected. Adopting a biographical approach, Novak brings together both artifactual and documentary evidence to reconstruct the life and death histories of these individuals. Recognizing that the body is relational and dynamic, she discusses how personhood may have been constructed in both life and death.

Part III: Evidence from Medical Institutions

Anatomy played a central role in the development of medical education and the establishment of medical authority; it served to bridge the traditional divide between surgery and physic, the two sub-fields of the medical profession at the time, and facilitated the transition from a "craft" and an "art" to a discipline grounded in science (Sappol 2002). Anatomy also became linked to social mobility and status. During the early modern era, it became fashionable to attend anatomical dissections and the knowledge and patronage of anatomy became linked with elevated social status (Chap. 4; Richardson 1987; Sappol 2002). Studying anatomy thus not only was a hallmark of a scientifically grounded medical practice, but it also became a means of elevating one's social status.

From the royal decrees of James IV (in 1506) and Henry VIII (in 1540) that granted judges the power to order the dissection of murderers, anatomy was intertwined with social transgression and punishment. In the American colonies, in 1641 and 1647 Massachusetts passed the first statutes that allowed the dissection of executed criminals (Sappol 2002). At this time and up through the 1700s, medical education in North America was still nascent, with those that could afford to traveling to Europe (principally Paris, London, and Edinburgh) to study anatomy. The proliferation of medical schools in the nineteenth century, in large part driven by the demand for anatomical training (Sappol 2002), meant that the supply of available cadavers began to fall short. This created a market for illegally acquired, "resurrected" bodies, drawn principally from socially marginalized groups such as enslaved and free African Americans, Native Americans, criminals, and the poor. Though they did little to stop resurrection, many states passed anti-grave robbing legislation (Connecticut—1810, Massachusetts—1815, New York—1819, Maine—1820, Ohio—1846), often incorporating the legal right to dissect criminals (Federal government—1790, Michigan—1844, New Hampshire—1869, Vermont—1870). In the face of escalating enrollments, many medical schools were struggling to acquire enough cadavers to supply their anatomy courses. As is detailed in Part IV, legislatures and medical schools sought to alleviate this bottleneck by advocating for the passage of anatomy laws that made it legal to acquire the unclaimed bodies of almshouse inmates.

Christina J. Hodge and colleagues, integrating skeletal analyses and documentary evidence, consider how dissection impacted personhood and individuality based on skeletal remains recovered from the Holden Chapel on Harvard's campus. During renovation in 1999, archaeologists excavated a dry well that contained a mixture of animal remains, ceramics, architectural debris, scientific glassware, and the anatomized skeletal remains of approximately 20 individuals. Beginning in 1801, Holden Chapel was the home of the Harvard Medical School and was the location for both anatomy and chemistry lectures, with the former continuing on in the space until approximately 1850 (Hodge 2013). The recovered artifacts represent the accumulation of debris stemming from the periodic renovations and repurposing of Holden Chapel. Similarly, the human remains represent the waste and detritus of the anatomical courses that were held in the Chapel and reflect the transition from subject (i.e., a named person) to object (e.g., teaching tool). Further, they consider how the performance of the dissection was integral in the establishment of medical authority within the United States.

Doug Owsley and colleagues also discuss anatomized remains recovered from a well associated with a medical school building. During construction on the Medical College of Virginia campus of the Virginia Commonwealth University, construction workers encountered a brick and mortar well containing animal bones, building debris, medical instruments, ceramics, and a large amount of human bones representing approximately 44 adults and 9 children. The authors distinguish between evidence of dissection and surgical practice (e.g., sectioning of long bones) and autopsy (e.g., perimortem trephination in response to cranial trauma followed by craniotomy). A metal hook in the glenoid fossa of an adult scapula also points to the retention of elements and the creation of teaching specimens.

The well was used as a dump between 1848 and 1860 and is associated with the Egyptian Building, the first official building of the Medical College. The building included lecture rooms, a dissection theater, and an infirmary, the latter principally serving immigrants, migrant workers, and free and enslaved African Americans. The authors explore the historical context of the development of medical education in Richmond, detailing the centrality of anatomy in the curricula and the efforts the school went to in order to procure cadavers. Historical documents also attest to the potential source of cadavers, including the Egyptian Building infirmary, Richmond's potter's field, the Negro burial ground, and the state penitentiary. Owsley and colleagues demonstrate that most of the individuals were of African descent and further that some of the individuals may have been African while others aligned more closely with African-American skeletal samples that exhibit a greater amount of admixture.

As the chapter by Christine Halling and Ryan Seidemann demonstrates, the story of the Charity Hospital continues to unfold. Following the 1986 recovery and analysis of remains from what is called Charity Hospital Cemetery #2, further disturbances resulted in the accumulation of additional skeletal remains from both Charity Hospital Cemetery #2 (due to roadwork) and from Charity Hospital Cemetery #1 (in advance of the construction of the Hurricane Katrina Memorial). Expanding upon Owsley's (1995) work, Halling and Seidemann contextualize their research within the history of the intersection between race, poverty, and medical training and articulate the evidence of dissection as manifestations of structural violence.

At first glance, it may seem unusual to encounter the chapter by Jennifer Muller and her colleagues that deals with the history of the Robert J. Terry Anatomical Collection, the Hamann-Todd Osteological Collection, the George S. Huntington Anatomical Collection, and the W. Montague Cobb Skeletal Collection, in a volume on dissection and autopsy. These samples are the largest documented skeletal collections in the United States and the former two have been intensively studied (Hunt and Albanese 2005). The individuals in these samples were dissected as part of medical training, exhibit the same type of skeletal evidence of postmortem examination, and derive largely from the same sources as discussed in the other chapters. The majority of individuals that make up these collections were the unclaimed bodies of the poor and socially marginalized, coming from almshouses, charity hospitals, mental institutions, and penitentiaries. The collections were formed within a cultural context in which certain groups were more vulnerable to harm and violence stemming from systemic political, economic, and social inequalities.

Part IV: Evidence from Almshouse Cemeteries

Two distinct social processes emerged during the 1800s that focused attention on almshouses and those that sought assistance at these institutions. Fundamental changes occurred to the nature of work and employment with the advent of the Industrial Revolution, creating "a class of highly mobile wage laborers subject to irregular, seasonal, dangerous, unhealthy, often badly paid work" (Katz 1986: 9–10). In the face of the escalating number of poor in the first decades of the nineteenth century, the social welfare system was in need of reform (Rothman 1971). At the time the dominant form of social support was "indoor" assistance in which individuals received support where ever they were currently living. This type of support was considered to encourage the "unworthy" poor and subsequently pauperism. The problem faced by states and charitable societies was how to support those considered to be "worthy" poor (those unable to work due to age or illness) without simultaneously supporting and encouraging pauperism. The almshouse was perceived to be the answer: by transferring social relief into the controlled environment of the alms or poorhouse, the worthy poor could obtain the assistance they deserved, while also providing the opportunity to reform the character flaws of the "unworthy" poor through labor. While institutions in the early 1800s appear to have been succeeding in their mission and reducing pauperism, by the mid-point of the century nearly every one "had lost its original promise" (Katz 1986: 25) and ultimately exacerbated the vulnerability of the poor.

As discussed above, with the proliferation of the medicals schools during the 1800s, the demand for cadavers outstripped the available supply. While some medical schools were associated with public hospitals and may have been able to obtain specimens in that manner, or may have simply resorted to systematic grave robbing, the almshouse came to be considered as a steady and legitimate source of anatomical specimens. The utilitarian philosophy of Jeremy Bentham linked poor law reform and anatomical study and directly influenced the development of anatomy laws in both the United States and Britain (Richardson 1987; Sappol 2002). Bentham argued that almshouses should be punitive in nature and intentionally designed to dissuade people from seeking public assistance. Furthermore, a person's value is based on their contribution to society and the public good; those individuals that did not or could not contribute to society should be made to work. If an individual died while in the almshouse, they should repay their debt to society and their body should be used for to benefit medical science and society at large.

In Britain, a Select Committee on Anatomy was formed in 1828 with Henry Warburton serving as chair "to inquire into the manner of obtaining Subjects for Dissection in the Schools of Anatomy, and into the state of the Law affecting the Persons employed in obtaining or dissecting bodies" (*Common's Journal* 22.4 1828, cited by Richardson 1987: 101). Warburton, in addition to many members of the committee, were strong supporters of the Benthamite philosophy and the Committee's report, and the subsequent Anatomy Acts based on it (first attempted in 1829 and then successfully passed in 1832), clearly demonstrate the impact of Jeremy Bentham (Richardson 1987).

As many of the founders of American medical schools received anatomical training in Britain or Europe, it is not unexpected that this philosophy would have influenced the development of anatomy acts in the United States. In the first half of the nineteenth century, state governments began to pass anatomy laws that granted medical schools and doctors the legal right to appropriate unclaimed bodies. While on the surface these acts had the principal goals of stopping grave robbing and the advancement of medical science, they also reframed dissection as a deterrent against indigence and as a means of social control. The almshouses that were established to assist and help the poor became a significant source of bodies for medical schools.

There are two chapters that focus on remains recovered during excavations on the grounds of the Milwaukee County Institutional Grounds (MCIG) in Wauwatosa, Wisconsin. While initially established as the Milwaukee County Poor Farm in 1852, eventually several different institutions were established including the Milwaukee County Asylum, the Milwaukee County Hospital, and the Home for Dependent Children. Additionally, there are four cemeteries known to be on the grounds; three remain undisturbed while the fourth, used between 1882 and 1925, was excavated in 1991/1992 and again in 2013. The former excavations recovered 1649 individuals, 165 of which exhibited some form of postmortem examination; 761 individuals were recovered during the 2013 excavations with 178 displaying evidence of postmortem examination. Taken together, this represents one of the largest skeletal collections of its kind and the largest number of dissected/autopsied individuals from an archaeological context. The authors of both chapters contextualize their discussion within the history of the development of the medical profession in Wisconsin and Milwaukee in particular. Additionally, the authors highlight the socially marginalized status of the individuals that drew upon the services of the institutions at the MCIG and that were ultimately buried on the grounds.

Sean Dougherty and Norman Sullivan found that in the 1991/1992 collection, craniotomies were the most common procedure, whereas involvement of postcranial elements was much less frequent. The authors also document the excision and retention of some elements (e.g., skulls, long bone segments). Given this, Dougherty and Sullivan suggest that most of these "examinations were limited and purposeful, as would be expected for an autopsy" though dissection, surgical practice, and retention of specimens was also occurring.

Using the *Register of Burials* from the Milwaukee County Poor Farm and Milwaukee County Coroner's Inquests records, Patricia Richards and colleagues were able to determine that of the 7008 people buried in the cemetery between 1882 and 1925, 28 % ($n = 1965$) had some kind of postmortem examination. Further, these records contained information on the nature of the postmortem, with the majority being conducted for anatomical purposes (i.e., dissection, 23.3 %) followed by medicolegal investigations (i.e., autopsies, 3.3 %) and hospital inquiries (1.6 %). Based on their analysis of the skeletal evidence, the authors conclude that 28.7 % of the recovered individuals were dissected and 11.8 % were autopsied.

Thomas Crist and colleagues provide a richly detailed history of the Blockley Almshouse in Philadelphia and the central role it played in the development of the medical profession in the city. The Blockley Almshouse represents the third institution constructed by the city to assist the poor and by 1830 was serving over 1500 people annually. Thousands of medical students passed through the almshouse's medical department (eventually called the Philadelphia Hospital) providing health care to inmates. However, remains of the deceased were used to study gross anatomy and practice surgical techniques, evidence of which was recovered during excavation of the almshouse cemetery in 2001. In addition to 167 grave shafts containing 442 individual interments, several clusters containing thousands of commingled human remains with evidence of dissection and/or autopsy were recovered. While a significant portion of the chapter details research conducted on the remains over the last decade, the authors ground their discussion within the context of the function and role of the almshouse at this point in American history, noting that the skeletal remains "collectively embody the social identity of the marginalized people of post-bellum Philadelphia."

While acknowledging this socially marginalized status in life, the authors note that "some small level of dignity was reserved for these mutilated body parts" in that they were buried. In this sense, when viewed relative to some of the other contributions to this volume, Crist and colleagues' chapter serve to highlight the paradoxical treatment of dissected human remains, in some instances being treated akin to trash and waste while in other contexts being afforded "normative" mortuary treatment (see also Chap. 11).

In our chapter, my colleagues and I discuss evidence of dissection observed in skeletal remains recovered from the Erie County Poorhouse in Buffalo, New York as a manifestation of structural violence. Defined as harm experienced by individuals or groups due to systemic political, economic, and social inequalities, the concept is generally employed to frame the discussion of the lived experience and how these inequalities may, for example, impact health (e.g., Farmer et al. 2006; Klaus 2012). During the nineteenth century, social welfare reform and the development of the almshouse system was fundamentally based upon disparities in access to economic and political capital. Therefore at one level, the generally poor living conditions experienced by almshouse inmates and any health consequences stemming from those conditions are reflective of structural violence. We also argue that the development and passage of anatomy laws during the nineteenth century, again reflective of differential access to political and economic power, exposed specific groups to a form of postmortem harm.

Anne Grauer and colleagues discuss evidence of postmortem examination in skeletal remains recovered from a cemetery associated with the Cook County Poor Farm and Insane Asylum (1851–1869) on the outskirts of Chicago. Originally excavated in 1990, the skeletal remains of approximately 120 individuals have been previously studied, providing insight into the impact of poverty in nineteenth century Chicago (e.g., Grauer and McNamara 1995; Grauer et al. 1999). Out of this assemblage, four burials were recovered that exhibited evidence of postmortem examination. Despite the fact that the collection was excavated nearly 25 years ago, and some data from the original excavation cannot be reconstructed, the authors are able to contextualize their discussion as it relates to the perception and attitude towards the poor during that period in Chicago's history. Indeed, the authors' discussion of dissection truly complements the previous research conducted on the collection as both efforts reflect manifestations of embodiment.

Returning to the northeast, Kimberly Lusignan Lowe discusses evidence of postmortem examination from the Albany County Almshouse cemetery. The Albany County Almshouse cemetery served as the burial site for almshouse inmates, individuals from local hospitals and penitentiaries, and unclaimed bodies from the City of Albany between 1826 and 1926 (Solano 2006). The Albany Medical Center, established in 1839, had a close relationship with the Almshouse; historical records indicate that the former received over 300 bodies from the Almshouse beginning in 1894 (Solano 2006). Excavated initially in 1989 and again in 2002, the skeletal remains of over 1400 individuals were recovered, of which only 51 exhibited evidence of postmortem examination. Thus, the recovered skeletons represent only a very small proportion of the potential number of individuals utilized by the Medical Center; the final disposition of the other remains is unknown. Commiserate with the historical documentation, Lusignan Lowe documents variability in the form, location, and quality of the procedures, reflecting the fact that these individuals were specimens in gross anatomy courses where students were learning dissection techniques. Her comparison of the demographic profile of the total skeletal collection and the dissected sub-sample with available state census reports highlights how distinctive almshouse inmates were relative to the general populace.

The central focus of all of the chapters in this volume is the contextualized analysis of human skeletal remains. The holistic perspective of the field is illustrated in the diversity of how researchers realized this contextualization, through detailed engagement with medical history, the social history of race and politics, and the integration of social theory. The contributions to this volume illustrate the potential these data have for contributing to our understanding of the development of the medical profession, the relationship between social marginalization, inequality, personhood, and the body. The studies in this volume provide a means of not only reconstructing the intersection between social processes and lived experience in the past, but also the how sociopolitical forces and institutions may impact the postmortem treatment and fate of the body.

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Part I
Evidence from Early Colonial America

Chapter 2
Renaissance Anatomy in the Americas: A Bioarchaeological Perspective on the Earliest Skeletal Evidence of Autopsy in the New World

Thomas A. Crist and Marcella H. Sorg

Introduction

In October 1564, Andreas Vesalius, the Flemish author of history's most significant text on human anatomy, died on the Greek island of Zakynthos in the Ionian Sea. On a voyage from Egypt to Venice, Vesalius's ship had been caught for more than a month in severe storms and he was probably suffering from scurvy (vitamin C deficiency) when he made it to shore and died shortly afterwards (Biesbrouck and Steeno 2010, 2011). The body of the "father of modern medicine" whose work forever established human dissection as the core of medical education was interred without an autopsy in a grave outside the island's Roman Catholic church and has been since lost to the ages.

Exactly 40 years later across the Atlantic Ocean in New France, the first snow began to fall on Samuel de Champlain's settlement on tiny Saint Croix Island, located in the middle of the river that now serves as the border between Maine and Canada (Fig. 2.1). Champlain (1574–1635), later known as the "father of New France," was the surveyor and mapmaker for a colonizing expedition directed by the Huguenot nobleman Pierre Dugua, Sieur de Mons (1564–1628), to whom King Henri IV had granted a fur trade monopoly. Unprepared for the freezing temperatures and lacking sufficient food and fresh water, Champlain and 78 other colonists became trapped on the island over the severe winter of 1604–1605. As he reported 8 years later in his

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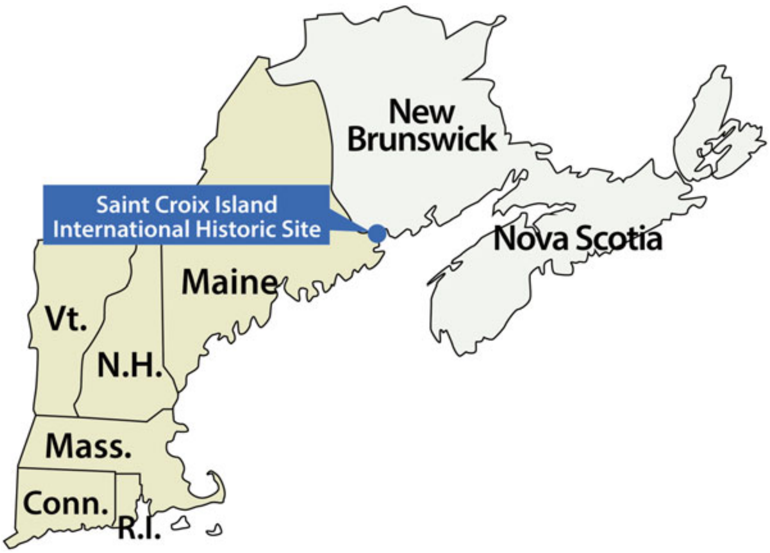

Fig. 2.1 Location of Saint Croix Island, Maine

book *Les Voyages*, 35 of the men died of an illness that Champlain called "*mal de la terre* (land sickness), otherwise scurbut" (Champlain (1922 [1613]:303). Based in part on Champlain's descriptions of the colonists' clinical symptoms, modern diagnosis indicates that they had indeed suffered from scurvy (Crist and Sorg 2014).

Champlain also provided an eyewitness account of the autopsies performed by the settlement's barber-surgeons as they attempted to solve the mystery of the deadly illness at a time when nutritional deficiencies were not understood. Writing that "We could find no remedy with which to cure these maladies. We opened several of them to determine the cause of their illness," Champlain (1922 [1613]:304) then described the results of only the second postmortem examination reported by Europeans in North America. Some 400 years later, excavations of the settlement's cemetery at Saint Croix Island, now an International Historic Site, unearthed the remains of a young man who had been subject to one of the autopsies that Champlain had written about. The youngest of the 25 men discovered in the graves, Burial 10's head had been sawn open to examine his brain and his calotte subsequently replaced under his scalp before he was buried. With this unequivocal evidence of a craniotomy, Burial 10 currently represents the earliest skeletal evidence of autopsy found in the New World.

Bioarchaeologists analyze human remains to reconstruct past human behavior within diachronic, sociocultural frameworks. Researchers employ the methods of skeletal analysis and differential diagnosis to document and better understand aspects of the past that are unavailable from other archaeological and documentary sources. Apart from the resulting paleopathological information (Waldron and Rogers 1987), among recent areas of interest are the social impacts of disease, status differences and class inequality, and colonization on different population subgroups, as well as the various roles the body as a material object plays in both life and in death (Agarwal and Glencross 2011; Murphy 2008). To most effectively explore these areas, this chapter adopts a biocultural perspective that describes and discusses the remarkable discovery of Burial 10's craniotomy at one of New France's earliest settlements. Combined with Champlain's written account, analysis of the young man's remains provides a unique opportunity to explore the practice of autopsy in late Renaissance Europe and its importation to the New World. It was during this period in Europe that human bodies were transformed into commodities for use as educational tools due to the strong influence of Andreas Vesalius (1514–1564) and Ambroise Paré (1510–1590), the renowned French Royal Surgeon later called the "father of forensic pathology." Champlain's French barber-surgeons would have been familiar with their anatomical texts in 1604 and ready to conduct the autopsies ordered by Dugua as his colonists died during the winter at Saint Croix Island.

The French physicians and surgeons of the Renaissance performed most of their autopsies on the corpses of royalty and conducted their educational dissections using the remains of criminals, the poor, and foreigners (Cazort 1996; Park 1994; Prioreschi 2001). Given this social context, would Dugua have ordered autopsies of the gentlemen at his settlement? In his account of that tragic winter at Saint Croix Island, Champlain (1922 [1613]) did not provide the names of any of the 35 deceased men nor specify who had been autopsied. The one gentleman whose death recently has been confirmed through documentary research was René Noël, a 31-year-old nobleman known as the Sieur de La Motte Bourgjoli who reportedly died of scurvy on March 31, 1605 and was buried the same day (J.S. Pendery 2012). With greater access to the limited food available at the island, it is likely that few if any of the other noblemen were among the deceased. Even if noblemen did perish, did Dugua and his fellow gentlemen marginalize the workers and servants, as they would have back in France, by using their bodies in failed attempts to discover the cause of their illnesses? Could religious differences have played any role in who was chosen for autopsy? Some inferences can be drawn to address these questions by considering the history of autopsy and dissection in Europe and through a careful reading of Champlain's subsequent works and those of his contemporary Marc Lescarbot (1570–1642), a Parisian lawyer and historian who spent the winter of 1606–1607 in New France with Champlain and several of the other Saint Croix Island survivors.

Historical Context and Archaeology of the Saint Croix Island Settlement

The sociocultural developments that characterized the European Renaissance began in Italy during the fourteenth century and converged in the 1500s to provide Dugua and Champlain with the political opportunities and technological advances to establish their short-lived settlement at Saint Croix Island (Jardine 1996; Knecht 2001; Salmon 1987). By 1604, when they sailed for the New World, fishing fleets from

France, Spain, and other European countries had been making regular visits to the east coast of North America for more than a century. Although fishing was the primary focus of these voyages, an unorganized trade in furs also arose during this period. Beginning in the early 1500s, French ships regularly visited the coast and inland waterways of modern-day Canada and New England. French colonies were established intermittently throughout the sixteenth century but it was the three voyages of Jacques Cartier (1491–1557) between 1534 and 1542 that most firmly established France's claim to modern-day Canada (Biggar 1911; Cartier 1924 [1545]). In 1535, Cartier led the first recorded exploration into the interior of Canada through the St. Lawrence River gateway. He and his crew spent the winter of 1535–1536 near modern-day Québec City where many of the men died from exposure and scurvy. Over the next 60 years, French attempts at colonization were sporadic, with only small trading posts lasting more than several years.

Near the end of the sixteenth century, King Henri IV began to persuade various gentlemen and merchants to establish colonies in Canada in return for official monopolies in the fur trade. Among them was Pierre Dugua, Sieur de Mons, who was granted the royal fur monopoly in 1603. He led his first expedition to New France in 1604 and with Samuel de Champlain as his cartographer built the small settlement at Saint Croix Island in the middle of the Saint Croix River, primarily for defensive purposes. This was Champlain's third expedition to the New World. He and Dugua's fleet of five ships left Havre de Grace in March and reached Saint Croix Island on June 25. There the settlers erected about 20 timber buildings and log huts including a chapel and dwellings for a priest, a minister, two surgeons, numerous artisans and workmen, "Swiss soldiers," and at least ten noblemen (Champlain 1922 [1613]; Lescarbot 1911 [1609]). The ships sailed for France at the end of the summer, leaving 79 men including Dugua and Champlain to brave the oncoming winter. The complement was unprepared for the severe weather that began with the first snow in October.[1] In his report on the events of their time at Saint Croix Island, Champlain (1922 [1613]) wrote:

> During this winter our beverages all froze except the Spanish wine. Cider was given out by the pound…We were obliged to make use of very bad water and to drink melted snow, since we had neither springs nor brooks; for it was not possible to go to the mainland on account of the great cakes of ice carried by the ebb and flow of the tide…most of us, having poor quarters and suffering from shortage of fuel which we could not procure on account of the ice, had almost no strength; and, again, we ate only salt meat and vegetables during the winter, which produced poor blood. Such in my opinion was in part the cause of these unfortunate maladies [including scurbut] (pp. 306–307).

Champlain later wrote that 35 of the 79 colonists had died during the winter; Marc Lescarbot noted that it was 36 men. They were all presumably buried in the cemetery that Champlain depicted in his plan of the colony published in his 1613 book *Les Voyages*. The company's ships returned to relieve the survivors on

[1] The severity of the winter was exacerbated compared to modern times by what has been termed the "Little Ice Age," a period of colder than average temperatures, and longer than average winters (Grove 2001).

June 15, 1605. Later that summer Dugua ordered the settlement dismantled and moved to the opposite side of the Bay of Fundy, establishing a colony at Port Royal (now Annapolis Royal) on the western coast of Nova Scotia that later served as the capital of Acadia until 1710. Due to the failures in effectively colonizing New France under the monopoly system, Dugua lost his royal grant in 1608 but continued to finance trade expeditions until 1622, the most noteworthy of which was Québec City founded by Champlain in 1608.

Archaeological excavations conducted in the 1950s for the US National Park Service revealed the location of the cemetery that Champlain had included in his drawing of the Saint Croix Island settlement (Hadlock 1950; Harrington and Hadlock 1951). More extensive excavations in 1969 identified 23 individuals in the cemetery (Gruber 1970, n.d.). With no physical anthropologist assisting them in the field, Gruber's team exposed but overlooked Burial 10's autopsied cranium. The best-preserved bones and teeth were transported to Temple University in Philadelphia where over 20 years later Crist (1998) documented lesions indicative of vitamin C deficiency among the crania, mandibles, and long bones. Excavations in 2003 to re-inter the remains in their original graves revealed two additional burials and provided the opportunity for an American-Canadian team of bioarchaeologists to systematically examine all of the individuals' skeletons (Crist et al. 2012; Crist and Sorg 2014; S.R. Pendery 2012). Although Champlain had recorded 35 deaths at the settlement, the graves of the other 10 men had been lost to subsequent ground disturbance and erosion of the island's shoreline. It was during the re-excavation of Burial 10's grave in 2003 that his autopsied cranium was identified and documented.

The Practice of Autopsy in Renaissance Europe

Despite the long-standing misconception to the contrary, by the time Champlain landed at Saint Croix Island in 1604, autopsy had been a common practice among European physicians and surgeons for well over 350 years. Like many other cultural values, attitudes regarding the sanctity and appropriate disposal of the dead body varied by region and religious affiliation, with autopsies and dissections more readily accepted in medieval Europe outside of Italy (Brown 1981; Klestinec 2007; O'Neill 1976). Even in Italy, however, the corpses of saints, cardinals, and popes were dismembered with some regularity so that their relics could be distributed to multiple churches and abbeys (Brown 1990; Cazort 1996; Park 1995). It was actually in late thirteenth-century Italy that autopsy and dissection of common people developed into integral parts of forensic investigations and medical education (Crivellato and Ribatti 2006; Park 1994, 1995; Prioreschi 2001). Accounts of autopsies performed for legal proceedings subsequently begin to appear more regularly during the first half of the fourteenth century.

Until its authority faded during the Reformation in the early sixteenth century, the Catholic Church played a significant role in regulating autopsies, dissections, and other postmortem preparations of the human body in Christian Europe

(Alston 1944; Brown 1981). There was no universal prohibition of postmortem examinations during the Middle Ages (Park 2009) but at the Council of Tours in 1163 the Church disallowed embalming and division of parts of the body. By the time of the High Renaissance (ca. 1490–1527), Pope Sixtus IV had permitted medical students at Bologna and Padua to perform autopsies on plague bodies and the interest in human anatomy began to extend beyond jurisprudence and medical education into art and public theater (Carlino 1999; Cazort 1996; Klestinec 2007; Sawday 1995). With these increasingly loosened restrictions, the first reported autopsies in France were performed at the University of Paris in 1477 (Grendler 2004). By then, dissection had already been officially recognized as a teaching method at the University of Bologna in 1405 and at the University of Padua in 1429 (Hellman 1955). The increased availability of printed books fostered this interest and broadened the reach of anatomical knowledge, especially in the methods used to determine causes of death (Furdell 2002). Most famously, in 1543, Andreas Vesalius published his groundbreaking text *De Corporis Humani Fabrica*, which provided the first realistic and accurate drawings of human anatomy.

By this point in the mid-sixteenth century, autopsies and dissections had become accepted methods of medical practice and instruction throughout Europe (Lindemann 2010). In France, the Parisian barber-surgeon Ambroise Paré published several books on surgical methods during the second half of the sixteenth century. These books were remarkable because they were the first texts written in vernacular French rather than Latin, the traditional European academic language (Drucker 2008). When merchant ships began to sail long distances during the Age of Discovery, captains hired surgeons to treat their crews. Many of them carried Paré's books with them. Within the limitations of the period, they practiced preventive medicine, treated illnesses and injuries and, when necessary, performed autopsies. Reflecting their status and shipboard responsibilities, surgeons far outnumbered physicians on both privately owned ships and in the royal navies (Druett 2001). At least three surgeons accompanied Dugua's expedition to Saint Croix Island; Champlain makes note of "our surgeons" who conducted the autopsies and other records indicate that a surgeon named Philippe Raybois had left the island when their ships returned to France in August 1604. It was these and many other unnamed surgeons who carried the medical practices of the Renaissance, including autopsy, to the New World.

Bioarchaeological Evidence of Autopsy at Saint Croix Island, 1604–1605

When Samuel de Champlain published his book in 1613 about his explorations in the New World, he chose to include descriptions of how scurvy had attacked his men at Saint Croix Island in 1604–1605, Port Royal in 1605–1606, and at Québec City in 1609. He also described how his surgeons had conducted autopsies at each settlement in futile attempts to cure the men from the disease that he called *mal de la terre* or "land sickness." As a veteran mariner who had sailed to the Caribbean and New France four

Fig. 2.2 Photograph of Burial 10 taken during Temple University's excavations in 1969. Note sawn cranial fragment resting in the soil at the center of Burial 10's head

times before 1610, Champlain was familiar with the symptoms of scurvy and knew of various purported remedies. None of these, however, were either available or effective. In his account of the autopsies performed at Saint Croix Island over the winter of 1604–1605, Champlain (1922 [1613]) presented the surgeons' findings:

> We could find no remedy with which to cure these maladies. We opened several of them [deceased colonists] to determine the cause of their illness. In many cases it was found that the interior parts were diseased; for example the lungs were so altered that no natural moisture could be seen; the spleen was watery and swollen; the liver very fibrous and mottled, with none of its natural color; the vena cava, both ascending and descending, full of thick, clotted and black blood; the gall tainted. Nevertheless, many arteries, both in the mid and lower bowels, were in pretty good condition. In some cases incisions were made with a razor upon the thighs over the purple spots, whence there flowed a black clotted blood. This is what could be learned from the bodies infected with this disease (pp. 304–306).[2]

The remains of one young man excavated at the Saint Croix Island cemetery presented unequivocal evidence of a cranial autopsy cut. During the original excavations in 1969, each individual grave was assigned a number as it was discovered (Gruber 1970). Burial 10 was found supine in his grave with his elbows slightly flexed, each of his hands lying over the hip on the same side of his body, and his legs fully extended (Fig. 2.2). Burial 10's head was rotated towards the left side, exposing

[2] The description of dry lungs, watery spleen, and black, clotted blood suggests that the autopsy might have been delayed for some time after death, and that the body had been frozen and then thawed for autopsy.

most of the right side of his cranium and mandible. All of Burial 10's facial bones except his hard palate and mandible were fragmented and eroded. Most of his cranial vault was intact except the frontal and right temporal, which had been broken into large pieces. Burial 10's left upper extremity and both lower limbs, several of his left ribs and thoracic vertebral bodies, and both innominates were present and moderately eroded. The bones of both feet were intact. The Temple University archaeologists removed Burial 10's right femur and mandible and brought them to Philadelphia for more detailed study. The condition of Burial 10's cranium was not substantially different when he was re-excavated in 2003. His postcranial remains, however, had deteriorated significantly. Burial 10's first cervical vertebra was intact but all of his other vertebrae and ribs that were present in 1969 had completely decomposed. The left femur and both tibiae were present and sufficiently preserved for examination and analysis.

Burial 10's remains were analyzed in the field following standard anthropological methods (Buikstra and Ubelaker 1994; Moore-Jansen et al. 1994; Paleopathology Association 1991) and referencing appropriate paleopathological sources (e.g., Aufderheide and Rodríguez-Martín 1998; Ortner 2003). Burial 10's bones and teeth indicated that he was of European descent and, at about 18–20 years old, was the youngest of the 25 men discovered in the cemetery. (It is possible that Burial 10 was Henri Beaufort, an apprentice apothecary who was 21 years old when he sailed for New France in 1604. According to J.S. Pendery (2012), a will that he filed before embarking indicates that he was one of Dugua's colonists but his fate after 1605 is unknown). Skeletal lesions indicated that Burial 10 was suffering from an active systemic infection, sinusitis, and scurvy. In cases of prolonged scurvy the gingival tissue may swell to the point that it obscures the anterior teeth and blocks the passage of food and even liquids into the mouth. Because of the excessively swollen gum tissue, the settlement's surgeons had cut away part of the roof of Burial 10's mouth, including all of the anterior teeth. Evidence of healing indicated that Burial 10 had survived this crude surgery.

In addition to the evidence of surgery, Burial 10's cranium clearly presented the results of the standard transverse craniotomy cut that the settlement's surgeons had made through his head (Fig. 2.3). A large fragment of the frontal that had been cut through during the autopsy lay in the center of Burial 10's fragmented facial bones when he was originally excavated in 1969 (Fig. 2.2). Together with this fragment, analysis of the cut marks visible across his cranial vault allows for an accurate reconstruction of this young man's autopsy. The surgeons had begun Burial 10's craniotomy by either turning his head completely to the left or possibly by laying him prone and then detaching his scalp from his cranium. This was done by making incisions across the back and along the sides of his head using a thin-bladed instrument similar to a modern scalpel. These incisions produced a series of thin (less than 0.5 mm) transverse cut marks observable across the external surface of Burial 10's occiput, located superior to the external occipital protuberance and slightly to the right of the midline (Fig. 2.4). The surgeon then used a thicker saw blade to cut through the cranium. The surgeon had removed Burial 10's calotte with some skill; although several false starts or directional readjustments were present the cut margin was remarkably straight. No pathological lesions were present on the endocranial surfaces.

Fig. 2.3 Left lateral aspect of Burial 10's cranium presenting transverse autopsy cut

Fig. 2.4 Posterior aspect of Burial 10's cranium showing fine incision marks made with a thin-bladed knife to remove the scalp and the wider cut mark resulting from use of a cranial saw

In his descriptions of the autopsies at Saint Croix Island, Champlain made no mention of opening the crania or examining the brains of the scorbutic men. Perhaps Burial 10's swollen mouth or the infection of his maxillary sinus compelled the group's surgeons to perform an autopsy that focused on his head. His ribs were not sufficiently preserved to determine if he had been subjected to one of the postcranial autopsies that Champlain described. None of the other 24 individuals excavated at St. Croix Island presented evidence of cranial or postcranial autopsy incisions. Assuming that Champlain was accurate in his reporting, the taphonomic effects of burial most likely obscured the evidence of the autopsies since the ribs of most of the individuals were too poorly preserved to identify such cuts if they had been present. There also is no documentary or skeletal evidence that any of the men had been embalmed; it is likely that the bodies of those who had died during the winter were stored, frozen, until the ground thawed in the spring of 1605.

Discussion

Human remains that reflect the early history of autopsy and dissection are not common in the archaeological record. The mummified body of a man dissected between ca. 1200 and 1280 is currently the earliest example of a human dissection (Charlier et al. 2014). The next oldest iatrogenic specimens in Europe are sawn cranial fragments dating from the late fourteenth to the sixteenth centuries recovered from a crypt in France (Valentin and d'Errico 1995). Closer in time to the autopsies conducted at Saint Croix Island, the bodies of the Medici family entombed in Florence provide numerous examples of craniotomies and thoracic autopsies conducted between 1574 and 1614 (Fornaciari et al. 2008).

While autopsies and dissections were likely performed as early as 1503 at Santo Domingo (present-day Dominican Republic) and at Mexico's first hospital beginning in 1523, in continental North America the autopsies that Samuel de Champlain described at Saint Croix Island are only the second ones recorded by Europeans (Hektoen 1926; Jimenez 1977). The first European autopsy in the New World for which a definitive report is currently available was conducted on 19 July 1533 at Santo Domingo. Performed on the remains of newborn conjoined twins, its purpose was to determine whether the twins Joana and Melchiora Ballestero shared one soul or possessed separate ones (Chavarría and Shipley 1924; Jimenez 1978). The local Roman Catholic priest apparently needed this information to determine how many postmortem baptisms were required. Despite clearly demonstrating that two distinct individuals were represented by the remains, the twins' father reportedly refused to pay for two baptisms.

The first autopsy in continental North America was reported by the French explorer Jacques Cartier, whose barber-surgeon Samson Ripault conducted it in 1536 at their settlement located near modern-day Québec City. Performed on Phillip Rougemont d'Amboise, a 22 year-old seaman whom they believed had died of scurvy, the autopsy results are recorded in an account thought to have been written by Cartier himself and first published in 1545:

> And because the disease [that had caused Rougemont's death] was a strange one, the Captain [Cartier] had the body opened to see if anything could be found out about it, and the rest, if possible, cured. And it was discovered that his heart was completely white and shriveled up, with more than a jugful of red date-colored water about it. His liver was in good condition but his lungs were very black and gangrened; and all his blood had collected over his heart; for when the body was opened, a large quantity of dark, tainted blood issued from above the heart. His spleen for some two finger breadths near the backbone was also slightly affected, as if it had been rubbed on a rough stone. After seeing this much, we made an incision and cut open one of his thighs, which was on the outside very black, but within the flesh was found fairly healthy (Cartier 1924[1545]:207–208).

These autopsy results are very similar in structure to those at Saint Croix Island described by Champlain in the book that he published 68 years later, strongly suggesting that Champlain was familiar with Cartier's account. Although autopsies may have been conducted by Spanish, French, or English surgeons in North America prior to 1600, the autopsies at Saint Croix Island in 1604–1605 are the earliest ones for which skeletal evidence now exists. The next oldest skeletal evidence of autopsy in North America is an occipital fragment with saw marks discovered in trench fill dating between ca. 1611 and 1617 at Jamestown, Virginia (Kelso 2006:166–168). The first autopsy in the American colonies for which documentary evidence exists was performed in Salem, Massachusetts in September 1639 on the body of an apprentice boy who allegedly was murdered by his master. Although no detailed report has survived, court records note that the postmortem examination had revealed "a fracture in his skull, being dissected after his death" (Winthrop 1853:384).

The discovery of Burial 10's autopsied remains provides a unique opportunity to explore the practice of Renaissance medicine in the New World. Beyond their medical aspects, from a biocultural perspective his remains also reflect the changing attitudes toward the body adopted by Europeans beginning in the thirteenth century, promulgated through the Reformation in the 1500s, and continued afterwards as the European colonies were established in the Americas. In particular, the autopsies at Saint Croix Island raise the issues of social organization, inequality, and marginalization of the settlers at the colony.

The Saint Croix settlement resulted from a business agreement between Pierre Dugua and King Henri IV; Dugua recruited and chose the men, Catholic and Protestant, who would populate the new colony and, serving as their unelected leader under the royal grant that he had received in 1603, decided how to set up their new society. Unlike colonies established later in the century by European governments, Dugua represented a joint-stock company whose shareholders expected profits in return for their investments (Biggar 1901). It was his responsibility to supply the colony; maintain order among men of various social classes including several French noblemen and fellow investors who had accompanied the voyage; plan the colony's defenses; create an effective administrative system; and motivate, reward, and discipline the laborers who constructed the colony's buildings, planted and farmed their crops, and procured food by hunting and fishing. As described by Diamond (1961:5), Dugua and his company needed to "utilize existing institutions—

religion, family, land tenure, law—and to adapt them, under government auspices, to the objectives of the planners and the needs of an immigrant population under frontier conditions." In effect, Dugua and Champlain transmitted the royal, quasi-feudal society of Renaissance France to the New World, including its inherent class distinctions, inequalities, divisions and labor, and religious tensions. Indeed, as part of their agreement King Henri IV required Dugua's company to transport 100 colonists every year to New France. Gentlemen (Champlain used the French term *sieur* when writing his books) were not expected to perform physical labor and, in fact, each brought several servants with them on the voyage to Saint Croix Island.

Autopsy and dissection were acceptable to the Renaissance Church and commonly practiced in Europe as well as the colonial New World. By the fourteenth century the ecclesiastical debate regarding the integrity of the body and resurrection of the soul had been generally resolved; the dead body was no longer considered sacred and could be opened for various reasons. Prioreschi (2001:229) argues that in the late Middle Ages "The body was thought to be particularly ignoble and contemptible because, in addition to belonging to the material world, its sins and impure desires added obstacles to the fulfillment of the spiritual destiny of the soul." Given this theological position, the concept of the separation of the body and soul had been established to the degree that, at least in the cases of saints, royalty, and members of the elite, dismemberment as part of funerary preparations was a customary practice. Indeed, according to Brown (1990:831) in post-medieval Christian society "Burial intact was alleged to serve the interests of individual resurrection. Division, on the other hand, was thought to promote prayers, remembrance, and salvation, and also to preserve and commemorate family ties." The distribution of body parts for interment in multiple locations thus allowed an individual to "lie close to a number of relatives and spouses to await with them the final resurrection" (Brown 1990:831). There remained a significant difference, however, in attitudes towards the types of postmortem examinations—autopsies were acceptable since they were performed privately but dissection was shameful since the naked corpse was publicly displayed (Park 2009). In the cases of criminals and other socially disgraced people, the loss of personal dignity associated with dissection was viewed as the final punishment for offenses against God and society, with little respect accorded the corpse.

These attitudes towards the body are reflected in the autopsies ordered by Cartier in 1536 and Champlain between 1604 and 1609 in New France. Aware that the practice had been acceptable for more than three centuries, it is likely that neither leader faced significant moral obstacles when making the decisions to order the autopsies. To them, and the priests that traveled with them, the body and soul were separate and the desperate search to find an effective remedy for the diseases that were killing their colonists outweighed any religious opinions to the contrary. There were differences, however, in how Cartier and Champlain memorialized the autopsied men.

In the book that he published in 1545, Cartier specifically stated the name, age, and hometown of the sailor (Phillip Rougemont) whose body he had ordered to be autopsied. After describing the results of Rougemont's examination, Cartier (1924[1545]:207–208) also makes a point to note "Thereupon we buried him as well as we could. May God in His holy grace grant forgiveness to his soul and to those of all the dead." In this passage Cartier, a practicing Catholic, recognized the importance of respectful interment even for common sailors and draws a clear distinction between the body and the soul. Some 60 years later, when Champlain and Lescarbot published their respective books about New France, neither name the men who were autopsied or distinguish them as gentlemen, sailors, or workers. Particularly for Champlain, baptized as a Protestant but later a convert to Catholicism, the dead men had been transformed into "some of the bodies" or "a few bodies" that were instruments used by his surgeons to save other colonists from the ravages of scurvy.

Champlain was aware of the class differences among the settlers; writing in 1613 about the prevalence of scurvy at his colonies he commented that "At first we thought that it was only the workmen who were struck down by this sickness: but we have seen that this is not true" (Champlain 1925 [1613]:61–62). Likewise, Lescarbot (1911 [1609]:260), also a Catholic, reflects ancestral and class differences when he described only as "a negro" the man autopsied during his voyage to New France in 1606. It appears that, at least in their memoirs, both Champlain and Lescarbot marginalized the men who had been autopsied by ignoring their identities and saying nothing about the final dispositions of their remains. In stark contrast, Champlain marginalized the leader of the criminal conspiracy against him at Québec City in 1608 by specifically naming the leader of the plot, Jean Duval, in his 1613 book, detailing Duval's execution, decapitation, and the display of his head on a pike. In this case, Champlain's behavior was consistent with the socially acceptable devaluation of the criminal body through postmortem mutilation and public exhibition.

The question of whether or not Champlain and Dugua would have ordered autopsies of any of the gentlemen if they had died at Saint Croix Island in 1604–1605, or subsequently at Port Royal, is best answered by considering the long tradition of autopsies and embalming of the elite members of French society. In fact, in 1559 King Henri II died after a broken lance pierced his right eye during a jousting tournament; both Andreas Vesalius and Ambroise Paré attended and wrote about his postmortem examination (Martin 2001). Fifty-one years later King Henri IV, Champlain's and Dugua's own royal patron, was autopsied the day after he was assassinated in May 1610 in Paris (Le Floch-Prigent et al. 2009). No doubt aware of this well-known custom, it is probable that the gentlemen too would have been autopsied if any of them had died at Saint Croix Island France. Whatever social conventions separated the classes or the Catholics from the Protestants back home, at the colonies in New France they likely would not have extended into the realm of postmortem examination.

Conclusion

Regardless of Burial 10's social standing or faith, whoever oversaw his interment at Saint Croix Island took the time and care to ensure that his corpse was intact by returning his separated calotte to its correct position, either before or as he was laid to rest. Perhaps it was the surgeon, the colony's priests, the men who lowered

Burial 10 into his grave, or even Champlain and Dugua; it is likely that no one will ever know. Underscoring the ineffectiveness of the autopsies, however, Champlain (1922 [1613]:306) noted that “Our surgeons were unable to treat themselves so as not to suffer the same fate as the others.” They presumably were buried in the little cemetery at Saint Croix Island together with their deceased patients, explorers all in their strange New World and, like the body of Andreas Vesalius, unmarked but now not forgotten.

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Chapter 3
Evidence for Early Seventeenth-Century Surgery and Dissection at James Fort, Virginia

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Introduction

Jamestown, established in May 1607 by a private company of investors, became England's first successful transatlantic colony. Located on a 1500-acre island in the James River, the initial settlement was based in and around a triangular palisade encompassing about one acre of land that the colonists named James Fort (Fig. 3.1). The Fort endured as the colony's administrative center until the investors' Virginia Company lost its royal charter from King James in 1624. After this date, settlement intensified on the rest of the island and more widely along the James River.

Early Jamestown colonists were primarily commercial and industrial specialists sent by the Virginia Company to demonstrate "that Virginia could provide profitable freightage for the ships of England" (Craven 1957, 12). Also included were gentlemen who hoped to profit privately from the venture, trained soldiers, general laborers, and individuals providing support services such as blacksmiths, coopers, men of the cloth, and medical practitioners. The latter proved to be especially needed as high numbers of the early colonists were afflicted with injuries and illnesses. In the words of colonist George Percy writing in 1607, "Our men were destroyed with cruel

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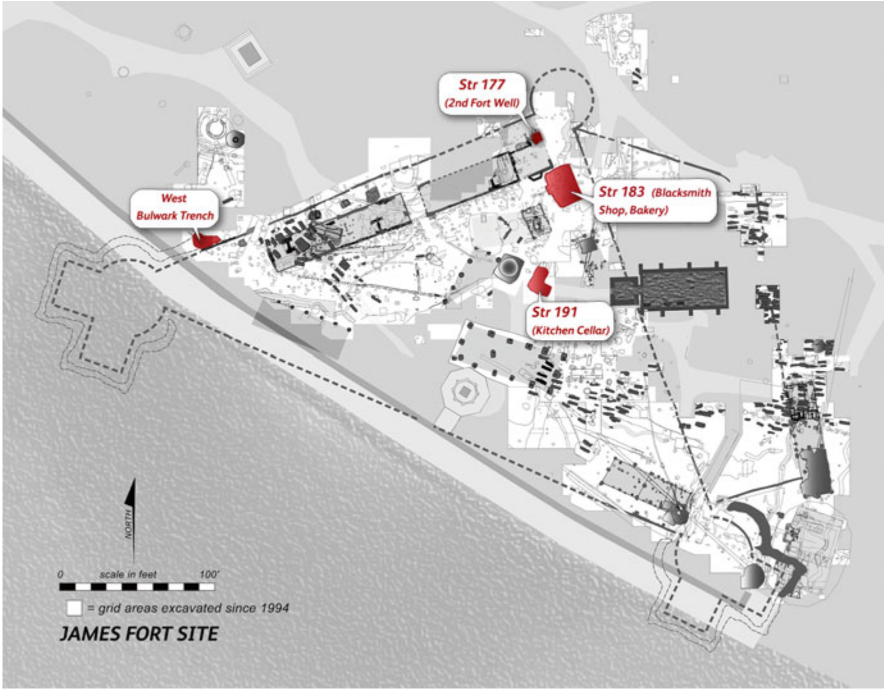

Fig. 3.1 Archaeological plan of James Fort as of February 2015, indicating three features dating between 1610 and 1617 that contained partial human crania. Structure 191 contained the partial remains of a cannibalized English female (image: Jamestown Rediscovery)

diseases as swellings, fluxes, burning fevers, and by wars" (Percy 1967, 25). The mortality rate was so high that the colony was only sustained by periodic arrivals of new settlers sent by the Virginia Company.

Three medical men were part of the first voyage to settle Jamestown. Five more arrived on the first two supply ships 8 months later. The two physicians, four surgeons, and two apothecaries embodied the tripartite nature of the healing profession during the early seventeenth century.

Physicians comprised a small medical elite cadre of university graduates. Their education in philosophy, theology, and the arts as well as the sciences prepared them for the role of "dietician, spiritual counselor and general confidant" as they regulated the body's overall health (Rawcliffe 1995, 12). Trained in humoral theory, the physician's usual practice was to examine a patient's urine to assess imbalances in the four fundamental principles of the body—yellow bile, phlegm, black bile, and blood. Dietary modification, bloodletting, and medicines produced from botanical substances were normal treatments for restoring humoral balance.

Walter Russell, identified by Jamestown leader Captain John Smith as a gentleman and "Doctor of Physicke," arrived in the colony in January 1608 (Smith 1986a [1624], 161). Russell was part of a June 1608 exploration of the Chesapeake

Bay and on this trip treated Smith for an agonizing stingray puncture by applying "a precious oile." Smith recovered from his pain sufficiently to eat the stingray for dinner, but "having neither Surgeon nor surgerie but that preservative oile" on the expedition, decided to return immediately to Jamestown where there were at least two surgeons who could tend to his injury (Smith 1986b [1624], 228–229).

Apothecaries, medical men who distilled, powdered, and blended the restorative preparations prescribed by physicians, used culinary methods as well as processes involved in dyeing, alchemy, and metalworking (Rawcliffe 1995, 152). The Jamestown apothecaries may have provided remedies to the colonists, but, given the early drive for profit, likely spent considerable time exploring Virginia's flora for both new and proven medicinal substances. These were stored in hand-painted tin-glazed earthenware jars, a practice followed since the fourteenth century judging from period illustrations of apothecary shops. Scores of these jars have been found in James Fort and are the most common ceramic vessel form in the early settlement.

Like apothecaries, the third group of medical men, surgeons, received training through apprenticeship and were considered "craftsmen" in the medical community. Although socially inferior to university-trained physicians, surgeons had a solid economic base through their alignment with barbers, who were permitted to let blood and pull teeth as well as provide haircuts and shaves. The College of Physicians of London tried to control the activities of surgeons by prohibiting them from prescribing medicines and by dictating that physicians must be present during critical operations (Appleby 1981, 252). Surgeons were primarily restricted to the treatment of wounds, making them an integral part of military expeditions and voyages of discovery where injuries were commonplace. Surgeon Anthony Bagnall was included on the July 1608 exploration of the Chesapeake Bay to continue curing Smith's "hurt of a stingray." During that trip Bagnall also treated a Virginia Indian prisoner who had been shot in the knee during a brief skirmish (Smith 1986a [1624], 175).

Military campaigns far from home, whether on land or at sea, provided opportunities to the experienced surgeon to hone his craft and were training grounds for the novice hoping to advance a career. The latter was likely often the case at the remote and isolated settlement of Jamestown. Writing of the situation, William Strachey (1953 [1612], 37–38) stated that during the first decade of the settlement the sick were recovering

> by very smale meanes, without helpe of fresh dyett, or comfort of wholsome Phisique, there being at the first but fewe physique Helpes, or skilfull surgeons, who knew how to applie the right Medecyne in a new Country or to search the quality and constitution for the Patient and his distemper, or that knew how to counsell, when to lett blood or not, or in necessity to use a Launce [lancet] in that office at all.

Having the settlement serve as a medical "training ground" was likely to the detriment of the colonists, but may have been the only way to persuade medical men to join a risky endeavor, where "Without cities, hospitals, professional contacts, books or instruments, the early colonial doctors required a resourcefulness, an independence of action, courage and ingenuity, bred only in the school of real necessity" (Blanton 1930, xvi).

Skeletal Evidence

While artifacts recovered at Jamestown attest to the early presence of medical practitioners mentioned in the settlement's historical documentation, human skeletal evidence for the practice of their craft, specifically surgery, is rare. Archaeological investigations by Jamestown Rediscovery have resulted in excavations of over 100 early graves located in and around the fort. Most are intact, discrete interments, but some burials were disturbed while the site was occupied. Later burials cut into or overlay early interments, while colonial era ditches, pits, roads, buildings, and the 1861 construction of a Confederate Civil War fort also disturbed and redeposited human remains. To date, no skeletons excavated from these intact or disturbed graves show evidence of surgical intervention.

Less frequently, isolated skeletal elements unrelated to formal graves have been found in sealed trash deposits dating to the early years of James Fort. The colonists' trash appears to have been periodically consolidated and redeposited into abandoned pits and cellars during the ongoing construction and remodeling of the Fort throughout the settlement's first two decades. Recent excavation of a kitchen cellar (Structure 191) led to the discovery of an English female cranium, mandible, and proximal tibia among debris deposited just after the "starving time" winter of 1609–1610 (Horn et al. 2013). Butchering marks on the bones provide clear physical evidence for survival cannibalism during this time of extreme deprivation. Prior to that discovery, three partial crania without evidence of cannibalism were found in trash-laden, pre-1617 fill. One was in each of the three separate early fort features: a bulwark trench, the cellar of a work building, and a well. All three crania represent male colonists and two display mortal injuries. Cuts on one of the crania match those made by medical tools from a seventeenth-century surgeon's chest. Forensic and contextual details for these remains, along with associated artifacts, suggest their possible retention by Jamestown surgeons instead of burial with the bodies from which they came.

JR1425C

Undisputed evidence of surgical intervention is exhibited by this well-preserved section of a posterior cranial vault (Fig. 3.2). Attached fragments of parietals are joined to a larger segment of occipital along the lambdoid suture, 6 cm on the left side and 7 cm on the right side. The entire piece has a maximum, diagonally aligned measurement of 14.5 cm, a maximum transverse width measured 1 cm above the external occipital protuberance of 12.2 cm, and a maximum vertical height in anatomical position of 11.5 cm, as measured to the right of lambda from the right parietal apex to the inferior margin of the occipital.

A moderately prominent external occipital protuberance and a raised, well-defined, nuchal ridge identify this individual as a male. The lambdoid suture is partially obliterated ectocranially and fully united endocranially, suggesting that this was

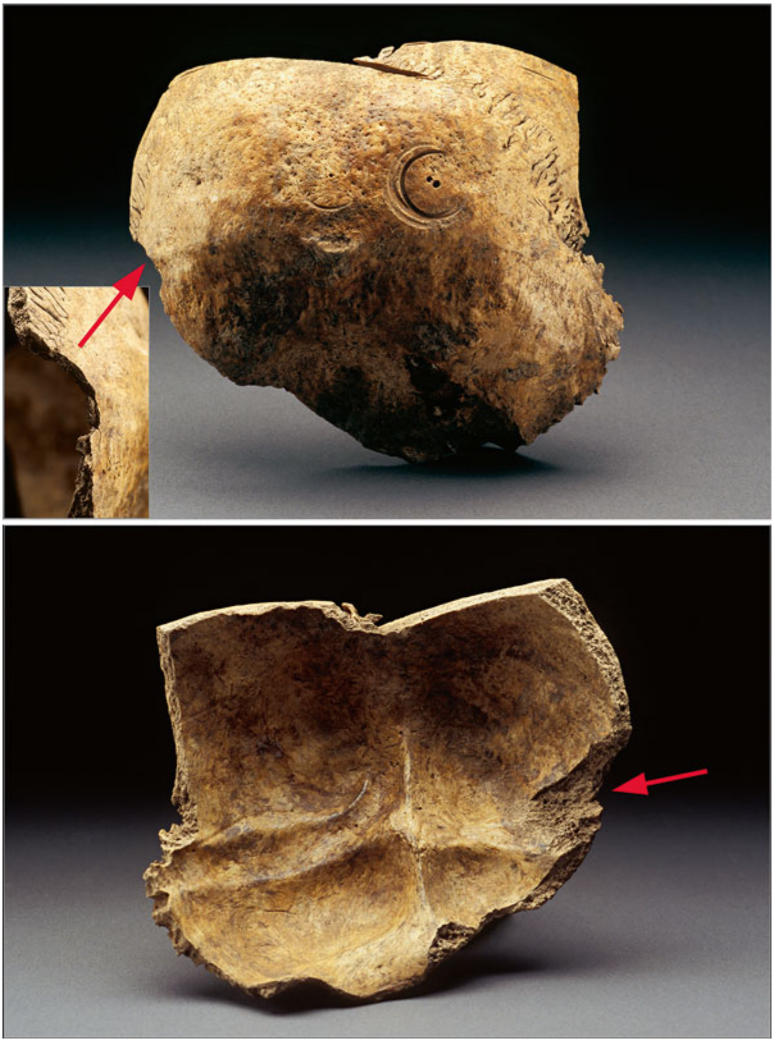

Fig. 3.2 The posterior vault of a cranium (JR1425C) recovered from an upper fill layer of the west bulwark trench of James Fort. A perimortem impact fractured the lower left parietal and occipital at the level defined by the inferior nuchal line (*top left inset*). The external margin at the impact site (*upper left*) is sharply defined and internally there is marked beveling (*bottom*: *arrow*). Superior and infero-medial radiating fractures extend away from the opening (image: Smithsonian Institution)

probably a middle-aged adult. Elevated lead levels in the bone were detected through X-ray fluorescence (XRF). The presence of this heavy metal indicates exposure to lead in life, likely from using lead-glazed earthenware and pewter spoons, plates, and drinking vessels. At Jamestown, this identifies the man as a European immigrant since the Virginia Indians had no access to lead before European contact (Aufderheide et al. 1985).

This male sustained at least two mortal blows to the head. One impact involved the lower left parietal and occipital behind the ear at the level defined by the inferior nuchal line. Radiating fractures extend superiorly and infero-medially from this location low on the head, a region likely unprotected by the metal helmets worn during this period. The presence of a radiating fracture in the right posterior parietal suggests another deadly injury to the right cranial vault. The partially defined left parietal impact has a sharp external margin. Internally, there is marked beveling with loss of inner table and diploe. The defect margin, although limited, suggests that it resulted from a forceful impact by an elliptical object with a striking thickness of at least one centimeter or more. The wound was likely inflicted by something similar to a celt, a heavy lithic woodworking tool used by the Virginia Indians (Kelso 2006, 167). A number of these tools have been found in Fort excavations, presumably dropped by Natives working for the colonists or representing trade items.

The occipital squamous above the superior nuchal line additionally has cuts from two failed attempts at trephination with a circular, saw-toothed blade known as a trephine (Gross 2003, 310; Kirkup 2003, 300). One attempt was made in the midline above the protuberance, and another is evidenced by two slightly deeper, overlapping circles about 2 cm away (Fig. 3.3). Cut diameters are 15 mm with a central guide perforation. Both attempts were aborted.

Trephination, whereby a piece of bone is surgically removed to prevent pressure from brain swelling and a buildup of fluid in the cranial cavity, is a centuries-old procedure for head injuries (Arnott et al. 2003; Porter 2002, 109). Surgeons also

Fig. 3.3 Circular saw marks made during the attempted trephination. The mark on the *left* is defined by a single circular cut, while the mark on the *right* shows multiple cuts from “skipping” and repositioning the saw (image: Smithsonian Institution)

used the opening in the cranium to extract broken pieces of bone forced inward toward the brain during injury (Martin 2003, 324).

An example of a well-executed, completed colonial trephination is seen in a Revolutionary War soldier excavated from the Williamsburg, Virginia gardens of the eighteenth-century governor's palace (Hume 1963; Ragland 1990 [1931]). This cranium (Fig. 3.4) has a circular opening from a trephination placed near a perimortem fracture in the left parietal. The perforation diameter is 20.5 mm and four fine scalpel cuts extend away from the margin. The circular cut margin of the trephination is discolored like the outer table and has "softened edges." The rounding of the edges may have resulted from postmortem handling of the cranium, but based on contemporary craniotomies, the initial rounding of the inner and outer edges of this trephination may also suggest early-stage remodeling, which normally takes 3–6 weeks to

Fig. 3.4 Left lateral view of a Revolutionary War soldier's skull from Colonial Williamsburg. The completed trephination was along a perimortem fracture in the left parietal (*upper left*). Conservation material used after recovery to fill a nearby hole in the bone was digitally extracted in the computed tomography image (*upper right*) (image: Smithsonian Institution)

occur (Dr. Stephen Rouse, pers. comm. 2014). Only the skull and upper vertebrae were examined, as the rest of this skeleton was reburied soon after excavation.

While this soldier's cranium and other historic documentation identify trephination as a long-standing, accepted procedure for head trauma, especially in response to battlefield head injuries (Beaumont 1965), the marks from the trephination in the Jamestown cranial piece are unlike those recorded for the Revolutionary War soldier. The trephination in the Jamestown cranium was attempted in the thickest part of the skull and not directly associated with the traumatic injury. Anatomically, this was the least optimal site for a successful operation. The location of the cuts and hesitancy reflected in the skips and jumps of the saw suggest the work of an inexperienced surgeon. Even if the practitioner had been experienced, he probably would not have been able to save the colonist's life. By the eighteenth century it was recognized that cranial injuries of this type were basically inoperable by the standards of the time and that trepanning the *Os Occipitus* in these cases was both impractical and unnecessary since the injuries would soon result in death (Sharp 1769).

It is easy to understand why the trephination procedure was not successful on the Jamestown colonist and therefore aborted, but why are there also saw marks (Fig. 3.5) to remove the superior portion of the cranial vault? A surgical or dissection cut that involved sawing through the posterior vault with the deceased positioned face-down progressed by sawing from posterior to anterior along two different

Fig. 3.5 Cuts in the superior aspect of the cranial piece reflect removal of the vault cap with a cranial saw. Striations on the cut surface indicate directionality of the blade (*upper left*). The right cut edge has a broken inner margin due to incomplete separation using the saw. False starts are also evident in the outer table (image: Smithsonian Institution)

angles of cutting. The left parietal was sawn completely through in a roughly transverse-inferior orientation and the cut involved both the left parietal and superior occipital apex at lambda, with a total represented length of 6.4 cm. Right parietal sawing followed the left, as the inner table has a raised edge that was fractured as the superior cranium was levered off to complete the dissection. The right saw cut produced a straight edge measuring 5.7 cm in length. Minor cuts made by the saw or a knife are evident on both parietal fragments and the right medial lambdoid suture. The saw blade width was approximately 0.7 mm.

Experienced English surgeon Woodall suggested that the "Head-sawe" could at times take the place of the trepanning saw to make a "vent … through the Cranium" in the treatment of head wounds. He warned "young Artists" (i.e., apprentices) not to be too aggressive with this tool, as accidents could happen (Woodall 1978 [1617], 7). Woodall's contemporary, Ambroise Pare, a French surgeon, also espoused the use of "small sawes … to divide the scull" in the event that the cranium is fractured and depressed on one side (Pare 1975 [1631], 20). The surgeon at Jamestown may have abandoned the trephination once he found how difficult it was to complete and in desperation progressed to a head saw, ultimately failing to save the patient.

Another more likely possibility, again implicating the work of an apprentice surgeon, is that the straight saw marks indicate a postmortem craniotomy related to dissection or autopsy after death. This scenario is not unlike that proposed by archaeologist Ivor Noël Hume for the trephined Revolutionary War soldier. Based on excavation notes, the soldier's upper and lower arm bones were amputated as were both legs below the knee. The lower leg bones were placed on top of the arm bones and torso in the grave (Ragland 1990 [1930]). Hume (1963, 187–188) wrote: "The only possible explanation seems to be that the unfortunate soldier died on the operating table and remained there to become a student surgeon's chopping block." Given that as early as the sixteenth century dissection was considered central to medical training in Britain (Boston and Webb 2012, 43), at James Fort a young surgeon may have used the circumstances to learn more about human anatomy and to hone his skill with the cranial saw. Woodall encouraged young surgeons to practice. In this regard, and in reference to trephination, he wrote that while the trephine is "an instrument of great consequence … it is seldom well used …" and advised young practitioners to practice on a calf or sheep's head until he could safely use the tool on a man (Woodall 1978 [1617], 3–6). The possibility that this cranium was a "practice" piece for using the trephination tool as well as a study subject of dissection was considered, but since the trephination attempts were not completed and evidence of head trauma was apparent, it seems more likely that the procedure was performed in response to the severe injury.

Loss of the patient and subsequent dissection allowed for separation of the fractured bone piece from the rest of the cranium. Whether the surgeon simply disposed of it, or retained the piece for further study, it was eventually discarded separately from the body and unearthed in 2003 from the defensive trench that extended along the exterior palisade from the west corner bulwark of the fort (see Fig. 3.1). The west bulwark was strengthened under Governor Thomas Gates between 1611 and 1614 (Hamor 1615, 22), and the trench was extended at that time, incorporating a possible sawpit outside the palisade wall. The 14′ long trench was filled in over the next few years, with alternating levels of organic fill, wash lenses, and intentional backfill, rich in artifacts typical of Jamestown's early fort contexts (Kelso and Straube 2008, 3–8).

Notable in the fill with the cranial piece is a nodule of sulfur, a nonlocal substance that had multiple medical uses during the seventeenth century. In 1617, London surgeon John Woodall (1978, 112) claimed that sulfur (brimstone) was used to treat coughs, itching, ringworm, colic, scurvy, and epilepsy. The trench fill also contained numerous ceramic sherds, many of which mended with sherds found in other pre-1617 fort features, thereby establishing a temporal relationship with them. Significant among these are crossmends between the bulwark trench fill and the deposit from the second Jamestown well (Structure 177) described later in this chapter as also containing a partial cranium.

JR2361C

This fragmented human cranium comprised of the frontal, parietals, and occipital squamous (Fig. 3.6) does not show evidence of surgery or dissection, but does display unusual perimortem trauma. Articulating, open, cranial sutures, slight definition of the meningeal artery impressions and cranial bone thickness identify the remains as those of a young adult. Development of the supraorbital ridge at glabella, blunt superior orbital rims, and a slightly raised nuchal ridge classify the remains as male. Stable carbon and nitrogen isotope values ($\delta^{13}C = -19.25$; $\delta^{15}N = 10.83$) indicate that this individual was a recent immigrant, likely of non-elite status. The stable carbon isotope value reflects a wheat-based, European diet with no evidence of maize, similar to those reported for seventeenth-century English colonists in the mid-Atlantic (Ubelaker and Owsley 2003). The nitrogen isotope value indicates a moderate level of dietary protein.

This cranium has multiple injuries. Damage includes a small perforation measuring 6 mm by 3 mm in the left mid-frontal. Bone surrounding the perforation is weathered with minor outer table cracking and erosion. An irregular fracture extends 20 mm from the defect superiorly and obliquely toward the left. The defect's right inferior edge has a shallow divot of missing bone. This elliptical gouge extends 7.5 mm from the edge of the opening, and is 3 mm wide, and 1 mm deep. A second, similar gouge is located 9 mm above and to the left of the mid-frontal perforation. Collectively, the perforation and two gouges form a semilunar-shaped defect that appears to have been produced during a single event. The frontal bone's endocranial surface shows no erosion and minimal beveling of the perforation's internal margin. The outer table radiating fracture is visible internally and extends obliquely from the perforation margin for 25 mm. The cause of the frontal perforation and adjacent gouges is unknown but likely due to trauma.

A more defined injury from an edged implement is located above the left eye orbit 9 mm superior to the fronto-malar suture. The impact site is characterized by

Fig. 3.6 Partially reconstructed broken cranial vault (JR2361C) reassembled from 17 pieces. The frontal, parietals, and occipital have separated along sutures. The fragmented left parietal was not fully reconstructed in the region of perimortem damage. This bone has two small circular punctures (*lower right*; *arrows*) representing a probable perimortem impact that is the origin of the radiating fractures. There is slight warping along the fracture lines. A penetrating, elliptical, V-shaped, gouge (*lower left*, *arrow*) is located superior to the fronto-malar suture on the left side. Postmortem damage from in situ contact with a metal gridiron is visible on the occipital and posterior parietals (image: Smithsonian Institution)

a penetrating, elliptical, V-shaped, gouge. This fracture, measuring 15 mm medial-lateral by 6 mm superior-inferior, with a depth of 3 mm, bisects the temporal line. The defect's superior margin is straight-edged, while the inferior aspect is irregular from apparent twisting of the blade upon impact.

Old perimortem breaks defined by linear, dirt-filled radiating fractures with darkly colored margins are evident in the left parietal, represented by 12 articulating bone fragments. An impact fracture is characterized by five of these bone pieces; the two smaller anterior fragments represent the probable impact location and origin of the radiating fractures. Upon impact, the two small parietal fragments were depressed inward, creating a slightly beveled endocranial margin. Ectocranially, the two smaller pieces form a roughly oval area of breakage measuring 43 mm by 20 mm. The inferior edge of the oval break is formed by a perimortem fracture line that extends to the coronal suture. The posterior margin of the oval break is represented by a superiorly directed radiating fracture that terminates at the sagittal suture. Along the lower half of the superiorly oriented fracture are two, small, circular defects measuring approximately 6 mm in diameter. One defect is located at the posterior corner of the impact site at which point the radiating fracture line is directed superiorly. The second is 15 mm superior to the inferior defect. These two gouges in the middle of the left parietal represent perimortem damage from a single blow. The nearly complete right parietal shows no such damage and is represented by two bone pieces separated by an old postmortem break.

The occipital is represented by a large piece of squamous, an articulating small fragment from the right, superior lambdoid border, and a third small piece from the left superior lambdoid border. This last fragment articulates at the lambdoid suture with a small piece of left parietal. The infero-lateral portions of the occipital are broken off and missing, damage that is old, such that only the posterior margin of the foramen magnum is represented. Fracture margins on either side of the foramen magnum are discolored and embedded with dirt.

Breakage in the superior occipital represents more recent damage defined by slightly depressed, incompletely detached, fragments of the occipital and left posterior parietal. An iron oxide concretion adheres to the surface delineated by cracking and appears as a V-shaped defect on the posterior left parietal. Endocranially, radiating fracture lines resulted from inward compression of the occipital and parietal near lambda. This postmortem deformation and breakage were caused by contact pressure from an incomplete metal gridiron discarded with the remains.

All bones comprising this partial cranium were recovered from the same upper fill soil layer of an early two-room cellar (Structure 183). The frontal bone pieces, separated along the coronal suture, were recovered about 2 ft from the parietal and occipital fragments. The building cellar, aligned with the fort's east palisade wall (see Fig. 3.1), first served as a multipurpose workshop. It was then modified into a camp kitchen after the "starving time" and after the backfill of the previous kitchen, Structure 191. This cellar was backfilled in 1617 when the new governor, Samuel Argall, constructed an addition to the traditional governor's residence in the north corner of the fort (Kelso et al. 2012, 7–26).

The cellar's fill held a range of colonial detritus that was both military and domestic, including weaponry, tools, ceramics, and personal items, as well as the faunal material from both wild and domestic animals that is characteristic of a post-"starving time" deposit (Kelso et al. 2012, 7–27; Bowen and Andrews 2000). Two copper English patent farthings produced in 1613 were in the fill and provide a date after which the materials were discarded in the cellar. No other human bones besides the partial vault were found in the cellar fill, and despite evidence of perimortem trauma there is no indication why the remainder of the cranium is missing. A possible surgical lancet included in this same deposit may hold a clue. This partial vault may have been retained by the surgeon, eventually ending up as part of a medical discard, similar to the fate of the trephined cranial piece. Crossmends between this cellar deposit and the bulwark trench have not been identified. However, crossmends between this cellar deposit and fill from the second James Fort well (Structure 177), which contained a third partial cranium, have been found, loosely linking all three deposits.

JR2158X

Fill from the second James Fort well (Structure 177) held a partial human cranium comprised of three articulating sections of bone. One piece contains the frontal, nasals, malars, maxillae, palatines, and sphenoid; the second is a separate, but complete, left temporal; the third is the basilar occipital including the condyles and anterior foramen magnum. Bone separation occurred primarily along the open coronal, spheno-temporal, and squamosal sutures. The sphenoid and basilar occipital broke through the dorsum sellae. No perimortem trauma is evident.

The well-preserved anterior cranium (Fig. 3.7) represents a male colonist aged 16–18 years based on development of the maxillary dentition and formation of the left third molar socket. Six maxillary teeth are present including the left first and

Fig. 3.7 A partial cranium (JR2158X) comprised of three articulating sections of well-preserved bone recovered from the fort's second well (Structure 177) (image: Smithsonian Institution)

second premolars and first molar, and the right second premolar and first and second molars. All other teeth were lost postmortem and the right third molar is missing due to agenesis. Only the right first molar has slight occlusal wear with beginning dentin exposure. Moderate calculus deposits are present on the facial surfaces of the teeth and the right second premolar has a small cavity.

Anomalous bone conditions include trace porosity in the roof of the left eye orbit and slight deviation of the nasal septum with asymmetry of the inferior nasal border. Facial morphology, in addition to stable carbon and nitrogen isotope values similar to the previously described individual from Structure 183, identifies this young man as a recent European immigrant.

This square, wood-lined well, dug near the north bulwark around 1611, interpreted as the fort's second well, was situated as far from the brackish James River as possible within the triangular-shaped fort. It is located approximately 25 ft northwest of Structure 183 (see Fig. 3.1). By 1617 Argall's addition to the governor's house was built over the well, which must have been filled in shortly before construction (Kelso and Straube 2008, 56–63). Ceramic crossmends relate the well to other early fort contexts. The well contained tobacco pipes of local manufacture and one of Bermuda limestone. Arms and armor in the fill included a halberd relating to Lord De La Warr. Both the halberd and limestone pipe date the well to the period after the 1610 "starving time" when new leaders arrived at Jamestown (Kelso and Straube 2008, 63–69).

Layer JR2158X was located about 10.5 ft into the well, at the modern water table. In addition to the partial cranium, it yielded artifacts that included ceramics, a tremendous amount of faunal material, both native and domesticated, and surgical tools including a tooth extractor and a pair of forceps (Fig. 3.8). Given the excellent state of bone preservation, it is perplexing that only these three cranial pieces were deposited in the well. Equally perplexing is the discard of the surgical tools. These valuable implements appear unbroken. The likely explanation relates to the colony's high mortality, which included medical practitioners. Surviving colonists uninformed as to the use of these abandoned objects, both the medical tools and human bone specimens, would have had little reason to retain them.

Alternatively, while it is unlikely that the surgeons discarded their instruments, the medical men themselves may have disposed of the bones during their service. Historically, medical schools, military field hospitals, and hospitals and doctors in general were known to unceremoniously dispose of "medical waste" in informal, practical ways. In Britain, disarticulated human bones were archaeologically recovered alongside animal bones and discarded earthenware in the basement of the old Ashmolean Museum in Oxford, which served as a site for anatomy demonstrations and lectures in the late seventeenth and early eighteenth centuries (Boston and Webb 2012, 60). The moat at Oxford Castle also was found to contain seventeenth-century human remains with evidence of dissection. It appears that the bodies were used for medical teaching and training and then were returned to the castle, the site of the gallows, for disposal (Ibid., 55). Over 3000 faunal and human bones were recovered from a densely layered pit associated with a private anatomy school in London run by anatomist William Hewson in the late eighteenth century (Kausmally 2012, 72). In the United States, medical waste pits from the Civil War and War of 1812 have been documented to contain amputated limbs of multiple individuals

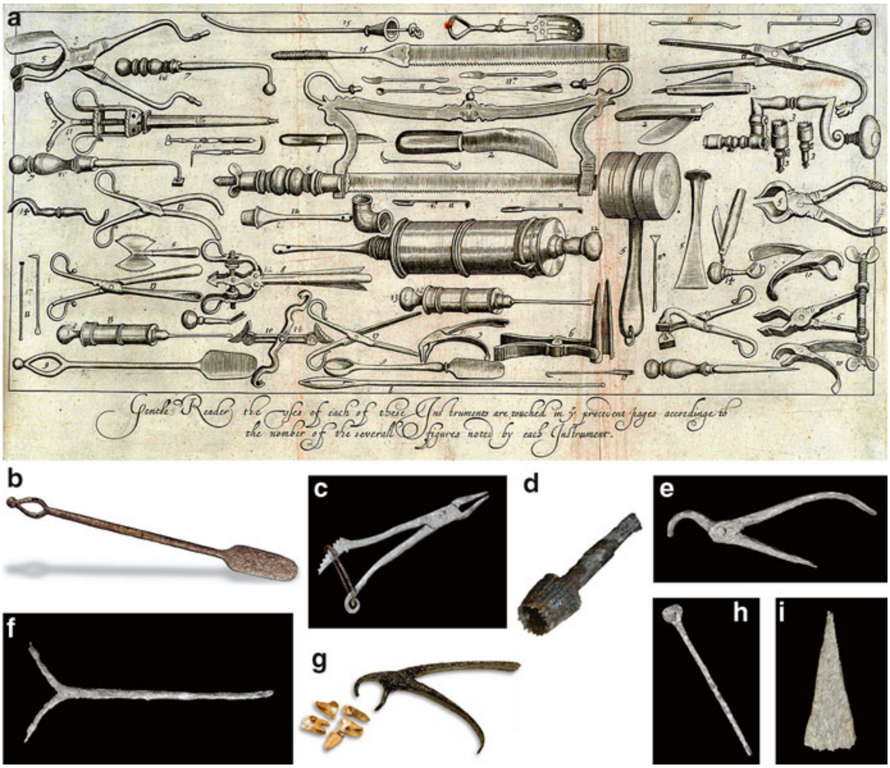

Fig. 3.8 Illustration of equipment for surgeons' chests of the East India Company, from John Woodall's *The Surgeons* Mate, first published in 1617 (**a**) (courtesy of University of Bristol Library Special Collections). Below are medical tools recovered from James Fort and a trephination saw similar to that referenced in the text. From *top left* to *right*: (**b**) Spatula mundani (447-JR), James Fort Pit 3, *c.* 1610, L 135 mm. John Woodall claims to have personally devised this foot-long surgical implement used to remove fecal impactions. (**c**) Locking forceps (3783-JR), James Fort Structure 177, *c.* 1611–1617, L 178 mm. An adjustable mechanism clamps the jaws tightly to the body or to a foreign object that is being removed from the body. (**d**) Trepanning saw (41-GS), Sandys Site, *c.* 1630–1650, L 72 mm. The trepan consists of a crown saw on the end of a brace. A central pin, missing in this saw, helps to center the blade as it is drilled into the skull. (**e**) Nippers (2770-JR), James Fort Structure 145, seventeenth century, L 135 mm. This tool was useful to the surgeon for removing gangrenous or otherwise damaged fingers and toes. (**f**) Terebellum (3066-JR), James Fort Unplowed Strata, seventeenth century, L 137 mm. A bullet remover, this threaded rod was twisted into pieces of lead lodged in the body. (**g**) Dental forceps with extracted teeth (3812-JR), James Fort Structure 177, L 132 mm. Woodall suggested that surgeons carry two sizes of forceps for "drawing of teeth." (**h**) Surgical scraper (3673-JR), James Fort Bulwark Trench, *c.* 1607–1614, 138 mm. This instrument was used to make small incisions in skin and gums and to scrape teeth. (**i**) Chisel (3572-JR), Plowzone, seventeenth century, L 158 mm. Woodall suggested that if the surgeon had no room in his chest for this amputation tool used in conjunction with a wooden mallet, he could borrow one from the carpenter

(Goff n.d.; Owsley et al. 1991). Wells or "sinks" and burial pits in basements have been documented as clandestine disposal areas for bodies and body parts that were part of nineteenth-century teaching and medical school training (Blakely and Harrington 1997; Harrington and Blakely 1995; Chap. 7). Trash pits, and even privies, have been documented as physicians' disposal locations for body parts. A privy in Annapolis dating to the nineteenth century associated with a Dr. Frank Thompson (Site 18AP44) contained two sections of femora with marks reflecting dissection and/or experimentation with amputation techniques (Mann et al. 1991). A circa 1830 privy in Alexandria, Virginia, associated with a local physician contained a human skull that had been used as an anatomical specimen based on drill holes for mounting hardware in the left and right sides of the frontal (Owsley and Bruwelheide, unpublished report on Alexandria specimens, on file in the Dept. of Anthropology, National Museum of Natural History). Human anatomical specimens have also been recovered from two different eighteenth-century disposal locations in Williamsburg, Virginia, that were not graves (Chap. 4). It is to be expected that James Fort surgeons also sought practical ways to dispose of remains.

The cavalier treatment of these remains may not only reflect convenience, but might also attest to the status of the individuals they represent. Since Henry VIII's reign, bodies of criminals sent to the gallows in England were offered to anatomists for dissection as postmortem punishment (Mitchell 2012; Richardson 2000). It is possible that these practices carried over to Jamestown, which had enacted a period of strict martial law following the 1609–1610 starving time winter. Formal burial would likely not have been granted to criminals convicted of harsh crimes, but rather their bodies disposed of unceremoniously. Differential postmortem treatment may have resulted in their remains becoming part of the general detritus of the settlement, particularly during the chaotic first decade of the fort. This practice may have continued at Jamestown into the latter half of seventeenth century. Well 19 in the New Town area of Jamestown Island contained "a nearly complete human left leg and left half of the pelvis" (Cotter 1994, 157). The well was associated with c.1662 row houses, part of which served as a jailhouse (Carson et al. 2006, 111). It has been suggested that the remains found in the well are from a "rebel or criminal" who "had been hanged, drawn, and quartered" (Cotter and Hudson 1957; Horning 2001, 93–94), but the bones show no physical evidence of such treatment.

Jamestown's First Surgeons and Their Tools

Surgeons were present at Jamestown intermittently during the first decade of settlement when the three colonists under discussion perished. Two surgeons, gentleman Thomas Wotton and William Wilkinson, arrived with the first settlers in May 1607 and comprised the surgical team for the first 8 months. Wotton appears in the historical records through authors who present differing opinions about his competence. Captain John Smith credits "his skillful diligence" for the recovery of "most of the souldiers" (Smith 1986a [1624], 143). In contrast, Edward Maria Wingfield, the settlement's first president, not only refused to provide Wotton with money for drugs and other supplies, but he also denied the surgeon's request to reside on the pinnace anchored in the James River rather than in the fort. Wingfield claimed that Wotton was not properly ministering to the many "men lyeing sick & wounded in our towne" by living offshore (Wingfield 1993, 341). Wotton escaped the "unhealthy humors" of Jamestown by returning to England, as he is recorded as participating in a voyage to the East Indies in 1635 (Blanton 1930, 7–8).

Less is known about William Wilkinson; he may be the "willm wilson" mentioned in a 1609 Virginia Company document as a colleague of George Lisle (Kingsbury 1906–1935, III: 23). Lisle was an apprentice to London surgeon John Woodall, and sent by him to Virginia in 1609, as Wilkinson may have been sent earlier. Woodall, appointed Surgeon General of the East India Company in 1612, was involved with the Somers Isles Company that settled Bermuda and with the Virginia Company. In addition to sending apprentice surgeons to Jamestown, in 1609 and 1625 he sent chests of "Cheurgery sufficiently furnished" (Kingsbury 1906–1935, III: 23; Minutes 1916, 65).

In 1617, Woodall published a textbook entitled *The Surgions Mate* to guide new and inexperienced surgeons assigned to transatlantic expeditions in the use and efficacy of medicines, treatments, and medical instruments. A plate in this book illustrates the various tools in the surgeon's chest and some of these implements have been recovered with the partial crania under discussion and from other pre-1617 features in James Fort (Fig. 3.8). These artifacts were likely part of Woodall's 1609 gift sent with apprentice George Lisle.

The fleet of ships sailing to Jamestown in 1609 was broken apart by a hurricane with one of the vessels, the *Sea Venture*, wrecking upon the Bermuda reefs. Lisle and his medical chest were probably aboard the *Sea Venture* and did not reach Jamestown until May 1610 since Captain John Smith claimed that he had to leave Jamestown after suffering from a severe gunpowder burn in September 1609 "because there was neither Chirugian or Chirugerye in the Fort to cure his hurt" (Smith 1986a [1624], 223). New governor, Sir Thomas Gates, was also aboard the *Sea Venture* and was carrying instructions from the Virginia Company for the return of two surgeons (William Wilkinson and Post Ginnat) previously sent to the colony (Kingsbury 1906–1935, III: 23). Smith's assertion that there were no surgeons in the fort in 1609 suggests that these two men were among the dead by this time. This is further supported by a description of colonist George Forrest's death at Jamestown in that year. He lived 6 or 7 days with "seaventeene Arrowes sticking in him, and one shot through him" until he died "for want of Chirurgery" (Smith 1986a [1624], 221).

It is not known how long surgeon George Lisle remained in the colony but he appears to have been back in England by October 1616 when, having completed his apprenticeship with Woodall, he was admitted to the Worshipful Society of Barber Surgeons (The Worshipful Company of Barbers, pers. comm. 2012). The only other man with medical training documented in the colony during this early period is Dr. Lawrence Bohun who arrived as the personal physician of the new governor Thomas West III, Lord De la Warr, in June 1610. Bohun was educated by "the most learned Surgeons and physitians in the Netherlands" (Brown 1890, 830). Bohun remained in the colony for only 10 months before De La Warr's failing health necessitated their return to England (Brown 1890, 478–480), leaving Lisle as the fort's surgeon. Based upon the dates of the archaeological features and the period of time that George Lisle was likely in the colony, he might have been the apprentice surgeon who attempted the trephination on the colonist's cranium found in the bulwark trench.

Conclusion

The circumstances of these three discoveries support their identification as possible medical discards from the first 10 years of James Fort. None of the three partial crania are from formal burials, but were recovered from fill within sealed fort deposits, dating between 1611 and 1617. The deposits are loosely linked to one another by crossmends of ceramic sherds and medical tools and objects were found in each of the three deposits. All three crania represent male colonists and two display evidence of perimortem trauma. One of these, the trephined bone piece, has clear evidence of surgery followed by removal of the superior vault, likely dissection.

Jamestown's harsh reality of settlement coincided with a period of fluorescence and change in the English medical profession. Physicians, apothecaries, and surgeons were all vying for authority to administer human health. It was a time of experimentation and growth in medical treatments and theory, with an emphasis on human anatomy. Surgeons participated in these developments and improved their professional skills by journeying to remote locations. Their stories, and those of the individuals they served, are represented by these Jamestown remains and evidence yet to be discovered.

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Chapter 4
A Dissection at the Coffeehouse? The Performance of Anatomical Expertise in Colonial America

Ellen Chapman and Mark Kostro

Introduction: Dissection as a Public Drama and Private Inquiry

On November 24th, 1738, in Williamsburg, Virginia, an Executioner was attempting to hang indentured servant Anthony Francis Dittond for murder, but the rope broke and the condemned awoke to plead for the prayers of the assembled spectators and ministers. During the second try Dittond was successfully executed, but this was apparently not the full extent of his punishment. As the Virginia Gazette reported, “His Corps was put into a Coffin; and we hear it is to be anatomized by the Surgeons” (Parks 1738; Dargan 1934). Unfortunately, there are no further news reports clarifying whether the dissection was in fact carried out.

While the Dittond case is the only reported dissection in Williamsburg, it is unlikely to have been unique. Eighteenth-century Williamsburg was not just the Virginia Colony’s administrative and judicial center, it also boasted a very healthy and competitive medical economy. Moreover, material evidence of an anatomical dissection or autopsy event was recently found during an archaeological investigation of Richard Charlton’s coffeehouse. This chapter presents the historical and archaeological evidence for a semiprivate dissection in Williamsburg during the 1760s, and contextualizes such dissection events as public punishments, examples of elite consumption, and spectacles of medical competition.

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In the first half of the eighteenth century, punitive dissections of executed criminals like Dittond were part of a range of sanctioned public spectacles used to deter behaviors that particularly challenged the social order. Other Virginian examples of this practice include the 1736 case of an enslaved Nansemond woman who killed her mistress and was sentenced to be burnt at the stake, and an enslaved man from Orange County whose decapitated head was displayed at the Courthouse in retribution for killing his owner (Dargan 1934, 13–14). Punitive dissection was ultimately codified in the 1751 Murder Act as a way of distinguishing particularly heinous capital crimes during a time when even minor thefts could receive a death sentence (Tarlow 2010, 67–68). As Virginia transitioned from a colony to statehood, a similar approach to dissection as punishment can be seen in Governor Thomas Jefferson's proposed *Bill for Proportioning Crimes and Punishments in Cases Heretofore Capital*, which stated that "If any person commit Petty treason, or a husband murder his wife, a parent his child, or a child his parent, he shall suffer death by hanging, and his body be delivered to Anatomists to be dissected" (Boyd 1950, 492–507). The bill, however, did not pass, and as a result dissection was largely illegal in Virginia until the commonwealth's first anatomy law in 1884 (Halperin 2007, 493; Savitt 1978).

Another motivation for dissection was the development and replication of medical knowledge through the examination of pathology and anatomical instruction. For this reason, public dissections were encouraged in a limited fashion by individual municipal and sovereign powers. During the sixteenth century, King James of Scotland donated one body annually to the Edinburgh Guild of Surgeons and Barbers (Hildebrandt 2008, 6). Edinburgh's town council in the late seventeenth century agreed to provide Alexander Monteath, a member of the Surgeons' Guild, with the bodies of individuals who perished in the town jail or foundling hospital (Hildebrandt 2008, 7).

The questionable legality and social unease surrounding dissection has been extensively explored in scholarly research (e.g., Richardson 2000, 75–99; De Costa and Miller 2011; Sappol 2002; Tarlow 2010). Contemporary religious teachings differed regarding how scattered or damaged bodies would be restored during the Resurrection, but contrary to some secondary sources, people in early modern England did not believe that transgressions against a body imperiled the individual's soul (Tarlow 2010, 33–38; contra Myrsiades 2009, 35, 50–65). There was, however, a particular unease associated with the conflict between popular and scientific conceptions of death processes and the human body at the time, one that was not limited to religious justifications but also included the significant power differential between physician and dissected. As Sarah Tarlow has argued, "To be an anatomist was to have total knowledge and thus total control, but to be the dissected subject of anatomy was to be fully exposed, to relinquish all secrets and all privacy" (Tarlow 2010, 75). Growing concerns with bodily privacy also influenced aversion to dissection, as did fears regarding incompetent medical care and premortem dissections. One example of the latter is the 1746 publication of *The Uncertainty of the Signs of Death, and the Danger of Precipitate Interments and Dissections, Demonstrated* by Jacques-Bénigne Winslow. Thomas Jefferson owned a copy of this work, which provided examples of miraculous awakening after death and a number of necessary

Fig. 4.1 Photograph of a Colonial Williamsburg re-enactment of *The Anatomist* (courtesy of The Colonial Williamsburg Foundation)

precautions to prevent people from being entombed while still living (Gilreath and Wilson 2010, 45).

While grave-robbing was still very rare during the eighteenth century compared to the nineteenth, growing demand for dissection subjects by English and Scottish medical schools drove an increase in the practice. Stories of the discovery of bodies of acquaintances on the dissecting table aroused general horror, particularly tales in which admired individuals were exhumed by the resurrectionists who supplied anatomy schools with fresh cadavers. In one particularly famous example, the noted author of *Tristram Shandy*, Lawrence Sterne, died in London in 1768 and was recognized on a Cambridge dissection table a few days later (Hughes 2003).

British subjects in Williamsburg observed and participated in performances that reinforced this social stigma and critique of corpse-greedy surgeons. In 1752 and again in 1768, the Virginia Company of Players performed a play in Williamsburg called *The Anatomist: Or The Sham Doctor* (Fig. 4.1). Written in 1697 by English playwright Edward Ravenscroft (1654–1707), the show was a farce. However, it also served to acknowledge and replicate common anxieties regarding the callousness of surgeons and their private anatomical dissections (Cregan 2008). Through their popularity, *The Anatomist* and similar works reveal the gulf in the eighteenth century between how medical professionals viewed dissection and how lay populations, particularly working class people, understood it.

In the colonies, cadavers to be used for anatomical instruction were most often retrieved from graveyards of enslaved and free blacks, the potter's fields used for burials of the unknown or indigent, and institutions like almshouses and jails

(Humphreys 1973; Sappol 2002). In Boston in 1733, students successfully petitioned for the body of "Julian the Indian Man, who was executed" (Sappol 2002, 100). Similarly, the journal of an apprentice surgeon in Massachusetts indicates that poor individuals who lacked family attachments were vulnerable to dissection regardless of whether they had perpetrated a crime (Thompson 2010, 90–92). Evidence from the New York African Burial Ground suggests occasional autopsy or partial dissection events, some of which that may indicate the reclaiming of bodies from late eighteenth century medical education contexts (Perry et al. 2009). During this period, black residents of New York repeatedly petitioned for the cessation of grave-robbing in their burying ground and took part in the New York Doctor's Riot to protest use of black corpses for dissection (De Costa and Miller 2011; Blakey 1998). While evidence for racial selection of patients and cadavers is much more apparent for the antebellum period than it is for the mid-eighteenth century, the considerable proportion of enslaved Africans in Williamsburg is likely to have been a major source of bodies for dissection and study. By the 1760s, the town's population had reached nearly 2000, approximately half of whom were enslaved (Hellier 1989; Tate 1965). As Savitt has recognized, "Blacks were considered more available and more accessible in this white-dominated society: they were rendered physically visible by their skin color but were legally invisible because of their slave status" (Savitt 1982, 332). As a result, by the 1830s black bodies were routinely used for medical experimentation, and proximity to black patients and cadavers was a factor that significantly influenced where medical schools were founded and how successful they were (Washington 2006, 58–59; Savitt 1982, 333–335).

In contrast to dissection for purposes of anatomical study or research, autopsy was a much different event and occupied a very different position in the eighteenth century, legally, socially, and spiritually. They were performed to assess cause of death, to assess wrongdoing when foul play was suspected, or to assess pathology (especially if an epidemic or unusual disorder was suspected). One famous Virginia case of autopsy was that of George Wythe and his free black ward, Michael Brown. Both were fatally poisoned with arsenic in 1806 by Wythe's ne'er-do-well nephew. Wythe survived Michael Brown by several days, and requested that his ward be autopsied to assess whether they had been poisoned. As his condition deteriorated, Wythe made a request for the doctors to cut him. This was interpreted as a desire for his own body to be autopsied as well, which was done a few days later (Aitken and Aitken 2014; Theobald 2013). In another instance, Governor of Virginia Francis Fauquier stipulated in his will that his body could be used for scientific research if he died of undetermined causes (Hayes 2008, 102). Compilations of autopsy notes were common texts for medical research and study; major collections by French physician Joseph Lietaud (1703–1780) and Swiss doctor Theophile Bonetus (1620–1689) numbered several thousand cases and were widely used for medical research (King 1958, 1991). In the late eighteenth century, the French physician Bichat emphasized that both autopsy and dissection were essential elements of the role of physician; dissection provided essential anatomical knowledge and surgical skills, while necroscopy allowed examination of disease progression (King and Meehan 1973). Part of the growing significance of autopsy and dissection during the eighteenth century may have been that they permitted direct observations that offered a way forward for a scientific practice that at the time was fractured and uncertain. Galenic ways of understanding the body through the proportions and balance of humors had fallen out of favor, and in their place were an unsynthesized group of theories that focused on the mechanisms of the body, including Boerhaave's theory of solidism and Harvey's description of the circulation (Myrsiades 2009, 34).

In theory, the disparate goals and contexts of autopsy and dissection may allow these practices to be distinguished from one another in the archaeological record. Autopsies were performed on individuals for whom a customary burial was planned, so their autopsied bodies were more likely to have been left intact than dissection subjects. Furthermore, autopsied individuals would typically be buried in cemeteries whereas the final resting spots of dissection subjects are less certain. Often the dissected remains are substantially or completely fragmented, and tend to be disposed of in a covert manner. Finally, as autopsies were performed in the service of legal investigation, skilled doctors rather than students would have carried out the autopsies. The comparative archaeological evidence, however, is somewhat contradictory and distinguishing between dissection and autopsy is more challenging when only isolated remains are found.

While archaeological examples of dissected or autopsied human remains are much less common from the seventeenth and eighteenth centuries than the nineteenth, some discoveries provide context regarding the disposal of fragmentary human remains. In nearby Jamestown, Virginia, cranial fragments belonging to three separate individuals were recovered, all from different contexts dating between 1610 and 1617 (see Bruwelheide et al., Chap. 3). Two of the three examples have clear evidence for blunt force trauma and one of these contains several examples of trephination, suggesting that cranial fragments may have been removed during unsuccessful medical treatment. The archaeological context further suggests the remains were retained as medical specimens for a short period before being discarded as refuse along with other medical instruments. Occasionally, episodes of war may have provided limited opportunity for rapid medical learning and experimentation. In 1929, excavation of a Revolutionary War cemetery in Williamsburg identified several skeletons with amputations and one trephanation (Ragland, n.d.), described in further detail in Bruwelheide et al., Chap. 3. In England, eighteenth-century hospital refuse and medical training contexts in London, Oxford, and Newcastle contained a variety of dissected and autopsied human remains. These contexts included charnel pits in an infirmary burial ground, trash pits associated with ceramic vessels and faunal remains, and pits of human remains at a private residence (Chaplin 2012; Chamberlain 2012; Boston and Webb 2012; Kausmally 2012). In cases where disposal of human remains was frequent, as at the private Craven Street anatomy school in London, layers of lime were laid down to hasten decomposition (Kausmally 2012, 72). These examples illustrate that in many cases, doctors disposing of isolated human remains did not share or respect the popular understanding of human remains as an essential representation of the deceased in mourning and funerary rites, but instead as the occasional refuse of their trade. The remainder of this chapter introduces the archaeological and skeletal evidence for dissection or autopsy in Williamsburg, and then provides historical and social context for this discovery.

The Archaeological Evidence for Dissection or Autopsy at the Williamsburg Coffeehouse

Fragmentary human remains in Williamsburg were recovered from a massive refuse midden associated with Richard Charlton's Coffeehouse, which stood on Duke of Gloucester Street adjacent to the Capitol Square. Popular in London and the American colonies since the late seventeenth century, coffeehouses were typically elite spaces and venues for a variety of cross-class commerce, debate, and socializing. They were also sites for lectures and public announcements, and dissemination of news, in addition to eating and drinking. Williamsburg was host to several coffeehouses in the early eighteenth century, but never more than one at a time. Charlton's coffeehouse opened for business around 1755 and operated until 1767, when Charlton applied for a license to be considered a tavern, and the building held that function until 1771 (Kostro et al. 2008).

As gathering places, and as clearinghouses for news and information, historians of early modern Britain have emphasized London's coffeehouses as centers of what Jurgen Habermas (1991) described as the "public sphere"—a unique social space in which distinctions of rank and status were temporarily suspended to allow uninhibited debate on public issues and moral virtues (e.g. Cowan 2008). In the American colonies, coffeehouses were likewise centers of philosophical discussion, gossip, political debate, and business engagement. Public performances and events also took place in colonial public houses—a notice from the Virginia Gazette in 1767 remarks on the delivery at Raleigh Tavern of "the celebrated LECTURE upon HEADS," a dramatic performance of a man speaking to papier-mâché heads that was wildly popular in colonial America (Garrett 1979; Purdie and Dixon 1767, 3).

From 1996 through 2009 the site of Charlton's coffeehouse was the focus of an extensive series of archaeological, architectural and historical investigations. The archaeological excavations revealed extensive evidence regarding the building's appearance and the nature of the surrounding landscape (Kiser and Mouer 1996; Kostro et al. 2008; Garden et al. 2001). Evidence of the building's layout reinforced its dual use as a convivial public house and an exclusive domain. The first floor included a public room intended for those interested in the consumption of hot and cold beverages, meals and general chatter, and a private room with fine furnishings that could be rented for exclusive events. These separated and defined spaces created a heightened sense of class differentiation in the coffeehouse, which itself was only open to white men, primarily landowning elites. Below the first floor, the building had a full-height cellar used as a cookroom that further distanced workers, probably enslaved Africans, from the refined spaces above (Chappell 2008). Above the public room, the upper floor "was clearly backstage space, conceivably used for all the mundane and illicit functions that taverns and coffeehouses commonly sheltered" (Chappell 2016).

The archaeological excavations recovered approximately 400,000 artifacts, and the rich midden north of the building was the source of substantial coffeehouse-related material (approximately 70,000 artifacts). The artifacts clearly provide details regarding what objects were being used in the coffeehouse and what sorts of food and beverages were being served and consumed. Artifacts relating to food preparation and service indicate that patrons were offered the latest table fashions, but less fashionable and less expensive vessels were also used to create the setting. The midden artifacts include items associated with the preparation and service of tea, coffee and chocolate in addition to alcoholic offerings such as beer, wine and punch (Ladd-Kostro and Kostro 2010). Meanwhile, analysis of the faunal remains suggests that patrons ate dishes that reflected an elite status; many animals were roasted and served whole, and a variety of prized wild species were offered (Bowen 2001).

Mixed with the discarded pottery, glass and animal bones, excavators also recovered several human vertebrae from the coffeehouse midden contexts. Three partial thoracic vertebrae exhibited modifications in the form of parallel cutmarks to the right dorsal transverse processes, revealed by examination with a hand lens. Three unmodified fragments, one from a thoracic vertebra and two from cervical vertebrae, were also recovered. In addition, there was also an intermediate hand phalanx that appears to have been modified for use as an articulated skeleton (Kiser and Mouer 1996). This object likely also played a role in the performance of medical expertise in Williamsburg, and historical and archaeological evidence for articulated skeletons in the town is reviewed in another study (Chapman 2016).

Because of the elements present in the Coffeehouse midden, most demographic information was unobtainable for these remains. However, the vertebral fragments exhibited non-fusion of the annular rings to the vertebral body, suggesting that the individual was between 14 and 18 years of age when they died, (Scheuer 2000, 211–213). No information regarding sex or ancestral affiliation could be determined based on the elements present.

A major question raised by these remains is whether they are more likely to be associated with a dissection of a complete cadaver, or whether they might be associated with an autopsy procedure to discern cause of death. The first fragment (18433-17KD171) consists of the right transverse process and lamina of a thoracic vertebra, probably T8 given the shape and angle of the inferior and superior articular facets. There are modifications to this bone fragment comprised of five fine cutmarks, likely from a scalpel or knife that extends supero-inferiorly along the right transverse process. Cutmarks appear to have a V-shaped cross section, are relatively shallow, and measure 2.5–8.9 mm long. One cut, however, was visibly thicker than the others and seems to have been responsible for a postmortem break in the bone midway along the right transverse process. The next element (19442-17KD202) is also a lower thoracic vertebra, probably T9, complete except that the spinous process has broken off adjacent to the lamina (Fig. 4.2). This element is modified by nine fine marks of similar orientation and length to that of 18433-17KD171. The longest cut, however, extended far enough into the trabecular bone of the right transverse process that it caused the process to break off. The last modified element (19036-17KD187) likely represents T10, and is in a similar state of completeness to the others. It is modified by five fine cutmarks, which again extend supero-inferiorly along the right transverse process and are of similar length and character to the other two elements. These modifications all appear to have occurred to the bones as they were oriented in anatomical position, through supero-inferior cuts using a fine knife or scalpel. The remaining three unmodified vertebral fragments represent small

Fig. 4.2 Elements 19442-17KD202 and 18433-17KD171 from the midden of Charlton's Coffeehouse (courtesy of The Colonial Williamsburg Foundation)

portions of an unidentified thoracic vertebra and two cervical fragments, one of them likely C7. None of the vertebrae exhibited any signs of traumatic injury aside from the cutmarks, and no other pathologies were observed.

On balance, the remains appear more characteristic of a dissection rather an autopsy event. The modifications are consistent with novice attempts to cut through the muscles and ligaments of the dorsal spine. Indeed, Hopper's The *London Dissector* from 1809 describes the challenges of dissecting the muscles of this area, explaining that the muscles of this region are packed closely together and often share fibers, making successful and neat differentiation difficult (Hopper 1809, 230–234). Unlike the Jamestown remains, there is no pathology observable on the small number of bone fragments recovered that might indicate a medical intervention or reason for autopsy. Furthermore, the physiology of this area makes it unlikely that these fragments of bone represent an attempt to perform a medical procedure on a living patient, or to practice such a procedure on a cadaver. While the Medical College of Georgia remains included examples of vertebrae that have undergone a laminectomy, a procedure to reduce swelling of the spinal cord, this procedure was first performed in 1887 and employed instruments much more substantial than these modifications suggest (Boos and Aebi 2008, 457; Uff et al. 2011). Dissection rather than autopsy is also supported by Boston and Webb's (2012: 74–76) suggestion that multiple nearby cut marks suggests multiple students practicing on the same cadaver; by contrast, autopsies were performed by more experienced physicians, who would not have been repeating procedures.

The single aspect of these remains less consistent with a dissection is that we have only a small number of elements represented in the sample. Unfortunately, during nineteenth century occupation at the site a cistern was excavated into the lot, which disturbed an unknown proportion of the midden deposit from which these human remains, and the modified phalanx, were recovered. However, it is unclear what proportion of a dissected individual we should expect to see after a Williamsburg dissection. Given the rare nature of dissections during the mid-eighteenth century, and the challenges to obtaining legal human remains for study and analysis, it is possible that many of the remains were retained by the person performing the dissection or individuals assembled to watch it. Preparation manuals available around the time demonstrate that wax injection molding of vessels and organs, maceration, preservation in spirits, drying, and plaster casts were all employed in order to save human tissues for further research and study (Kooijmans 2011; Pole 1790). Regardless, these remains appear to represent an unusual event in the Coffeehouse history. Contrary to other eighteenth and nineteenth-century contexts of private or university medical schools such as the Medical College of Georgia or London's Craven Street Anatomy School, there is not currently any evidence of repeated lime deposits or accretional assemblages of human remains (Kausmally 2012; Blakely et al. 1997). The remainder of this chapter places these remains into broader historical context, particularly relating to the practice of colonial medicine, public and private spaces for conducting autopsy, and the significance of the coffeehouse.

Colonial Medicine in Virginia

Interpreting dissection and autopsy in Williamsburg requires an examination of colonial medicine, particularly its educational and economic aspects. The eighteenth-century medical profession was a context in which traditional structures, such as the Apothecary Society and the Guild of Barber-Surgeons, had deteriorated (or were never present in the colonies), while the professionalization and technological advances of the nineteenth century were yet to be realized. While European medicine at the time appeared to be highly fragmented into different specialties, the small populations in the American colonies were insufficient to support this differentiation. Most successful doctors performed a combination of physician, apothecary, and surgical specialties, and often went into business together to defray costs (Cotner 2003, 12). On average, colonial communities generally contained one doctor for every 500–1000 members of the population in northern cities like Boston and Philadelphia (Rothstein 1987). In Williamsburg, where half of the population of 2000 on the eve of the Revolutionary War was enslaved, there were at least ten doctors known to be practicing in the decades leading up to the conflict. Medical practitioners in Williamsburg, including apothecaries, physicians, surgeons, druggists, chemists, and occasionally traveling medical specialists, competed very actively over patients. In one known example, prominent apothecary George Gilmer was forced to advertise in the Virginia Gazette to contest rumors that he had died or been forced to sell his stock due to financial difficulties (Gill 1972, 83). In a letter, physician James McClurg commented in 1790 that he saw "many of those who are continually engaged in common [medical] practice making little progress in the acquisition of fortune" (McCaw 1854, 7).

In general, while many physicians complained about the poor livelihoods available to them through medical practice in Virginia, access to training as a physician implied training overseas and was generally undertaken by men from prominent Virginia families. So many sons of Virginian gentlemen traveled overseas for their medical education during this time that they founded the Virginia Club at Edinburgh in 1761, where they performed practical dissections for each other and swore an oath "to practice medicine only, sell no drugs and perform no surgery" (Bell 1957, 60; Campbell 1840, xvii–xix). It is likely that many members abandoned this maxim once the economic realities in Virginia became clear to them. Intriguingly, however, their charter included several articles mandating regular presentations and attendance at demonstrations of anatomy, both animal and human. Additionally, many physicians had interests in shops or owned small plantations, so their medical practice was often not their primary source of support. Many of these men were also prominent in local politics and law, and were members of the gentry. For more applied fields (chemists, apothecaries, druggists), medical instruction in mid-eighteenth century Williamsburg centered around the apprentice system, while medical instruction overseas was essential for those wishing to practice as physicians or surgeons (Bell 1957, 50–54). In practice, evidence from other colonies such as Massachusetts suggests that European-trained doctors accounted for only around 10% of colonial medical practitioners, and that the understudied apprentice system impacted colonial medical treatment much more heavily (Thompson 2010). As a result of an over-subscribed field, the low population density of the colonial period, and the relative absence of guild or society training, demonstrations of surgical skills and anatomical expertise may well have been a powerful economic advantage. The next section discusses how the acts of dissection and autopsy were placed, spatially and socially, in eighteenth-century England and America.

Spaces of Dissection Performance

The eighteenth century was also a transitional time during which dissection continued to be a public spectacle in some spheres, while also developing as a focus of private study. In Britain, independent anatomy schools existed alongside formal medical schools, and anatomical lectures were performed in hospitals and other public contexts (Chaplin 2012, 99; Guerrini 2006; Rolleston 1939). The eighteenth century engraving by William Hogarth, The Reward of Cruelty, shows a public anatomy as the inevitable price for a violent and criminal life, and illustrates the event as one crowded by physicians and other onlookers (Fig. 4.3). Dedicated spaces for dissection in the form of anatomical theaters, which emerged in England during the sixteenth century, were relatively rare; in Great Britain, few theaters were located outside London, Edinburgh, Oxford, and Cambridge. Most of these spaces

Fig. 4.3 Detail from *The Reward of Cruelty*, an engraving published in 1750 by William Hogarth (courtesy of The Colonial Williamsburg Foundation)

were constructed and operated by guilds and societies. However, these spaces were clearly intended to welcome the public into the performance of the dissection, and aspects of their history illustrate the overlap between scientific anatomical presentations and dramatic, celebratory, or sensational performance.

Anatomy theaters and the public spectacle of dissections were part of a long history of performative anatomical presentations. Seventeenth-century architect Inigo Jones (1573–1652) designed both dramatic and anatomical theaters, and these spaces shared similarities; spectator viewpoint, classical statuary, and ceiling decorations (Nunn 2005, 111–114). The public interest in these events was intense, and in one instance, the London Barber-Surgeons agreed to rent land around their anatomical theater after land owners complained about the crush of onlookers pressed against the windows when dissections were going on (Nunn 2005, 6).

In the later American context, physicians and teachers similarly sought to develop their own public spaces to meet their needs of professionalism and public access; however substantial anatomy theaters were not a priority, particularly not during the eighteenth century. Philadelphia's early medical school included no dissecting room, chemical laboratory, and did not require required dissections courses when it opened in 1765—or indeed, until the nineteenth century (Corner 1965, 131). At Harvard, a disused chapel was used for anatomical dissections between 1810 and 1850 (Hodge 2013). At the University of Virginia, Thomas Jefferson did design an anatomical theater as a classroom for anatomical dissections and lectures, but only after the anatomy professor complained about his combined live-work space; this building was constructed in 1825 (Wilson 2009, 43–47).

Both private and public medical instruction were rare in the colonies prior to the Revolution, and only in Philadelphia and New York were medical schools founded during the colonial period. No human remains from comparable colonial contexts have yet been recovered archaeologically, but dissected human remains from the late eighteenth and early nineteenth century illustrate that faculty and anatomical instructors at America's early medical schools chose covert spaces under their control for the caching of fragmentary human remains from their anatomy lessons. At Harvard's Holden Chapel, a dry well constructed in the basement was used for disposal of dissected remains (Hodge 2013, see also Hodge et al. Chap. 6). In Richmond, Virginia, an abandoned well adjacent to the Medical Department of Hampden-Sidney College was used between 1840 and 1860 to deposit human remains and medical waste (Owsley and Bruwelheide 2012; Koste 2012, see also Owsley et al. Chap. 7). In the Old Medical College of Georgia Building, excavations in the basement (used between 1837 and 1912 for anatomical practicums) revealed a very dense assemblage of over 9000 fragments of human bone, along with animal bone, medical paraphernalia, and implements (Blakely et al. 1997). The context of the Williamsburg coffeehouse does not suggest the same degree of secrecy as these other examples, perhaps because the fragments are so small that they were unlikely to be recognized as human.

Discussion

Livingston (2010, 83–84) has argued that the coffeehouse, along with the public house, made up the "public sphere," albeit one restricted to an elite male public. In these spaces, the public's use of reason was reinforced through scientific lectures, experiments, debates, and promotions. Similarly, Habermas (1991, 60–84) has emphasized the importance of places like European coffeehouses as locations where the public—that is, the "bourgeois reading public of the eighteenth century"—developed as a powerful political actor. In some examples, this public sphere encouraged wealthy and middle-class opposition to tyrannical monarchies, enabling the French and American Revolutions (Habermas 1991; Conroy 1995). In others, scientific lectures and performances served to promote rational systems of taxonomy and classification, forming the justifications for hierarchies of government and bureaucracy as they were developing in the seventeenth and eighteenth centuries (Handelman 1998, xxx–xxxiv). Finally, the coffeehouses were also essential workplaces for merchants, brokers, insurance agents, political operatives, journalists, and a variety of other trades (Cowan 2008, 165–173). The sociopolitical significance of the coffeehouse and the context of eighteenth-century medical practice therefore suggest two important points regarding this dissection event.

Firstly, this dissection can be understood as a semiprivate elite consumption event, in which members of Williamsburg's medical community and other bourgeois men could learn anatomy firsthand and demonstrate their scholarly interests. The dissection provided an opportunity for the leading anatomist or physician to exhibit particular expertise, which would have provided a significant edge in Williamsburg's cramped medical economy. As Myrsiades (2009, 32) has previously argued, "The eighteenth century … is characterized by repeated dealings in a close-knit society where information is shared, past behavior known, and reputational capital valued." In the absence of regulation through legislation or guilds, a performance of this sort in the erudite atmosphere of the coffeehouse would have provided a powerful opportunity for such professionals to increase their standing in a complex web of personal relationships and reputation upon which their business was based.

Second and more broadly, the location of the coffeehouse associated the dissection with an embrace of medicine characteristic of the rational bourgeois public sphere. Just as Governor Fauquier and George Wythe embraced the (limited) use of their own bodies for legal or scientific discoveries, performing or witnessing a dissection offered Williamsburg elites the opportunity to reject the popular skepticism towards dissection represented by *The Anatomist* and *The Reward of Cruelty*. They did this on their own terms, of course, as men of their stature were unlikely to fall victim to grave-robbing or to be deposited like refuse as so many African-descended, institutionalized, or destitute individuals were. As a result, the positioning of this dissection event at the coffeehouse more closely represents elite and scholarly discomfort regarding democratic discourse at the coffeehouse (as per Cowan 2004) rather than more neoliberal conceptions of the coffeehouse as an egalitarian or truly radical space (Habermas 1991). The coffeehouse in this instance was likely being used in a way that was deeply distasteful to the majority of Williamsburg's public, and an anonymous body was consumed for the benefit of a group of men unlikely to experience the same fragmentation. Thus, on the eve of a revolution that would establish American freedom from British rule while embracing slavery, the rationality represented by the pursuit of anatomy in the coffeehouse was a similarly uneven one.

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Part II
Evidence from Public Cemeteries

Introduction

While there is only a single chapter in this section, there are actually several instances in which remains with evidence of postmortem examination have been recovered from public cemeteries (see Table 1.1). These stand in stark contrast to the institutionalized contexts discussed by the majority of the authors in this volume and thus can offer a valuable perspective on the analysis of dissection and autopsy. In each instance, only a small handful of individuals have been recovered that were subjected to postmortem examination. Therefore, these contexts and remains lend themselves to an osteobiographical approach that in turn can facilitate the contextualized discussion of the sociopolitics of race, inequality, identity, and personhood, exemplified by Shannon Novak's contribution (Chap. 5).

New York African Burial Ground

The African Burial Ground was a common source of bodies for medical schools in New York City (Sappol 2002). Marginalized and disenfranchised, African Americans, both free and enslaved, could not prevent resurrectionists and medical students from pillaging the burial ground. In 1787, a group of blacks petitioned the city's common council to stop the removal of the dead but were ignored. Grave robbing continued in the face of rising public concern and anxiety. The situation came to head on April 13, 1788, when, purportedly, a medical student waved a severed arm at passing group of children, one of whose mother recently died; inspection of her grave revealed that the body was missing. The resulting riot lasted for three days, during which the City Hospital was ransacked, medical students took refuge in the city jail, and six people were killed in confrontations with militia (Sappol 2002).

The African Burial Ground was excavated in 1991 and the remains of 419 individuals were recovered and examined. Blakey (2004) describes a single instance of craniotomy observed in a young adult male and while he does not go into great detail, it appears that the postmortem examination was limited to the circumferential cutting of the calvarium. This evidence, coupled with his interment in the burial ground, is suggestive of an autopsy. Given the history of grave robbing at the site it is tempting to identify this as a case of resurrection for anatomical study. It is difficult to explain, however, why the body would have been reinterred, holding his calotte in his arms. The sad reality is that black bodies appropriated for anatomy courses were most likely disposed of in a manner similar to that documented by Blakely and Harrington (1997), Hodge and colleagues (Chap. 6), and Owsley and colleagues (Chap. 7).

Old Frankfort Cemetery

In 2002, during construction of an office building in Frankfort, Kentucky, workers uncovered a portion of the Old Frankfort Cemetery. During the first decades of the nineteenth century, Frankfort experienced rapid population growth, with a large percentage of free and enslaved African Americans and German and Irish immigrants. This growth was fueled by Frankfort's location on the Kentucky River, agricultural and hemp production, and manufacturing. The area where the cemetery was located was at one point part of the neighborhood known as the "Craw," where Frankfort's poor and working class settled in the early 1800s. The site began as a small burial ground in the early 1800s, and all members of the community were likely interred there. The use of the cemetery intensified during the 1820s and became more strictly associated with the Craw neighborhood (Pollack et al. 2009).

Archaeologists recovered the remains of 242 individuals of African, European, and mixed ancestry. Paleopathological analyses of the remains indicate that they experienced poor childhood and adult health and physically demanding labor. Three individuals exhibited evidence of postmortem examination: a 40–44-year-old female of European heritage, a 35–39-year-old male of African heritage, and a 35–45-year-old male of mixed heritage (Killoran et al. 2009). In all three instances, the examination appears to be limited to a craniotomy, which based upon the criteria discussed in the Introduction would suggest that these individuals were autopsied.

Eighth Street First African Baptist Church Cemetery

The First African Baptist Church in Philadelphia was first established in 1810 at Tenth Street and Vine. Soon afterwards a schism developed in the congregation, leading to the "acknowledged" Tenth Street congregation and the "incorporated"

Fig. 1 *Left lateral view* of Individual #50 from the Eighth Street First African Baptist Church (Angel et al 1987) (Fig. 1 reprinted from Life stresses of the free black community as represented by the First African Baptist Church, Philadelphia, 1823–1841. Angel JL, Kelley JO, Parrington M, and Pinter S., American Journal of Physical Anthropology 74(2). Copyright (c) [1987])

congregation, first at Thirteenth and Vine (1817) and then at Eighth Street and Vine (1822). The cemeteries of both congregations were ultimately sealed by modern construction. Excavations of the Eighth Street cemetery occurred in 1983/1984 and recovered the remains of more than 140 individuals interred between ca. 1824 and 1842 while the Tenth Street cemetery was excavated in 1990 recovering the remains of approximately 89 individuals buried between ca. 1810 and 1822 (Crist et al. 1997). It was in the former cemetery that a single adult female was observed to have a craniotomy (Fig. 1).

In their analysis of the remains from the Eighth Street cemetery, Angel and colleagues (1987: 224) describe it in this manner; "One female has very marked hyperostosis frontalis interna, an endocranial neurological disorder, which probably led to her autopsy. We speculate that she may be Phoebe Peters (City of Philadelphia cemetery returns), who died suddenly in October 1841 from 'effects of habitual intemperance'." Crist colleagues (1997) also discuss this individual, providing some more detail on the procedure itself and confirming that it was limited to the cranium. These authors also suggest that given the behavioral symptoms associated with hyperostosis frontalis interna that she may have been "receiving treatment at a hospital or almshouse and had been autopsied for educational purposes or to confirm a diagnosis" (Crist et al. 1997:36).

Alameda-Stone Cemetery

The Alameda-Stone Cemetery in Tucson, Arizona was used by both the general populace as well as the military for approximately two decades in the mid- to late 19th century before the city expanded and it fell into disrepair. Military burials began in 1862 and ended in 1881 while civilian burials likely began sometime in the late 1850s/early 1860s and then ceased in 1875. Tucson was a frontier town that experienced rapid expansion during the time period when the Alameda-Stone Cemetery was in use, growing from 900 to more than 6000 between 1860 and 1880. While predominantly composed of Hispanics from Mexico, Spain, South America, and the Southwestern United States, the population of Tucson at the time was very diverse and included Euro-Americans, Native American groups, and African Americans. During the two decades it was in use, approximately 1800–2100 people were buried in the cemetery. While documentary evidence indicates that some efforts were made to relocate burials from the Alameda-Stone Cemetery to other locations, excavation of the site between 2006 and 2008 recovered the remains of 1386 individuals. Heilen and colleagues (2012: 146) report three individuals with evidence of postmortem examination (Fig. 2), including craniotomies in one Hispanic male and one Euroamerican male (there is no discussion of the third individual). Given that the remains were found in a public cemetery, coupled with the limited nature of the examination, the authors concluded that "autopsy is the most parsimonious explanation" for the evidence (Heilen et al. 2012: 148).

Fig. 2 Two of the individuals with evidence of autopsy recovered from the Alameda-Stone Cemetery in Tucson, AZ (Fig. 50 from Heilen et al. 2012).

Newburgh Colored Burial Ground

In 2008, the Newburgh Colored Burial Ground (1830–1870) was rediscovered during the renovation of the Broadway School in Newburgh, New York. The name of the cemetery is derived from an 1869 surveyor's map identifying a "colored burying ground." This marks the first historical reference to cemetery, though archaeological/documentary evidence indicates that the use of the site by Newburgh's African American population began ca. 1830. Before this, there were no cemeteries dedicated for black Newburghers; the city cemetery did not accept blacks and the African Methodist Episcopal Zion Church, established in 1827, had no cemetery. Blacks most likely had to be buried at the Newburgh Almshouse (established in 1814), which had segregated cemeteries for "negro," white, and "stranger." In 1831 the Almshouse was closed and this likely marks the beginning of the Burial Ground. Five burial permits were issued in the same year for interment at the "Western Avenue Cemetery (colored)." The land was sold by the city in 1873 in advance of a road extension and the remains were supposed to be reinterred at the Snake Hill Almshouse. Construction in 1905 and 1908, and renovation in 2008, of the Broadway School, however, uncovered human skeletal remains (Nystrom 2011).

A total of 99 individuals were recovered and analyzed with evidence of a postmortem examination observed in a single young adult female most likely of African descent (Figs. 3 and 4). The cranium was circumferentially cut, though

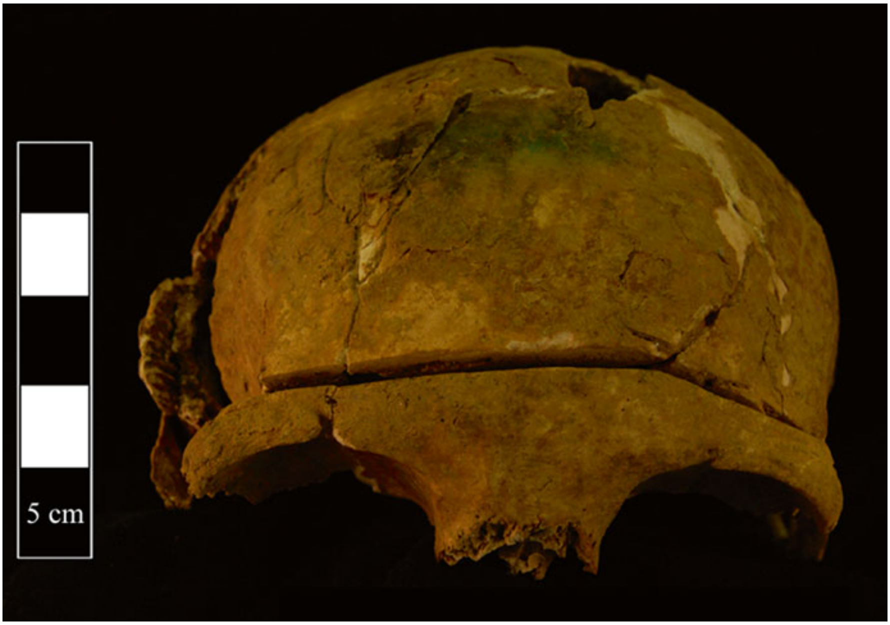

Fig. 3 Anterior view of Burial #95 from the Newburgh Colored Burial Ground (Figs. 3 and 4 reprinted from International Journal of Paleopathology 1(3–4), Nystrom KC., Postmortem examinations and the embodiment of inequality in 19th century United States, 164–172, Copyright (2011), with permission from Elsevier)

Fig. 4 Posterior view of Burial #95 from the Newburgh Colored Burial Ground. The "end" of the main cut (the cut that angles superiorly from the left) did not reunite with the "start" (the cut that angles inferiorly towards the right) (Figs. 3 and 4 reprinted from International Journal of Paleopathology 1(3-4), Nystrom KC., Postmortem examinations and the embodiment of inequality in 19th century United States, 164–172, Copyright (2011), with permission from Elsevier)

based on the direction and angle of the cut it likely did not make a complete circle. The main cut initiates inferior and lateral to the external occipital protuberance, continues across the right temporal and crossing the temporal line onto the frontal bone. There are several "re-orientation" marks as it crosses the frontal, through the left temporal line onto the left temporal and occipital. The cut angles superiorly, bisecting the external and internal occipital protuberances, terminating at the midpoint of the lambdoid suture, having not reunited with the initial cut.

The skeletal remains of Burial #95 were found in correct anatomical position and there appears to be no unusual mortuary behavior (e.g., orientation of the grave, position in the coffin) relative to the other interments. The postmortem examination seems to have been limited to the cranium and there are no skeletal elements missing. There is no archaeological evidence from the rest of the excavation of any broken coffins or any signs that may be indicative of "resurrection." There was no medical school in Newburgh at this time and while resurrectionists did range widely to supply anatomical specimens to New York City medical schools (Sappol 2002), it seems unlikely that the body would have been reinterred at Newburgh if this had happened. Given the limited nature of the postmortem examination, the archaeological evidence, and historical context, the most conservative conclusion is that this was an autopsy and was not explicitly for anatomical study.

Freedman's Cemetery

The Freedman's Cemetery, located in Dallas, Texas, was the burial site for the city's African American population between 1869 and 1907 (Davidson 2007). In the face of road construction, archaeological excavations recovered 1157 individuals. Evidence of postmortem examination was observed in two individuals recovered from a single grave (Burial 558) dating to the Late Period (1900–1907) of the cemetery's use. This period coincides with the establishment of the first medical schools in Dallas (1900) and the passage of state legislation (1907) that made it legal to use the bodies of indigents and others as anatomical specimens.

Burial 558 contained the remains of two Middle Adult males (Fig. 5). The first individual was in an extended supine position and exhibits a craniotomy, bisection of the femora at midshaft, and is missing the lower leg and feet elements. The second individual was in a prone position in the foot of the coffin, with his lower legs tightly flexed over the back of the thighs. This individual was missing the skull, the superior six cervical vertebrae, as well as the forearm bones and hands (Fig. 6). The archaeological and osteological evidence suggests that these individuals were dissected for anatomical study (Davidson 2007).

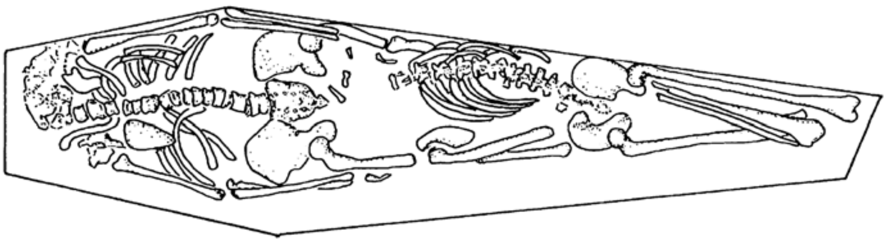

Fig. 5 Burial 558 from Freedman's Cemetery in Dallas, Texas (Fig. 4 from Davidson 2007) (Figs. 5 and 6 reprinted from Davidson JM. 2007. "Resurrection Men" in Dallas: The Illegal Use of Black Bodies as Medical Cadavers (1900–1907). International Journal of Historical Archaeology 11:193–220, Figs. 4 and 5. © Springer Science + Business Media, with kind permission from Springer Science + Business Media)

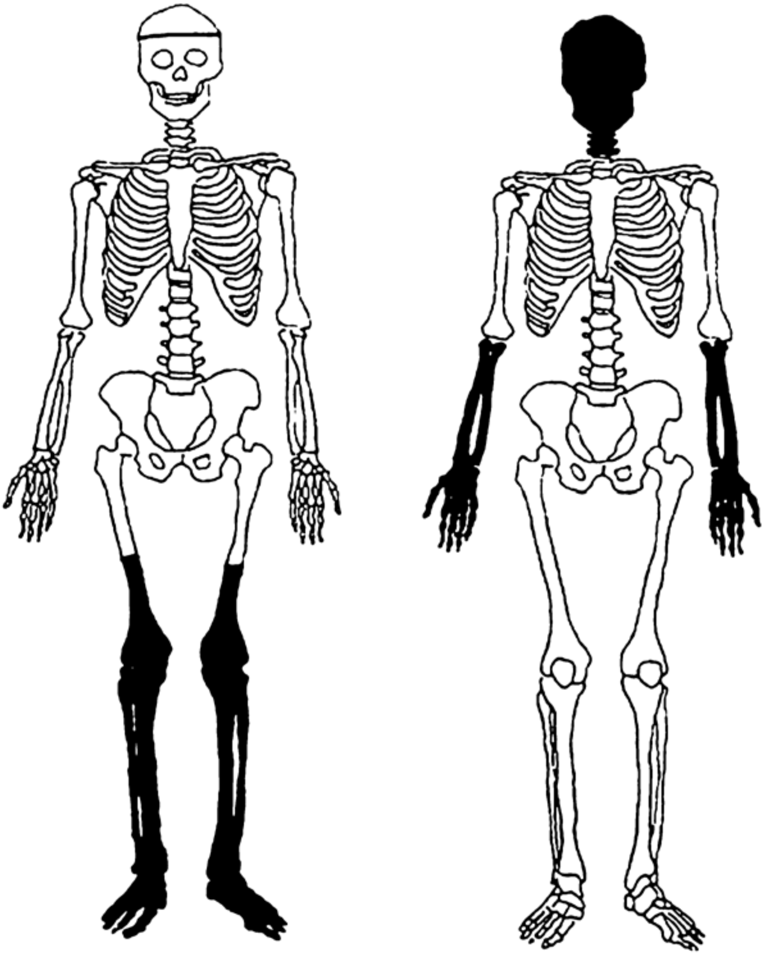

Fig. 6 Representation of the skeletal elements recovered from the two individuals interred in Burial 558 (Fig. 5 from Davidson 2007) (Figs. 5 and 6 reprinted from Davidson JM. 2007. “Resurrection Men” in Dallas: The Illegal Use of Black Bodies as Medical Cadavers (1900–1907). International Journal of Historical Archaeology 11:193–220, Figs. 4 and 5. © Springer Science + Business Media, with kind permission from Springer Science + Business Media)

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Chapter 5
Partible Persons or Persons Apart: Postmortem Interventions at the Spring Street Presbyterian Church, Manhattan

Shannon A. Novak

In the early nineteenth century, New York City was transforming from a second-class port town surrounded by rural farms to the frenetic hub of a global market economy. Not only were the landscape and physical environment undergoing rapid change, but so was the social ecology—the way people worked, raised families, formed communities, and engaged with society and its wider institutions (Sellers 1991). This was modernity in the making, and its forces would have a dramatic impact on the perception of self and others, of individuals and collectives, and on bodily form and function.

Here I consider the impact of these forces through a humble but unique lens: three anatomized crania recovered from the historic Spring Street Presbyterian Church burial vaults (ca. 1820–1850) in lower Manhattan. According to the surviving historical records, this church was attended by a remarkably diverse group of middle-class reformers, working-class families, and the poor. Noted for its fiery pastors and radical abolitionist stance, Spring Street Church attracted public attention because it admitted free persons of African descent even before New York abolished slavery in 1827 (Burrows and Wallace 1999). The church also established a multiracial Sunday school and was reputed to have blessed "mixed-race" marriages (Reitano 2010). Though members of the congregation adamantly denied such rumors, the church would be attacked by a mob during the 1834 Anti-abolitionist Riots (Headley 1873).

This case reveals the messiness of modernization at the local level, where social identities are far more fluid and contested than historical narratives often imply.

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The rapid influx of new people, ideas, and practices into New York City allowed for the coexistence of multiple ontologies (Harris and Robb 2012), though not always seamlessly. Similarity and difference would have been very much on the minds of those attempting to negotiate daily life amid such uncertainty and so many strangers. At times such as these, David Harvey (2000) argues, “a contemporary loss of confidence in previously established categories has provoked a return to the body as the irreducible basis for understanding” (see also Appaduri 1998). In this light, it is not surprising that in the early decades of the nineteenth century there would be an intense focus on the physical qualities of people’s bodies.

One manifestation of this trend was the growing importance of “postmortem interventions,” as Zoë Crossland (2009a) calls them—autopsies, dissections, and the many forms of grave-robbing or “bodysnatching” (see also Cherryson et al. 2012). The nature of the intervention tended to vary with differences in social status and burial practices. Those bodies that were afforded autopsies are generally found in churchyards and crypts, while those that were dissected tend to be located in pauper’s fields or the grounds of institutions. In the United States, race as well as class would play an important role in determining what kind of intervention would take place and where the anatomized remains ended up. The bodies of elites and bourgeoisie were considered appropriate *subjects* for autopsy, while the bodies of the poor and disenfranchised were *objects* for dissection. Rarely do these two kinds of bodies share burial space.

Yet at Spring Street, these two kinds of bodies seem to be found together in the church vaults. The heads of an adult male, an adolescent, and an infant were opened for postmortem inspection prior to their interment in the church vaults. While the physical act was the same for all three—sawing through the calvarium circumferentially to expose the brain—physical evidence suggests that the postmortem performance may have differed significantly for one of these individuals (Novak and Willoughby 2010). An autopsy was likely performed on the adult and the infant. This procedure would have interrupted the funerary process only briefly, and perhaps served to elaborate the biography of each subject (Sappol 2002). The adolescent’s craniotomy was probably the result of dissection, which would have prevented funerary ritual and objectified the body, leaving little of it intact.

Both Sappol (2002) and Crossland (2009a) illustrate how the social position of the living person determined what type of postmortem intervention was deemed appropriate at death. These interventions, in turn, reproduced different kinds of dead bodies, some of which became socially, corporeally, and spatially estranged. These and other clinical acts attempted to corral the diversity into a number of more manageable (more modern) dichotomous categories: rich/poor, white/black, male/female, adult/child, and living/dead. These categories are of course familiar to those of us contributing to this volume, given that our training emerged from a clinical tradition. Much of our own time is spent in the lab dividing up bodies and their parts along these lines, a fact that is not lost on the critics of physical anthropology (e.g., Segal and Yanagisako 2005).

A more reflexive stance of this practice has raised concerns about how categories that emerged with western modernity falsely impinge on our ability to understand the diversity of people in the past (e.g., Sofaer 2006, Geller 2009). Social bioarchaeologists have challenged us to use continuums rather than categories and to consider how different kinds of bodies emerge relationally across the life course and beyond (Agarwal 2012, Geller 2012). These important insights are influencing new approaches that draw on social theory, including concepts such as embodiment, personhood, materiality, and partibility (Boutin 2011, Nystrom 2011, Geller 2012, Duncan and Schwarz 2014, Novak 2014).

Recent theoretical contributions by Crossland (2009a, b), Tarlow (2011), Harris and Robb (2012), and Robb and Harris (2013) have been particularly important in this regard. All bodies, they emphasize, are relationally situated and materially bound. No single ontology, therefore, would ever suffice (Crossland 2009a, Harris and Robb 2012). Indeed, "the idea that a single logic and mode of 'belief' must apply to all situations," Robb (2013a:84) adds, "may be a peculiarly Modernist logic." This relational approach does not collapse variation back into universals, but rather allows for alternative and shifting views of the body to be positioned alongside one another. Because these views are dynamic, changing with contexts and at different scales, consistency and agreement may occur at one level, while discrepancy and contradictions appear at another—even within the same individual. Neither homogenous type nor dichotomous form can begin to account for the vitality of bodies and the mosaic of relations articulated through them.

In what follows, I explore the relational qualities of bodies in early decades of the nineteenth century in New York City when market forces and modernization radically destabilized social and material relations. A "return to the body" as a way of understanding and managing such flux occurred at a number of levels—from techniques of the state to those in the clinic (Foucault 1977, 1978). It is the local level, however, in which I am most interested, places where abstract power relations intersect with lived experience and where different kinds of bodies can emerge. It is among these unruly multitudes (from the perspective of the state) that understandings of the body are negotiated and put into practice. Chris Fowler's (2010:384) approach to personhood is valuable in this regard; he emphasizes "that there are different ways that objectification and personification occur, and different ways that people actively and consciously mobilize the materials of the world, including their own bodies, in making themselves and making other people."

To attend to such makings, I focus on a single street corner in lower Manhattan where people gathered to challenge the onslaught of modernization and to propose an alternative path. At the Spring Street Presbyterian Church, the making of self, community, and other required mobilizing different kinds of people and their bodies. By closely following the life and death courses of the anatomized remains from the church vaults, we might better comprehend the entangled networks of relations that extended from and intersected with the bodies of these three people. Whether partible persons or persons apart, their divergent paths would eventually assemble with other members of a radical abolitionist congregation.

Cityscapes

In 1800, New York City held some 60,000 people; by mid-century this number would multiply tenfold to 600,000, about half of whom were foreign born (Gorn 1987:393). These demographic shifts were fueled by the so-called Market Revolution, the rapid consolidation of an international, profit-driven economy that relied on cheap and unskilled labor (Sellers 1991). As manufacturing and port activities grew, a flood of immigrants and rural migrants moved to the city in search of work, resulting in an increasingly diverse populace.

Emerging from this new economy was an "embryonic middle class" that included "shopkeepers, small master craftsmen, clerks, salesmen, bookkeepers, and bank tellers—who embraced evangelicalism as a way to dissociate themselves from both the dissolute poor and the idle rich" (Burrows and Wallace 1999: 530). These middling families were often clustered in neighborhoods on the periphery of the city, including the Eighth Ward where the Spring Street Church was located (Fig. 5.1). The cornerstone of the church was laid in 1810 in what was then bucolic countryside. A year later, the shingled wood frame building had opened its doors for worship. Census records indicate that the neighborhoods from which the church drew consisted of Euro-American and African-American nuclear and extended families,

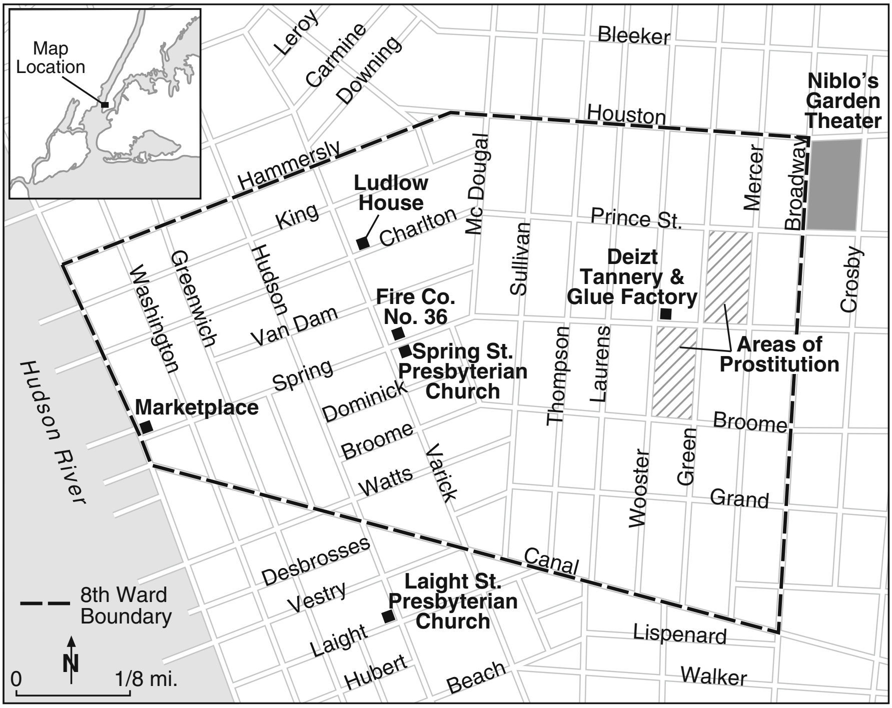

Fig. 5.1 The Eighth Ward of New York City, 1811–1846 (map courtesy of Joseph Stoll; reprinted with permission from Ellis 2010)

including some with live-in domestic servants (Meade 2010). Also in the area were boarding houses and brothels, cottage industries, and docks.

While the congregation would be led by a series of pastors, it was the Rev. Dr. Samuel Cox who drew most of the public attention. Taking the leadership of the church in 1820, Cox was an ardent abolitionist who preached publicly for emancipation. He also practiced what he preached, admitting "Phebe, a free woman of colour" to full communion (*SM* 1811–1835), and establishing a multiracial Sunday school (Moment 1877). In 1825, Cox left the church and the Rev. Henry G. Ludlow was installed as the next permanent pastor. Upon assuming this post, Ludlow described the congregation as some 330 souls "who belonged to the class of person who cannot afford to purchase or hire a pew in our city churches" (*FFP* 1828).

The church thrived under Ludlow, who used the pulpit to call for immediate emancipation. This stance would ultimately result in an assault on his home and destruction of the church by a mob in the summer of 1834 during the New York Anti-abolitionist Riots (Reitano 2010). Ludlow was purportedly targeted because he had recently blessed an interracial marriage, a charge he adamantly denied. *The Courier and Enquirer*, a broadsheet city newspaper known for its support of slavery, commented shortly after the attacks (July 14, 1834): "On the whole, we trust the immediate abolitionist and amalgamators will see in the proceedings of the last few days, sufficient proof that the people of New York, have determined to prevent the propagation amongst them of their wicked and absurd doctrines, much less to permit the practice of them." "Amalgamator" was a common slur used against abolitionists who were threatening to blur social and racial divides (Lemire 2002).

In spite of the church's reputation for radical abolitionist views, what brought its members together may have had little to do with slavery per se. Instead, the unifying force seems to have been a general commitment to democratic, egalitarian principles. For example, Rev. Cox took the position, controversial at the time, that "*all* should be taught *to read*," and even advocated an act of Congress to punish "the neglect of this imperious duty" (*ASSTM* 1824:31). Such egalitarian sentiments were at the core of the religious fervor that gripped the U.S. between 1780 and 1830, a fervor that "did more to Christianize American society than anything before or since" (Hatch 1989:3, see also Rodseth and Olsen 2000). Regardless of institutional structure, the competing sects had a common goal, "to make Christianity a liberating force; people were given the right to think and act for themselves rather than depending upon the mediations of an educated elite" (Hatch 1989:11). By thus democratizing Christianity, the "great awakenings" of this era also brought American religious life into line with egalitarian ideals reaching back to Locke and Rousseau.

Extensions and Articulations

As early as 1823, the Spring Street Church was holding multiracial Sunday school classes in a new extension on the building's east side. Directly below the classroom was a different kind of gathering place—a burial vault, whose chambers were filled with a diverse array of men, women, and children associated with the institution.

While wealthy churches in the city could afford large plots of land for cemeteries, those of more meager means, such as Spring Street, had to resort to burial vaults or send their parishioner's bodies to potter's fields. Given that the church always struggled with debt (Meade 2010:9), subterranean vaults seemed the best they could offer. In fact, when the original chambers filled up, two more were commissioned in 1831 "at the lowest terms offered" (*TR* 1826–1841). The importance of this space cannot be underestimated. "For working men and women," Sappol emphasizes, "burial in a cemetery or churchyard symbolized inclusion in the social order" (2002:35). Moreover, for the poor and socially marginalized of the group, interment in the vaults could mean the difference between remaining physically intact or being dissected at a medical college.

In 2006, the vaults and bodies were (re)discovered while excavating the foundation for a luxury condominium-hotel complex. While details of the recovery can be found elsewhere (Morin 2010, Mooney 2010), it is important to note that the most northern two (Vaults III and IV) were the earliest chambers located under the lecture hall (Hutchings 1894:9), while the southern two (Vaults I and II) were the 1831 additions. Forty coffin plates were recovered during excavation and legible inscriptions indicate that interments occurred over a short 30-year period (ca. 1820–1850). The earlier chambers do not appear to be temporally discrete, however, as coffin plates dating after 1831 are also found within them.

While some individuals were identified in the field and others were sorted in the lab, most of the skeletal remains were commingled. This was primarily a result of coffin deterioration, exacerbated by the process of disinterment and excavation (Mooney 2010). Laboratory analysis identified a minimum number of individuals (MNI) of 193 from the left femur, though this count vastly underrepresents the number of persons thought to have been interred in the vaults. A third of the remains were determined to be from subadults and most are young children and infants (Table 5.1). The remains are unevenly distributed in the vaults, with the majority recovered from the earlier chambers: Vault III (N=31) and Vault IV (N=134). Far fewer remains and artifacts were found in the later chambers: Vault I (N=18) and Vault II (N=14). This is likely due to increased burial regulation after 1831. Burials in the area were banned by 1832, though death dates on coffin plates as well as vital records indicate that interments continued for at least another decade, probably illegally (Meade 2010:11). Mortuary artifacts and personal items were, in general, quite limited (for details, see White and Mooney 2010). The most obvious indicators

Table 5.1 Demographic distribution by left femur

Sex	Fetal	B-1.5	1.5–4.5	4.5–9.5	9.5–14.5	Ind. subadult	YA 15–34	MA 35–49	OA 50+	Ind. adult	Total
Male							26	23	17		66
Female							26	13	15	2	56
Ind. subadult	5	32	15	7	4	7					70
Ind. adult							2			3	5
Total	5	32	15	7	4	7	54	36	32	5	197

of status or class are the coffin plates, which would have marked only a fraction of those interred. These too, however, became disassociated from the bodies, resulting in only two persons being identified by name.

In what follows, I take a biographical approach to the anatomized remains of three individuals recovered from the Spring Street burial vaults. By narrating the life and death histories of each, I draw on both Fowler's (2010) approach to personhood, and Tim Ingold's (2011) concept of a "storied world." In the late eighteenth and early nineteenth centuries, self-narration—the stories of events and happenings unfolding in *this* life—became an important aspect of one's identity, spurred in part by the spread of literacy and the mass production of novels (Campbell 1987; Taylor 1989:288–289). Moreover, the deathbed was where the story of self reached a climax: "This narrating of death, full of biographical, medical, and moral detail, was a procedure that asserted the bourgeois Christian personhood of both the deceased and the narrator" (Sappol 2002:33).

Some of these narrations left traces—historical records, mortuary artifacts, and the bodies themselves. The latter, which initiated this study, include three cases of postmortem intervention that left craniotomy scars. While these traces are intriguing, on their own they remain rather static "documents." Coffin plates with engraved names and dates are a source I turn to in this study to help flesh out these cases. Though these plates may or may not be "a match" to the crania studied here, they allow us to explore wider social and material relations within families, the congregation, the city, and beyond. Through such extensions and articulations we might better understand the dynamic world within which these persons lived, and how it would alter their bodies in death.

Adult Autopsy

The first case, an autopsied adult male, is especially interesting for what it suggests about the dynamics of race and social class in the congregation. The church's ideology, as noted above, was radically egalitarian, and yet this ideal was not always borne out in practice. Before the 1830s, the seating arrangements in the pews may have been unregulated, but in 1831 the Trustees voted to provide separate gallery seats for African-Americans (Meade 2010:12). Segregated seating would also have partitioned people by class, inasmuch as African-Americans made up a large proportion of the working class and poor in the city.

The burial vaults, by contrast, seem not to be segregated, with remains of rich and poor, "white" and "black," all interred in the same space. While race categories based on social constructs would harden throughout the nineteenth century (Lemire 2002), it is unclear how morphological or biomolecular indicators of African ancestry in the Spring Street remains would have been perceived during life. Craniofacial characteristics, dental traits, hair morphology, as well as mitochondrial DNA promise to broaden, but also complicate, our understanding of the diversity of those who were interred in the church vaults.

Fig. 5.2 Superior view of calvarium of Individual HHHH, frontal bone at the bottom (image courtesy of Anthony Faulkner)

One especially complicated figure is the autopsied adult male[1], whose matrilineal ancestry, based on preliminary mtDNA analysis, appears to be non-European (Stephanie Gladyck, personal communication). This individual is represented by 16 cranial fragments that were sorted from screened fill in Vault IV. The fragments were associated through articulation, morphological traits, and taphonomic alterations[2]. The remains are estimated to be those of a middle adult, 45–54 years in age. This cranium could not be articulated with other elements recovered from the same area of the vault—the southwest corner, where at least 13 other adult males were found. It is important to note that none of these postcranial elements display cut marks or alterations indicative of dissection or wider exploration of the body (see, for example, Nystrom 2014).

This individual is a very robust male with thick, dense bones and pronounced muscle attachments[3]. There is no evidence of pathology or anomaly, only an incision from a craniotomy (Fig. 5.2). The cut was made high on the cranium, 57 mm

[1] Lab designation of this cranium is “Vault IV—Individual HHHH.”

[2] Present and in articulation were portions of the left frontal and parietal; four additional frontal fragments were reconstructed, and fragments of the left parietal, occipital, and both temporals were also identified.

[3] Age at death is based on cranial suture closure and other morphological characteristics (Buikstra and Ubelaker 1994). On the ectocranium, the intersecting sutures at bregma are obliterated, though only partial bridging occurs along the remainder of the coronal suture. The endocranial surface is fused and obliterated, and the meningeal grooves are cut deeply on this surface. Yet there are no pacchionian bodies and the bone remains dense and more youthful in appearance.

superior to the supraorbital border, altering only the frontal and parietal bones. The incision is horizontal across the frontal, though slightly beveled along the parietals, indicating that the saw blade was positioned at a superior angle. No false-start kerfs or skipping occurs, although there is a bit of crushing on the endocranial surface above the left orbit where the saw changed position or initially entered the vault. Microflakes have been removed along the endocranial surface of the cuts, but for the most part the eburnated surface is even and consistent on all surfaces. The quality of the surgery performed on this individual suggests that some skill and care were involved.

Such an act would have served to elaborate on this person's biography by adding facts to *his* story—facts that were perceived to be hidden inside (Sappol 2002:103). At the same time, the physician as well likely benefited from this interaction. Not only did he acquire new knowledge and hone his technical acumen, but he also expanded his own biography by suturing it to another through an intimate and private act. The examination would have taken place in a home or office with only a select number in attendance (Crossland 2009a:110). All were witness there to an ontological shift, a transition to a different kind of being—namely, a dead one (Robb 2013b:446).

In the nineteenth century, dead bodies were "implicitly gendered as female," as Simon Harrison (2010:395) argues, "because the female body and the dead body were understood to share a passivity and vulnerability to dishonor and a need for protection by their kinsmen" (see also Sappol 2002:212–237). Consent from the family to perform an autopsy was therefore imperative, especially when the body was to be opened for examination. Surgical penetrations, however, were often quite limited, targeting only a specific organ believed to be diseased or responsible for death (Crossland 2009a).

In the case of the autopsy at Spring Street, what the surgeon might have discovered is unclear, since there is no pathology evident in the bone. Without soft tissue, postcranial elements, or other material associations, we are left with a very thin life history. Given his ancestry, however, this middle-aged man *may* have been considered "other"—even (or especially) by the members of an abolitionist church. Yet the treatment of his corpse is both ambiguous and intriguing. The fact that he was interred right alongside "white" members of the congregation would seem to confirm the church's egalitarian ideology. At the same time, the fact that his body was *autopsied* could be interpreted as a sign of low status (if autopsy is seen as an objectification of the body, like dissection) or of middling to high status (if autopsy is seen as a special intervention by a circle of caring others).

In any case, racial identity was just one dimension of social inequality, and maybe not the most important one. Among the many "whites" interred at Spring Street, there were major inequalities, based on wealth, occupation, and other markers of social or cultural difference. Only a fraction of the dead, for example, were commemorated with coffin plates. Two of these plates suggest the variation in social status that characterized the Spring Street congregation, regardless of racial classification.

Near the remains of the autopsied man were those of Lewis Evans[4], who died at 46 years of age from "convulsions" (*NYCDR* 1822). There was also Nicholas Ware, who died two years later at the age of 48 from "dropsy of the chest" (*NYCDR* 1824). Both men had been born in 1776 and were evidently of "that class of person" who could afford the luxury of a coffin plate. Yet their divergent life histories suggest the range of people who belonged to this class, and the potentially porous nature of class boundaries.

Lewis Evans was a cartman who lived one block south of the church on Dominick Street (White and Mooney 2010:50). His trade is difficult to categorize by class, as noted by Graham Russell Hodges (2012), because while these men were unskilled laborers, they were critical to the movement of commodities in a mercantile economy. The knowledge of their economic worth combined with a distinct collective identity made them a powerful political force that elevated them above what would be implied by skill or means alone (Hodges 2012:3). These collectives, moreover, were notoriously cliquish and vehemently exclusionary. They lived in close proximity as neighbors where life revolved around tavern and family, and the trade (along with its permits) passed from father to sons. The Eighth Ward, where the Spring Street Presbyterian Church is located, became known as a cartmen's ward (Hodges 2012:130, 161); thus Lewis Evans would have been in familiar company. Rather unexpected, however, is his association with a radical abolitionist congregation. Assuming he attended the church, Evans would have gathered with immigrants, freed slaves, and the poor—all potential competitors for the work of the cartmen, who tried to exclude them from the trade and its fraternity.

While Evans's association with the church seems unusual, Nicholas Ware's is extraordinary. In brief, he was born in Virginia, moved to South Carolina for a short time as a child, and then settled in Augusta, Georgia. Here he studied medicine, and then moved on to law school in Litchfield, Connecticut. After holding a number of state-level positions, he became the U.S. Senator from Georgia in 1821, a position he held until his death in 1824 (DeGidio 2003:89–90). In early August, the Senator traveled to New York City where he became ill and died on September 7. A Connecticut newspaper, *The American Sentinel*, reported that his death followed "a protracted illness for relief from which he had recently visited the springs" (September 22, 1824:3). The $10 fee for Ware's interment in the Spring Street burial vaults was paid for by Daniel H. Wickham, *esq.* (*TM* Sept. 24, 1824), though his connection to the Senator remains unclear. Ware, in any case, seems to have married into a reform movement that was temporarily affiliated with the Spring Street Church. His wife's family in Georgia was involved in the American Colonization Society (Gifford 1975:10–11), a group that supported the relocation of freed slaves to Liberia. The Society received early support from many northern abolitionists, including the Reverends Cox and Ludlow.

These brief histories of Evans and Ware illustrate the dynamic processes that brought their bodies to the same place of burial. At the same time, geographical origin, profession, and daily life were extremely different for these two men and it

[4] The surname was misspelled on the coffin plate as "Evens."

is unlikely they would have associated or been considered of the same status or class. Yet in death, the bodies of both were marked with coffin plates, setting them apart from most of the others interred at Spring Street. These plates, moreover, are what allow us to activate their stories and set them in motion again.

The autopsied man also draws our attention, but his body is marked in a quite different way. Saw marks and genetic signatures, rather than coffin plates and proper names, draw us into a certain kind of narrative—one that focuses on his body rather than the relationships in which he was embedded. In particular, we are drawn to the fact of his non-European ancestry rather than his class or other social position. Putting together these three middle-aged men reminds us of the full range of social inequality that was present in the congregation, yet is obscured—or even transformed—when their dead bodies were placed in the vaults below.

Infant Autopsy

Also recovered from the fill of Vault IV were the remains of an infant, about one year of age at death. This case offers an unusual perspective on childhood as an emerging cultural category in the early nineteenth century (Finkelstein 1985, Mintz 2004). Because a person's physical and moral states were thought to be amalgamated, one's "constitution" was considered both heritable and environmental in origin. The constitution of children, as extensions and elaborations of their parents, was linked to that of their ancestors, but even more directly to their household environment. In place of the sinful and aggressive infants born to Puritan parents, newborns of the early nineteenth century were increasingly perceived as malleable beings in need of nurturance and education (Mintz 2004). Social reformers set out to sculpt the next generation of healthy and moral citizens not only in the home, but also in the nursery itself. "To reach children as soon as they could walk, educators thought, was to break through the generational transmission of poor character and rescue infants from newly alarming and vicious environment of early American cities" (Kaestle 1983:48).

The leaders of the Spring Street Church were enthusiastic supporters of such outreach. When the church established its Sunday school in 1823, the classroom was open to infants as young as 18 months. At the inauguration of the school, Rev. Cox addressed a crowd of "probably 3000 persons," including "nearly 800 children" (*ASSTM* 1824:30). He implored mothers to enroll their offspring, and called for vigor on behalf of parents and teachers to transmit moral and patriotic values to the nation's youth. Cox emphasized the need to begin this process while children were very young, "at the *happiest* period of human life, and when the mind is most susceptible of impression" (*ASSTM* 1824:31–32). To illustrate the benefits of the "Sabbath school system," he used a familiar pedagogical metaphor, the image of a growing tree:

> The system … begins with the tree when it is but a *twig*; takes it in *its pliancy*; prunes it; erects its stem *towards the skies*, and teaches it to expand its foliage *to the sun*; to drink the dews of *heaven*; to shed its fragrance through the air, and bring forth its *fruit* to maturity and perfection; but to bend a *full grown oak*, how vain is the attempt!

Cox had extensive personal experience with the care and cultivation of young "oaks." Over his lifetime, he fathered at least 15 offspring, six of whom died in infancy or childhood (Meade and White 2013). Indeed, the same year the Sunday school was inaugurated, he lost an eight-month-old daughter, Elizabeth, to "infantile flux" (*NYCDR* 1823).

Even as children were schooled at the church, those who succumbed to childhood diseases or other maladies of the day were interred in vaults directly below the classroom (Hutchings 1894:9). Cox himself buried at least three of his children, victims of the same outbreak of scarlet fever, in Vault IV. His experience seems to have been representative of a general pattern in the congregation: of the 134 individuals documented in Vault IV, 62 are children[5]. Of these 62, nearly half had died in infancy.

Such a high incidence of infant mortality was hardly unusual for the city as a whole. Based on the records of the New York City Inspector, deaths of children under one year of age ranged from 20 to 25 % of all deaths, right up until mid-century, when the rate actually increased (Duffy 1968:579). Miasmas, or foul airs, that lingered near sewers, cemeteries, and overcrowded housing were seen as instrumental in these deaths. As a result, early sanitary reform tended to focus on areas where immigrants and the poor were concentrated. At the same time, and somewhat paradoxically, it was widely believed that the highest rates of infant and child mortality occurred among the *wealthy*. Physicians and Romantic health reformers alike argued that "increasing wealth and luxury were undermining the national robustness that had traditionally followed from a simple and vigorous way of life" (Meckel 1990:20). Thus, as a result of pampering, children of affluent families were seen as more susceptible to environmental hazards.

When well-to-do parents did lose a child, they were materially equipped, and perhaps especially inclined, to take elaborate steps to determine the cause of death. In the early nineteenth century, autopsy was still a highly unusual procedure. As a service offered by a private physician, it was hardly available to poor or working-class families. By this time, however, "members of the aristocracy and gentry sought out private autopsy almost as a matter of privilege—their bodies were important enough to warrant some medical explanation of the death" (Sappol 2002:103). In itself, of course, this does not guarantee that an autopsied child must have come from a wealthy or aristocratic family. Yet a case of this kind is likely to have involved some degree of privilege—whatever social or material advantage would have allowed for a rare and specialized procedure.

Among the many children documented in the Spring Street vaults, only one displays evidence of an autopsy. This infant is represented by four well-preserved cranial fragments[6] that were sorted from screened fill and associated through articulation, morphology, age, and taphonomic changes. The child is estimated to

[5] The social category of "child" is based on the criteria used by the church to assess burial fees (see Ellis 2014a).

[6] Lab designation of this cranium is "Vault IV—Individual A." Two frontal fragments, a left parietal and occipital, were identified. For more detail on the assessment of demographics characteristics and the methods used, see Novak and Willoughby (2010).

Fig. 5.3 Occipital of Individual A, illustrating overlapping saw marks (image courtesy of Anthony Faulkner; reprinted with permission from Novak and Willoughby 2010)

be nearly a year in age, based on seriation with other subadult crania in the series, and the lack of fusion between squamous and lateral portions of the occipital. Sex and ancestry are indeterminate, and there is no evidence of pathology in the cranial bones (Novak and Willoughby 2010).

All four of the cranial fragments display clear evidence of perimortem saw marks. On the occipital, intersecting cuts and false-start kerfs indicate that a very thin (0.9 mm), fine-toothed saw was used to make the incision (Fig. 5.3). Like the adult, the calvarium was removed well above the orbits and temporal squama. Similarly, the cuts are clean and symmetrical on the ectocranial surface except for a small area near the left coronal suture where chipping and false-start kerfs mark the initial incision or a change in the direction of the saw (Fig. 5.4).

This infant lived a much shorter life than the anatomized male, but one that was nonetheless extended and elaborated just a bit more through a postmortem examination. If the investigation was driven by an illness or disease, the condition is not apparent in the skeletal remains that were recovered. Most of the deadly childhood afflictions—laryngeal diphtheria, small pox, and scarlet fever—strike quickly and leave little time for hard tissue lesions to form. If the autopsied child died suddenly, an internal examination may have helped clarify the circumstances of death. Assuming wealth or social privilege played a role in this process, artifacts from the vaults, especially coffin plates, might provide some insight into which families in the congregation were in a position to request an autopsy.

Fig. 5.4 Left lateral of Individual A, frontal to the left and parietal to the right (image courtesy of Anthony Faulkner; reprinted with permission from Novak and Willoughby 2010)

Of the 21 coffin plates recovered from Vault IV, nine would have marked children's caskets. Most of these markers were smaller than the adult plates (White and Mooney 2010:42–3), matching the more diminutive bodies and the containers that held them. One of the plates was inscribed with two names. In January 1832, the Rev. Cox buried his two sons, Alfred and Edward, and had their names engraved together on the shared coffin. The boys, aged six and three, died within a day of each other, as a result of scarlet fever. Their younger sister, Abiah Caroline, had succumbed to the disease a few days earlier. No coffin plate, however, was identified for the girl, who died at the age of two. Abiah was not alone in this regard. Of the five coffin plates recovered for children younger than two, all were made for boys (Table 5.2). Sons appear to have been privileged, even at this very young age.

The youngest child with a coffin plate is "J W Root," who died at age four months and five days from "inflammation of the lungs" (*NYCDR* 1830). Though this boy is too young to fall within the age range estimated for the autopsied child, his case is worth considering for what it says about the members of the congregation who could afford the distinction of a coffin plate. J. W. Root was the son of James Root, a fur merchant. By the time J. W. died, New York had become the principal American port for shipping pelts to China (Wright 1984:18). The most successful traders were employed by the American Fur Co., founded in 1808 by John Jacob Astor, but many of New York's small merchants and speculators, such as James Root, also prospered from the global network of the fur trade.

Similar commodity booms were likely to have enabled other members of the congregation to join the emerging middle class. Silver in particular had long been

Table 5.2 Coffin plate inscriptions of infants and young children recovered from Vault IV

J W Root Died Nov 26th 1830 Aged 4 Mos 5D	*Oswald Williams Roe* Died 27th November 1822 Aged 10 Months & 5 Days	*James Kauck* Died 24th Sepr 1829 11 Months & 13 D
Charles Morgan Died 16th Jany 1820 1 Yr 1 Month 12 Days	*Miles Ray* Died 19th April 1835 Aged 1 Yr 8 Mos 17 D	*Josephine Dunham* Died 23rd Dec 1830 Aged 2 Ys 10 Mos 22 D
Emma Fitz Randolph Died 16th Aug 1822 Aged 5 Yrs 8 Mo 12 Da	*Alfred Roe Cox* Born Feby 7, 1825 *Edward Dorr Griffin Cox* Born Sept^{r} 18, 1828 Died Jan 1, 2 1832	

Fig. 5.5 Coffin plate of Oswald Williams Roe (image courtesy of AECOM [formerly URS])

"the basis of western commerce to China as surely as tea was the foundation of the return trade" (Wright 1984:25). Throughout the 1820s, New York merchants assembled cargoes of silver from Central and South America, and then shipped them to Canton and other Chinese ports, where the metal was used in daily commerce as well as the crafting of precious objects.

One of the coffin plates from Vault IV is made of pure silver (Fig. 5.5). The inscription names an infant, Oswald Williams Roe, who died in 1822 at the age of

10 months and five days from "inflammation of the bowels" (*NYCDR*). He was the son of a Manhattan merchant, Peter Roe[7], whose brothers were silversmiths in the Hudson River Valley (White and Mooney 2010:47). The plate that marked Oswald's casket was of the highest quality, in sharp contrast to other markers in the vault that were simply plated to give them the appearance of silver (White and Mooney 2010:41). The high status of Peter Roe's family is further suggested by his close association with Rev. Cox, Daniel H. Wickham, and other prominent members of the Spring Street congregation. Roe, Cox, and Wickham were all actively involved in the United Foreign Missionary Society (*RFP*; *WFP*). It is perhaps significant that Cox's son Alfred was given the middle name "Roe." Wickham, it will be recalled, was the person who paid the fees for Senator Ware's interment in the church vaults. All of this suggests that the Roe family was in a position not only to provide a coffin plate but also to have an autopsy performed, if necessary, on their infant son.

To account for such an autopsy, however, the relative affluence of the family is not the only consideration. If the infant's father or other close relation was a physician, this might have made the procedure more feasible and perhaps advantageous from a medical or scientific point of view. Anatomical knowledge was enhanced by surgical investigation of the body, and the physician's reputation often depended on his interpretation of a given death—even, or especially, when the death came within his own family. An instructive case of postmortem intervention by a family member comes from the crypts at Christ Church, Spitalfields, a neighborhood of East London (Molleson and Cox 1993). Of the 938 bodies interred there between 1729 and 1852, seven were found to have signs of autopsy. Two of these were children, including a 10-month-old infant. In this case, though no pathology was evident, a craniotomy had been performed. Significantly, the child was "the son of a surgeon" (Molleson and Cox 1993:89).

For a medical doctor, especially a surgeon, an autopsy clearly carries a different significance than it usually would for a member of the general public. In the case of Spring Street, there was a physician in the congregation, Dr. John E. Ray, whose infant son Miles died in the spring of 1835, probably from "dysentery" (*NYCDR*). Was Miles the autopsied infant found in Vault IV? His age of death, according to his coffin plate, was "1 Yr 8 Mos 17 D." This is somewhat older than the skeletal estimate for the autopsied infant, but the possibility remains that the boy's growth was slowed or stunted by illness, making it difficult to determine his actual age. In any case, the potential role of the medical profession in postmortem interventions is evident here, as well as in the case that follows.

[7] In 1822, Peter Roe is listed as residing in lower Manhattan (White and Mooney 2010). He and his family may well had fled north during the yellow fever epidemic that summer. They were perhaps residing only temporarily in the Spring Street neighborhood at the time of Oswald's death in November.

Adolescent Dissection

The final case is a probable male who died in early adolescence, and whose disarticulated cranium was recovered from Vault II[8]. This body was subjected to a very different kind of postmortem intervention from what we have considered so far. Instead of a brief, private autopsy performed in a familiar setting, a dissection was carried out, perhaps over many days, very likely by strangers rather than acquaintances of the deceased. The body, moreover, would have been examined in its entirety, inside and out. In the end, it was altered beyond recognition, no longer suggesting any specific, personal identity.

The importance of dissection was enhanced by the professionalization of medicine, which involved a sharp differentiation of doctors from bone setters, midwives, faith healers, and other folk specialists. Whatever mystique surrounded a nineteenth-century physician was likely based on his surgical acumen and anatomical expertise. "A practitioner of medicine, without knowledge of anatomy, is a gross absurdity," declared the eminent American physician, John D. Godman (1828:30–31). "One might as well speak of honor without honesty, of virtue without chastity, or good breeding without decency." Interior anatomies, furthermore, could be mastered only through extensive training based on the practice of dissection.

In the early nineteenth century, only a few medical schools had been established in the U.S. These institutions often permitted students to fulfill the dissection portion of their training at one or another of the independent anatomy schools that proliferated in New York City and elsewhere (Shultz 1992:18). Essential to the curriculum was a reliable source of cadavers. In New York, the bodies of executed prisoners could be legally obtained for dissection, but demand for such corpses was always greater than available supply. Grave robbing was principally motivated by the market for medical cadavers. By 1819, body trafficking had become such a problem in New York that the state legislature made it a felony punishable by five years in prison; yet the activity was still too lucrative for many to resist (Sappol 2002:112).

The most obvious targets of grave robbing were potter's fields and other public burial grounds filled with the remains of the marginal and the vulnerable. These were people *without*—those lacking family, resources, or social respectability to protect them. "Foreign" bodies, especially those of sailors and others in transit, were desirable for precisely this reason: "Many seamen died in port, with few or no local connections or resources, and so no one to discover or oppose the robbing of their graves" (Sappol 2002:116). Moreover, the bodies of immigrants, indigents, criminals, and slaves were perceived to be qualitatively different, both before and after death, from those of respectable citizens. Physicians such as John D. Godman argued that "multitudes of dead" were sent forth daily from "prisons, penitentiaries, and lazar houses of our country … who, having seldom or never contributed to the

[8] Lab designation of this cranium is "Vault II—Individual J." For details and elaboration on demographic assessment and methods, as well as skeletal and dental pathology, see Novak and Willoughby (2010).

well-being of society, during life, should all be made tributary to their fellow-creatures after death" (1828:19). Not only were these bodies lacking, but they were also deeply in debt to society.

Other profitable targets of grave robbing were diseased bodies that could be used to study both the pathology itself and the effectiveness (or lack thereof) of medical treatments (Sappol 2002:14; Moore 2005:40). Parts of such bodies were often retained and preserved, labeled by disease or other anomaly, and prepared for display in personal collections. Re-tooled in this way as props, they could be used to legitimate a doctor's practice, attesting to his rite of passage in the dissection theater (Sappol 2002:91–94).

The dissected body in the Spring Street vaults is likely to have been subjected to some such treatment. Before his death at about 14 years of age, he apparently suffered from a chronic disease of unknown etiology. Skeletal evidence of pathology includes bilateral cribra orbitalia, small lytic lesions on the frontal and maxillae, enamel discoloration, and linear enamel hypoplasias in the molars (Novak and Willoughby 2010). After death, the cranium was cut circumferentially with a thin, fine-toothed saw (Fig. 5.6). The poor quality of the surgery, however, suggests an amateurish effort. The incision is asymmetrical, marked by numerous false-start kerfs and chipping, and wastage is extensive, leaving a noticeable gap between the superior and inferior margins of the cut (Fig. 5.7).

Fig. 5.6 Frontal of Individual J, illustrating craniotomy incision and facial morphology (image courtesy of Anthony Faulkner; reprinted with permission from Novak and Willoughby 2010)

Fig. 5.7 Occipital of Individual J, illustrating false-start kerfs and saw marks (image courtesy of Anthony Faulkner; reprinted with permission from Novak and Willoughby 2010)

After dissection, the cranium was further modified, perhaps to produce a teaching specimen. Thin-cut marks are present on the ectocranium and endocranium, consistent with the use of a scalpel to remove residual soft tissue. Most tellingly, metal pins are embedded in the frontal and occipital bones. Though the pins are highly corroded, radiographs reveal their positioning within the diploe of both elements (Fig. 5.8). Thus modified, the cranium could be opened like a lidded bowl, making it appropriate for anatomical instruction or simply for display, whether in a medical setting or a personal collection.

How such a specimen came to be interred in the vaults of the Spring Street Church is a difficult question (Novak and Willoughby 2010). Within Vault II where this cranium was found, there were far fewer individuals in the chamber (MNI = 14)[9], and only a single coffin plate was recovered from within; it belonged to the son of a

[9] This estimate is based on the left femur, though this element clearly underestimates the number of individuals in this vault, which is closer to at least 20–25 persons. Subadults are underrepresented in this count because their femora were either not recovered or too fragmentary to be included in the estimate.

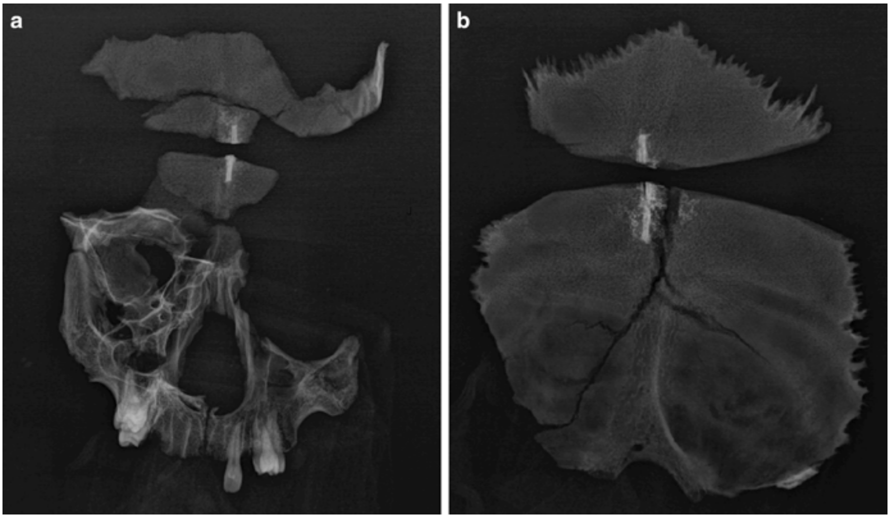

Fig. 5.8 Radiograph image of Individual J, illustrating metal pins embedded in the (**a**) frontal and (**b**) occipital bones (image courtesy of Dr. Ralph Stevens and Valerie Haley, Oneida Medical Imaging; reprinted with permission from Novak and Willoughby 2010)

tailor who died in 1840. In any case, a postmortem intervention of this kind would hardly have been sanctioned by this reform-minded congregation (Sappol 2002). The very notion of a loved one's body being dismembered through dissection provoked horror and outrage in the general public; it was commonly perceived as a desecration of the corpse that would impede resurrection (Richardson 1987, Moore 2005, Halperin 2007).

Along with concerns for body and soul, dissection had implications for the intrusion into private family affairs. Julie Husband (2010:3) has argued that middle-class reformers were drawn, in part, to the abolition movement because "they saw in the slave's exploitation a parallel to their own." Class sentiments were deeply entangled with domestic discourse that expressed anxiety over market-driven changes to their own families through narratives of the dissolution of slave families. The domestic sphere was to be vigorously defended, a sphere that clearly extended to the dead. "The unearthing and dissection of bodies," notes Sappol, "was seen as an assault upon the dead and an affront to family and community honor" (2002:3).

Moreover, the stigma of dissection and its association with immorality and crime was seen to be perpetrated by a privileged bourgeois class on the disadvantaged. Middle-class reformers were, in general, opposed to "skin" trades of prostitution and slavery, and "rejected anatomy acts as ghoulish and undemocratic" (Sappol 2002:4). From the 1830s until the passage of the 1854 "Bone Bill," prohibitionists, moral reformers, and antislavery Whigs would rally against anatomy legislation in New York (Sappol 2002:133). Such legislation allowed bodies of the "unclaimed"—primarily immigrants and the poor—to be given over to medical schools for teaching and dissection.

In fact, the dissected cranium may have been that of an immigrant. Findings from a stable isotope study suggest that the adolescent was not local and was likely a recent arrival to the city (Joan Brenner-Coltrain, pers. comm.). Based on nitrogen values from bone collagen ($\delta^{15}N$ 11.6), and carbon values from collagen ($\delta^{13}C$ −20.7) and apatite ($\delta^{13}C$ −15.8), his diet was determined to be either very low or virtually devoid of both marine foods and C4 grains, such as maize. His protein intake, rather, was provided by terrestrial animals. This pattern differs from the stable isotope values determined for 14 other individuals interred in the vaults. Though his oxygen isotope values from bone apatite ($\delta^{18}O$ −6.8) are too negative to indicate that he came from the British Isles, they can geolocate him to southern Germany or perhaps adjacent areas in France or further east in Europe. By the 1830s, immigrants from Europe were arriving in New York in great numbers, many of them the recruits of American contractors who were importing cheap labor. The boy or his family may have been part of the movement. Unfortunately, however, the oxygen isotope value can also geolocate him along the eastern seaboard of the U.S., though his diet would be unusual for such a place of origin.

What is important, however, is that the remains of this person (or parts thereof) were placed with the bodies of other members of the congregation, thereby recognizing a continuity of identity within a moral society. Such an act would acknowledge that the "specimen" was clearly something other than an object—though its position as a subject was undoubtedly unstable. Given the lack of name, family, or place of origin, this person would have remained a "stranger," in Simmel's sense (1971 [1908]:147)—a person who enters a group's space and *stays* in it, though he continues to be socially remote and distant from it.

Conclusion

The three cases considered here illustrate an array of postmortem interventions and the ways in which various segments of society may be engaged and reflected in such practices. The Spring Street congregation was a meeting place for people of diverse origins and social positions. By necessity, they had shifting and often contradictory views of one another, including each other's bodies. What it meant to be a person, to have a body that "counted," was entangled with new perceptions of race and class, childhood and parenting, citizen and stranger.

At the same time, these church-goers constituted a community, ostensibly united in a profound social and moral sense. The paradox of Spring Street is the way such a community was maintained in the rapidly modernizing landscape of New York City. The very layout of the church, with people gathering in pews above and in vaults below, tends to disguise a proliferation of social and biological differences, including those elaborated through postmortem practices.

This gathering of differences, however, is what allowed new identities to emerge and utopian futures to be imagined. By normalizing the "being together of strangers," the congregation put into practice what Iris Marion Young (1990:237) described as the modern ideal of city life: “In the city persons and groups interact within spaces and institutions they all experience themselves as belonging to, but without those interactions dissolving into unity or commonness.” The Spring Street Church was an early example of such an ideal urban space and institution. Yet it was by no means a place of equity. As illustrated above, only some congregants were able to harness the material and social resources that would set them apart, whether in life or after death. The paradoxical togetherness of “persons apart” depended on shifting ontologies of selves and others, as bodies passed through—and sometimes came to rest—at the busy intersection of Spring Street.

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Part III
Evidence from Medical Institutions

Chapter 6
Teachings of the Dead: The Archaeology of Anatomized Remains from Holden Chapel, Harvard University

Christina J. Hodge, Jane Lyden Rousseau, and Michèle E. Morgan

Introduction: Teachings of the Dead

As its name suggests, Holden Chapel at Harvard University in Cambridge, Massachusetts was intended to be a place of worship when built in 1744 (Fig. 6.1). Instead, by 1801 the university retrofitted the structure for anatomical and chemical instruction and to house the Harvard Medical School (HMS), founded 19 years earlier in 1782. In 1820, William Henry Furness attended a few anatomy lectures at Holden while a Divinity student at Harvard, mirroring the building's spiritual and profane associations in his own interests. Furness was a future abolitionist and minister of the First Unitarian Church of Philadelphia. A moralistic bent is apparent within the pages of his 1820 lecture notebook, where he wrote on April 5: "Although the dead cannot tell us anything of a future life, they can be made to teach us a great deal concerning the present" (Furness 1820). His words connect present and past preoccupations with the social roles of human remains. Archaeological evidence of early nineteenth-century anatomization recovered from a trash feature beneath Holden Chapel materializes Furness's aphorism, providing insight into the creation of medical authority, shifting ethical norms, and concepts of identity, personhood, and the body during a transformative period in medical education.

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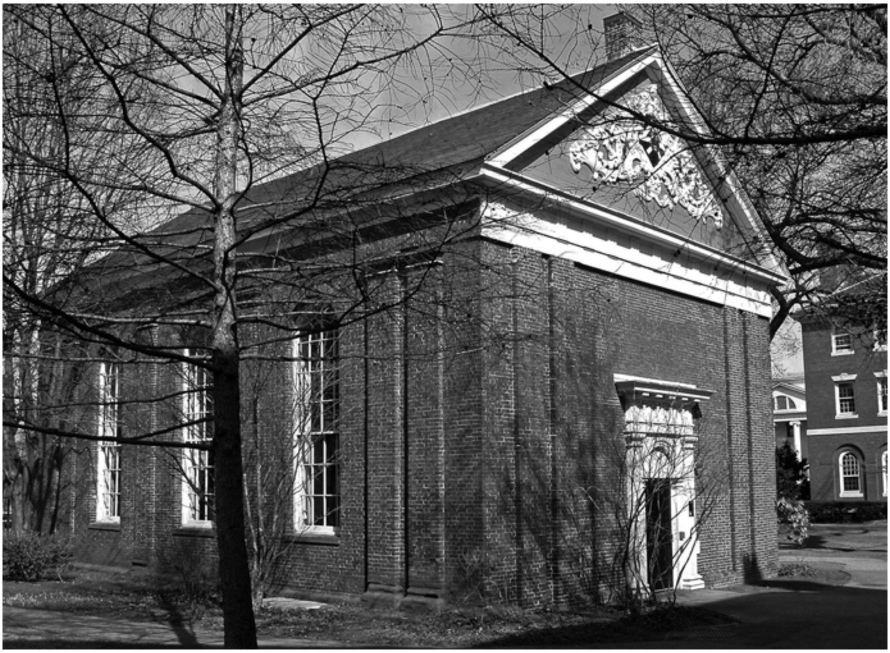

Fig. 6.1 Holden Chapel (2007). Photograph by Daderot, available under a Creative Commons Attribution ShareAlike license

For those investigating historic anatomization and its legacies, the "teachings of the dead" include:

- The medical knowledge imparted by deceased human bodies as they participated in anatomical lectures as cadavers, prepared specimens, segments, prosections, and other body portions.
- The instructional content of nineteenth-century anatomical lectures, which were taught by (now) long dead faculty and absorbed by (now) long dead students.
- The social history of medicine, an endeavor facilitated by persistent traces of past people and instructional moments.

The archaeology of Holden Chapel is centrally concerned with—as Furness put it—the ways in which the dead were "made" to teach the living.

The word "made" also carries multiple relevant meanings. By using deceased bodies as instructional props, instructors made the dead teach the living about the intimate workings of human biology. Faculty and students also fabricated ("made") specimens from pieces of deceased and living bodies, obtained via dissection or surgery. "Made" also carries a sense of predestination. The Boston *Independent Chronicle* suggested in 1783 that it was "entertaining to every ingenious and philosophical mind" and "to be taught the structure of the human body; to be led into the knowledge of the various parts by actual dissection … [was] peculiarly instructive and advantageous to the young student in physic" (1783).

Perhaps Furness and his contemporaries reasoned that dead bodies existed—were "made"—to fulfill this potential.

Whatever meanings Furness intended, his sentiment still holds true. The dead of whom he wrote continue to teach us a great deal about the past. They also teach about our present, which has been so strongly shaped by medical and social values of the nineteenth century.

The Holden Chapel Collection

Excavation

After its construction in 1744, Holden Chapel served a variety of uses: chapel, shed, barracks, lecture space, and meeting room (Batchelder 1921; Gritt 1955). Beginning in 1800, it was repeatedly renovated to host anatomical lectures for Harvard's fledgling Medical School and the undergraduate College. The peak of this use occurred between 1800 and 1830 and was over by 1862, but a hidden legacy persisted far longer. In 1999, the latest renovation re-excavated the Holden basement (Hodge 2013; Sexton 2000). Workers exposed a circular dry well of mortared brick, 1.75 m in diameter and 0.65 m high, dug directly into the sandy subsoil. The well's design allowed effluvia to dissipate while solid detritus was left behind for periodic removal (Hodge 2013:9). Based on depositional strata and their contents, it appears that the final fill of human remains, animal bones, and other artifacts remained in the well from the mid-nineteenth century until disturbed by the 1999 renovation.

Excavators identified 14 fill levels above, in, and under the dry well (5–75 cm below local datum) (Hodge 2013:8–9). They recovered 100 % of the surviving artifacts, which were concentrated in levels 6 through 10 (35–70 cmbd). Finds included 2748 fragments of animal bones, glassware, ceramics, architectural debris, clothing, fasteners, and unidentified materials, as well as 907 human remains fragments and elements from at least 16 individuals (total $N = 3{,}655$) (Tables 6.1 and 6.2). The dry well yielded domestic artifacts (bowl, chamber pot, beer bottle, ink well, buttons, etc.) (Fig. 6.2) yet is dominated by the material culture of nineteenth-century anatomy and chemistry. Laboratory vessels include test tubes, hand-etched graduated cylinders, slides, flasks, and specimen jars, as well as charred and stained crucibles (see Fig. 6.2). Most human remains are fragmentary, presenting a variety of cut marks and, rarely, mounting (vertebrae on iron pins) (see Figs. 6.2, 6.3, and 6.4).

There were no lenses of lime, sand, or ash, to indicate repeated fills and a long-term concern for stench or sanitation as reported for the Medical College of Georgia (Blakely 1997:6). In fact, ceramic shreds from the same vessels were found in multiple levels, pointing to a rapid fill from a single source (Sexton 2000:82–84). Significant amounts of ceramics, glassware, and sectioned bones are largely complete, suggesting a primary deposit. Yet the human remains are from multiple individuals, and no complete (or even partially complete) skeleton is present. Diagnostic artifacts (glassware, ceramics, buttons) provide bracketing dates of ca.

Table 6.1 Artifact totals from Holden Chapel

Category	Total	%
Animal bones[a]	357	12.99
Architectural[a]	131	4.77
Ceramics	163	5.93
Coal/clinker[a]	46	1.67
Coral	1	0.04
Fiber/fabric	2	0.07
Glassware/glass bottles[a]	973	35.41
Nail with bone	27	0.98
Non-architectural metal	28	1.02
Personal items	39	1.42
Pigment[a]	80	2.91
Pipe fragments	1	0.04
Rubber	3	0.11
Scientific/instructional ceramics	73	2.66
Scientific/instructional glassware[a]	470	17.10
Seed	1	0.04
Shell[a]	346	12.59
Soil samples	4	0.15
Stone	3	0.11
Total	2748	100.00

"Architectural" includes brick, mortar, wood, nails, plaster, and window glass. "Personal" includes buttons (ten), a knife, and fragments of leather boots/shoes (two or more)
[a]Artifact totals include some estimated quantities

Table 6.2 Human skeletal remains totals from Holden Chapel

Skeletal elements	Adult			Juvenile	
	Number	Total elements recovered	Total expected elements per individual	Number	Total elements recovered
Cranial		35	23[a]		0
Parietal-left	2		1		
Parietal-right	2		1		
Temporal-left	1		1		
Temporal-right	2		1		
Maxilla-left	2		1		
Maxilla-right	3		1		
Zygomatic-left	2		1		
Zygomatic-right	1		1		
Nasal-left	2		1		
Nasal-right	2		1		

(continued)

Table 6.2 (continued)

Skeletal elements	Adult			Juvenile	
	Number	Total elements recovered	Total expected elements per individual	Number	Total elements recovered
Lacrimal-left	0		1		
Lacrimal-right	0		1		
Palatine-left	0		1		
Palatine-right	0		1		
Inferior nasal concha-left	0		1		
Inferior nasal concha-right	0		1		
Mandible	3		1		
Frontal	4		1		
Occipital	1		1		
Sphenoid	3		1		
Ethmoid	3		1		
Vomer	1		1		
Hyoid	1		1		
Dental		30	32		0
Maxillary					
Incisor	1 (L)		4		
Canine	2 (1L, 1R)		2		
Premolar	3 (L)		4		
Molar	1 (unsided)		6		
Mandibular					
Incisor	5 (1L, 4R)		4		
Canine	4 (2L, 2R)		2		
Premolar	9 (3L, 6R)		4		
Molar	5 (3L, 2R)		6		
Appendicular		137	24		13
Clavicle-left	7		1		
Clavicle-right	5		1	1	
Scapula-left	5		1		
Scapula-right	3		1		
Humerus-left	3		1	1	
Humerus-right	6		1	1	
Radius-left	4		1		
Radius-right	7		1	2	
Ulna-left	6		1		
Ulna-right	8		1		
Ilium-left	7		1		
Ilium-right	3		1		
Ischium-left	6		1		
Ischium-right	4		1		
Pubis-left	4		1		
Pubis-right	3		1		

(continued)

Table 6.2 (continued)

Skeletal elements	Adult			Juvenile	
	Number	Total elements recovered	Total expected elements per individual	Number	Total elements recovered
Femur-left	12		1	2	
Femur-right	6		1	1	
Tibia-left	9		1	2	
Tibia-right	5		1	2	
Fibula-left	8		1		
Fibula-right	7		1	1	
Patella-left	5		1		
Patella-right	4		1		
Axial		219	58		12
Cervical	17		7		
Thoracic	46		12	1	
Lumbar	19		5		
Sacral	18		5		
Coccygeal			4		
Rib-left	59		12	6	
Rib-right	52		12	5	
Sternal	8		1		
Extremities		336	106		0
Carpal	43		14		
Metacarpal	49		10		
Tarsal	54		16		
Metatarsal	40		10		
Phalange	150		56		
Unidentified or unsided elements		112			13
Cranial	6				
Dental	1				
Appendicular	61				
Axial	40			13	
Extremities	4				
Total		869			38

[a]Excludes auditory ossicles

1785–1860. Peak use of these chronological markers occurred in the 1810s through 1830s (Miller, et al. 2000). The fill therefore probably dates between renovations in 1801 and 1850 (Bunting 1985:27). At that point, refuse apparently was aggregated from lecture rooms, cabinets, and corners and put into the expedient dry well. The basement feature was then covered with redeposited sandy subsoil from beneath the floor and forgotten.

Fig. 6.2 Some artifacts recovered from the fill of the basement dry well at Holden Chapel (*bars* = 1 cm). *Top/left* to *bottom/right*: fragmentary vertebrae mounted on an iron nail (2009.4.298); glass medicine bottle (2009.4.326); leather shoe fragments (2009.4.104); stoneware ink bottle (2009.4.90); microscope slides trimmed from flat glass (2009.4.22); glass specimen jar lid (2009.4.16); glass footed specimen jar (2009.4.2); cranium of a juvenile canine (2009.4.339); bone and ceramic buttons (2009.4.257.1, 2009.4.257.6); rim fragments of a yellow ware bowl (2009.4.92); ceramic crucible fragments (2009.4.208). Peabody Museum of Archaeology and Ethnology, Harvard University © President and Fellows of Harvard College

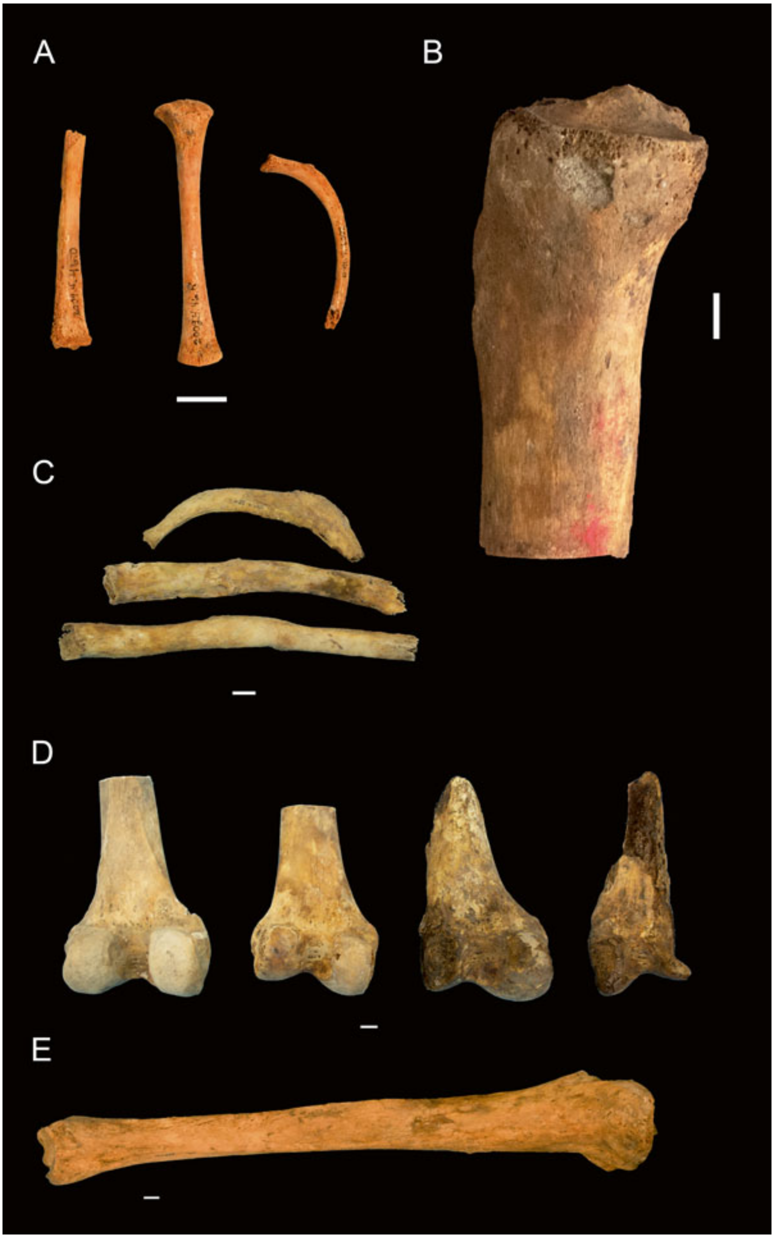

Fig. 6.3 Some human remains recovered from the fill of the basement dry well at Holden Chapel illustrating infant remains, weathering, pigment use, and trauma/disease. All scale bars are 1 cm. (**a**) infant remains (PMAE 2009.4.46.0); (**b**) tibia with cinnabar (PMAE 2009.4.167.0); (**c**) healed fractures on ribs (PMAE 2009.4.81.0, 2009.4.85.0); (**d**) weathering series of femora (PMAE 2009.4.137.0, 2009.4.138.0, 2009.4.139.0, 2009.4.382.0); (**e**) tibia with periostitis and osteomyelitis (PMAE 2009.4.161.0.) Peabody Museum of Archaeology and Ethnology, Harvard University © President and Fellows of Harvard College

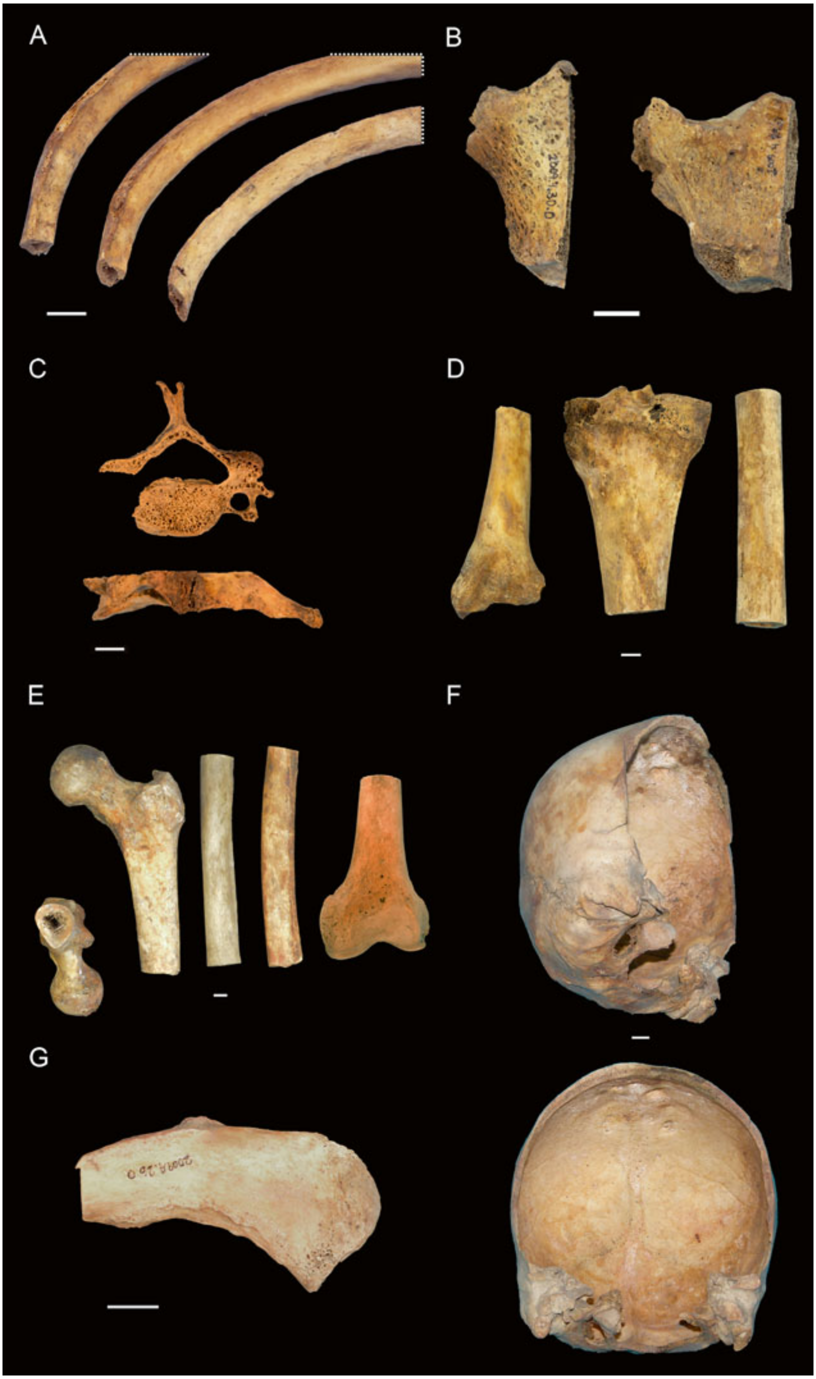

Fig. 6.4 Some human remains recovered from the fill of the basement dry well at Holden Chapel illustrating cut marks. All scale bars are 1 cm. (**a**) ribs (PMAE 2009.4.85.0); (**b**) sternae (PMAE 2009.4.29.0, 2009.4.30.0); (**c**) cervical vertebra (PMAE 2009.4.56.0); (**d**) tibiae (PMAE; 2009.4.159.0; PMAE 2009.4.164.0); (**e**) femora (PMAE 2009.0.382.0, PMAE 2009.4.383c, PMAE 2009.4.383e); (**f**) cranium (PMAE 2009.4.381.0); (**g**) clavicle (PMAE 2009.4.26.0). Peabody Museum of Archaeology and Ethnology, Harvard University © President and Fellows of Harvard College

The Holden Chapel collection offers unique insight into the materiality of early modern anatomical instruction. Holden is one of a handful of such sites in the United States, England, Ireland, and Scotland created in an educational setting without a hospital (Hull 2003; Kausmally 2012; Kehoe 1999; Keyes 2004). At most sites, anatomized remains and related artifacts were scattered and buried in dirt-floored basements or yards (Blakely and Harrington 1997a; Hull 2003; Kehoe 1999); or discretely buried in cemeteries (Council for British Archaeology 1997; Museum of London Archaeology 2006; Novak and Willoughby 2010; Owsley 1995). At a few, they were discarded with household trash (Chaps. 4 and 7; Hillson, et al. 1999; Mann et al. 1991). Holden's dry well is the only feature of temporary discard. It is also the only site from a New England institution that dates exclusively before the Civil War (1861–1865).

Methods and Frameworks

We broach this challenging context by combining approaches from bioarchaeology, historical archaeology, and historical ethnography. At issue are the roles of dead bodies within instructional systems of knowledge. Documents—including biographical accounts, secondary histories, student and faculty notes, letters, newspaper articles, and institutional records—qualify the finds from Holden Chapel and frame their significance. But they do not fully reflect the on-the-ground experiences of instructor, audience, specimen, and cadaver. This fact makes material evidence all the more important. Archaeological finds indicate that early instructional treatments of the dead were far more diverse, messy, and improvisational than written sources lead us to believe.

The project's theoretical orientations focus on the material world, bodily perception, and narrative as social reproduction. Within Western traditions, dead bodies have long occupied an equivocal position as a special "category of *thing*": not wholly object, not really person (Leighton 2010:79, emphasis original). The material relations of dissection were a "mechanism of power" by which social influence and status were reified (Capozzoli 1997:325). There is thus a compelling relationship between the treatment of dead bodies and the creation or destruction of personhood (Crossland 2009a; Leighton 2010; Tarlow 2011), which this study explores.

The process of "making" is particularly salient in instructional contexts. Bodies required instructors to disassemble, manipulate, and explicate them to become intelligible. This process betrays the hybrid material/corporeal nature of dead bodies. Further, a materiality-based approach rejects the Cartesian duality between mind/body and person/thing. Instead, it recognizes material culture's embedded, active role in orienting people to the world. This approach moves beyond discourses that privilege language or vision as a mode of cultural production. We not only consider how Holden remains reflected values but also identify the ways anatomical materials shaped cultural production by influencing human actors.

Similarly, embodiment approaches within archaeology analyze the body as material artifact, as well as the body as an active site of experience and agency (Joyce 2005).

The emphasis is on production over presentation and engagement over superficial appearance. Personhood is contextually defined through the body and related to identity and power. We therefore suggest that embodiment usefully frames the unstable object/subject divide created through anatomization, particularly the ways practitioners experienced their own and others' bodies (living and dead). Medical expertise was created and transmitted through embodied performance in lectures, study, and specimen preparation (Carr 2010; Foucault 1973; Hodge 2013).

The concept of narrative integrates the material and embodied engagements in which the Holden materials participated. Stewart (1993:ix) defines narrative as a "structure of desire that both invents and distances its object." At Holden, the narrative was the material/embodied performance of anatomical lecturing. The "desire" was to comprehend the workings of the human body and create an exclusive community of privileged medical knowledge. The "object" was the body itself, which participated in lectures as it was "invented"/explicated and "distanced" from personhood. A host of simulacra and translations (preparations, notebooks, sections, publications, drawings, etc.) furthered these efforts. In tracing the narrative of anatomical instruction, we trace agencies that emerged through relationships between human and nonhuman actors, especially living and nonliving bodies and body parts.

Nineteenth-century anatomists took advantage of slippage between commonly understood categories of person and thing to transform human remains into teaching materials. A new narrative emerged as practitioners disarticulated bodies' social identities (personhood) in order to construct idealized anatomical "subjects" (the terminology of period sources). These subjects then took on new roles as "non-bodies" (defined by Hodge 2013). This process was a material transformation marked on bones but oversimplified, idealized, or missing in written accounts. The Holden research project recovers both ritualized and improvisational actions within this material/embodied anatomical narrative. It further considers how anatomical acts impacted normative ethics and the legitimacy of personhood in nineteenth-century society. We discover that Harvard's anatomists were extremely effective, but never fully successful, at expunging individuality, traces of which linger in material and written archives.

Description of Human Remains from Holden Chapel

Overview

In 2014, the authors conducted a thorough inventory of all human remains recovered from the excavation at Holden Chapel. The collection represents a minimum number of 16 individuals, with more variability in the age of individual, condition of remains, and element representation than expected given the nature of the feature and an understanding of anatomization and other comparative collections (Blakely and Harrington 1997a; Chapman 1997; Davidson 2007; Museum of London Archaeology 2006; Sappol 2002). Of the 907 skeletal elements recorded from the Holden collection, 757 were identified as adult and 38 as the bones of juveniles

(Table 6.2). An additional 112 fragments could not be identified to element or anatomical siding could not be determined. This total includes numerous fragments of ribs and of elements of the appendicular skeleton.

MNI and Demographics

A minimum of 12 adult individuals is represented based on assessment of sided elements (see Table 6.2). Hand and foot bones represent 44 % of identified elements, a percentage similar to their actual representation within the complete human skeleton according to our method of counting skeletal elements (see Table 6.2). Axial elements, particularly rib fragments, are the next most common element, followed by thoracic vertebrae. Axial elements comprise 29 % of identified elements. This result is close to the expected value of 24 %. Appendicular elements comprise 18 % of all identified elements, an amount nearly twice the expected value of 10 %. In contrast, cranial and dental elements are greatly underrepresented and total only 9 % of fragments recovered. Based on composition of a complete adult skeleton, the expected value is 24 %. These totals reflect something besides a direct deposition of cadaver remains at the end of an anatomization cycle and taphonomic processes. Rather, they suggest complex post-anatomization treatment and dispersal. This pattern supports the interpretation of the Holden feature as a rapid fill episode/cleanup of unwanted collections and other detritus.

The 38 juvenile skeletal elements derive from a minimum of four individuals, including one fetus, two infants (estimated at 0–3 months of age and 6–12 months of age), and one child (estimated at 2–4 years of age). Only appendicular and axial juvenile remains were recovered, with no cranio-dental elements present for analysis. Infants and children usually were not favored dissection subjects, given their small size and lack of development; societal taboos also played a part (Blakely and Harrington 1997b:178). The presence of a child is therefore surprising. Infant bodies were used for preparations, however, and Harvard's anatomy lectures regularly covered fetal circulation and dental anatomy (Warren 1783; Warren 1814–1847).

Only five relatively complete innominates were suitable for sex estimation and indicate that both males and females are present in the skeletal assemblage. This finding reflects known instructional techniques. The acquisition of cadavers was opportunistic and involved both male and female bodies, the ideal was to alternate yearly between male and female subjects, and specimens were created from both male and female cadavers (Harrington 1905:450). The lack of cranial and pelvic elements also made it difficult to determine accurate age estimates, and therefore the relative frequency of age classes among adults is unknown.

Taphonomy

The appearance of the human and faunal remains from Holden Chapel ranges from essentially unweathered to very heavily weathered (Fig. 6.3). The state of bone preservation in archaeological contexts can be influenced by a number of factors including moisture and pH of the surrounding matrix, original condition of the bone when deposited, and subsequent chemical treatments (Henderson 1987; Manifold 2012; Ubelaker 1997). The amount of soft tissue remaining on the bone at the time of deposition may also affect its overall preservation and influence rates of natural deterioration. The bones of Holden Chapel show no apparent association between the degree of weathering and location within the feature. One must look to differential post-depositional treatment to explain this pattern (discussed below).

Cut Marks and Evidence of Anatomization

Cut marks were observed on 51 axial, appendicular, and cranial elements (Table 6.3). The sternal and rib elements were all cut sagittally (ribs at both proximal and distal ends) (Table 6.4, Fig. 6.4). This follows anatomical direction for preparations of the heart and thoracic duct: "With a saw divide the sternum in a longitudinal direction" (Pole 1790:64). Overall, ribs display the highest number of cuts ($N=18$). However, 50 % of all sternal, femoral, and tibial elements were sectioned, indicating that physical interaction between anatomists and these regions was pronounced, creating "hotspots" on a map of the anatomized body (see for comparison Fowler and Powers 2012; McFarlin and Wineski 1997). Vertebrae had the lowest prevalence of cuts, with marks observed on only 1 of 100 elements. This differs from finds in, for example, the Medical College of Georgia excavation, where 28 of 1209 vertebrae (12.3 %) have cut marks, making it the third largest category of cut postcranial bones after long bones and ribs (McFarlin and Wineski 1997:127). This difference may be due to the much greater sample size in that collection. No dental elements or hand or foot bones from the Holden Chapel collection were sectioned.

A single left clavicle is the only upper appendicular element that appears sectioned. The direction of the sagittal cut is inferior to superior (see Fig. 6.4). A volume on dissection from John Warren's library instructs preparation of superior

Table 6.3 Frequency and percentage of cuts on human skeletal remains from Holden Chapel

Element[a]	Total sample ($n=320$)		Cut sample ($n=51$)		Cuts per element
	Number	Percentage	Number	Percentage	Percentage
Cranial	35	10.9	4	7.8	11.4
Sternum	8	2.5	4	7.8	50.0
Rib	111	34.7	18	35.3	16.2
Vertebra	100	31.3	1	2.0	1.0
Clavicle	12	3.8	1	2.0	8.3
Pubis	7	2.2	2	3.9	28.6
Femur	18	5.6	9	17.6	50.0
Tibia	14	4.4	7	13.7	50.0
Fibula	15	4.7	5	9.8	33.3

[a]Excludes unidentified and unsided elements

Table 6.4 Distribution of cuts on human skeletal remains from Holden Chapel

Element or region	Proximal	Midshaft	Distal	Sagittal	Transverse	Other	Total number of cuts	MNE cut
Cranial						2	2	2
Mandible				2			2	2
Sternum				4			4	4
Vertebra					1		1	1
Rib—left	1		8				9	9
Rib—right	6		3				9	9
Clavicle—left			1				1	1
Pubis—left				1			1	1
Pubis—right				1			1	1
Femur—left	3	1	5				9	7
Femur—right	1	3					4	1
Tibia—left	4		3				7	5
Tibia—right	2		1				3	2
Fibula—left	1	2					3	2
Fibula—right		4	1				5	3
Total	18	10	22	8	1	2	61	50

extremities for study: remove the arms by disarticulating joints, not by cutting bone (Pole 1790:50). This practice may account for the relative absence of cuts on bones of the arms and shoulder. However, transection of the clavicle may have been necessary to expose the thoracic duct, vena azygos, and thoracic venae cavae. Dry preparations of these structures are included in an inventory of preparations created by the college and used for study (Warren 1814–1847). Pubic elements in the collection were also cut sagittally (see Table 6.4). This is consistent with direction for preparing lower extremities: "removed by section through symphysis pubis and sacroiliac joints, to create two halves" (Pole 1790:51). The lower appendicular elements have all been sectioned transversely, some with multiple cuts through the shaft (see Fig. 6.4). Among femora and tibia, left elements were sectioned more than twice as frequently as right elements.

Of note is the one coronally cut cranium represented by the posterior portion (see Fig. 6.4). The cranium was bisected through a progression of five to six cuts along the coronal plane, anterior to the mastoid processes and external auditory meatuses, anterior to the foramen magnum, and around the top of the cranial vault. Several hesitation marks made by the blade are visible near the right mastoid process. It is not a surgical cut; rather, it suggests the bones and perhaps tissue of the face and mandible were preserved for study, and that this remnant was discarded. A patch of remodeled bone is present on the remaining surface of the frontal, exhibiting pitting and deformation caused by infection. Most of the frontal (and all of the facial) bones are unaccounted for, and it is possible they were made into a preparation for study. This theory seems even more likely if the individual exhibited an infection, such as sores or lesions that altered the appearance of the head and face and marked the frontal bone.

Table 6.5 Observed pathologies on human skeletal remains from Holden Chapel

Pathology type	Anatomical region					Total by pathology type
	Cranial	Dental	Axial	Appendicular	Extremities	
Trauma (healed)	2		5	4	2	13
Infection	1	3		4	1	9
Osteoarthritis			5	12	5	22
Enamel hypoplasia		2				2
Other	1		1			2
Total by anatomical region	4	5	11	20	8	48

Disease and Trauma

Although the skeletons are fragmentary, and many elements weathered, the bones of these individuals reveal experiences of disease and trauma during life (Table 6.5). Osteoarthritis is the most commonly recorded pathology. Several bones show evidence of fracture and subsequent healing, including nasals and ribs (see Fig. 6.3), one metatarsal, one metacarpal, and one radius. Signs of infection are also seen in several bones of the lower leg, including a left and a right tibia and right fibula, which display the scars of periostitis and osteomyelitis, inflammatory conditions often resulting from infection after trauma but sometimes caused by a systemic infection (Ortner 2003: 181) (see Fig. 6.3). It is possible, though not certain, that these skeletal elements belong to one individual. Beyond the presence of injury and infection, the population represented by the Holden collections is too small to infer social status, quality or nature of medical treatment during life, lifestyle, or similar concerns. As the collections in the Warren Anatomical Museum and other anatomical museums attest, a person's remains were often selected for preparation to display particular pathology. In the case of Holden Chapel, the disease and trauma experienced by these individuals were not uncommon during the nineteenth century. Most likely, their deaths simply provided opportunities to procure dissection subjects.

History of the Harvard Medical School

Bodily violence suffered during the American Revolutionary War (1775–1783) advanced medical professionalization in the United States by demonstrating the need for practical anatomical instruction. As the war ended, Harvard started its Medical School and appointed alumnus and veteran John Warren as founding professor of Anatomy and Surgery. A library, "complete anatomical and surgical apparatus, a set of anatomical preparations with a proper theater, and other necessary accommodations for dissections and clinical operations" were requested (Harrington 1905:81).

The Board of Overseers also agreed "the Professors [will] demonstrate the anatomy of the human body on recent subjects if they can be procured; if not, on preparations duly adapted to the purpose" (Harrington 1905:81–82). The first lectures were in the basement of Harvard Hall, a mixed-use university building (still standing). Human remains from these first anatomizations—18 years' worth—have not been found.

In 1801, the Medical School took over about half of Holden Chapel, a small building located next to Harvard Hall. The structure had been damaged in the Revolution and then used as a storehouse (Batchelder 1921). In 1801, to convert it for medical instruction, Harvard added a second floor and partitioned an East Chamber (Medical Room I) for anatomy and surgery (Harrington 1905:288). After these renovations, HMS students and Harvard seniors attended anatomical lectures at Holden in the fall or winter (Harrington 1905:288–289). From 1801 to 1810, the chapel was Harvard's only building for medical instruction.

Even after HMS opened a new building in Boston in 1810, it held anatomical and chemical courses at Holden for medical students, which were taught after 1809 by John Warren's son John C. Warren (Harrington 1905:295, 368). This two-site model continued through 1825 (see lecture locations in Metcalf 1825–1826:71). After 1825, all HMS lectures were in Boston, but "Warren's lectures had proved so popular with the collegians that it was expressly stipulated that he should still deliver an annual course in anatomy and chemistry at Cambridge" (Batchelder 1921:412). Whether the seniors still experienced an anatomy demonstration on a fresh cadaver, or only specimens and preparations, is debated (see below, *Curriculum*).

From 1825 to 1850, Holden was reportedly "deserted" save for these yearly lectures, although certain undergraduates enjoyed "midnight forays" to acquire ornamental "fragments of the departed" from its anatomical collections (Batchelder 1921:413; Hayward 1850:21, 23, 25) (Fig. 6.5). In 1850, renovation added another skylight and curved, tiered seating for 150 to Holden's second floor, as well as glass cases to the first floor for the "museum" of human and comparative anatomical specimens, preparations, and curiosities (Bunting 1985:27). Yearly anatomy lectures for seniors continued as late as 1862 (the middle of the Civil War). They were discontinued by 1870, when the anatomical theater was turned into a theater for musical performances (Bunting 1985:27). The chapel was gutted and returned to its original one-room configuration in 1882 (Batchelder 1921:414–415; Harrington 1905:519, 536, 542).

Curriculum

Overview

HMS was created to professionalize medical education in New England. The 3-year curriculum always combined lecture, apprenticeship, and examination, while lecture courses grew longer, more specialized, and more diverse over time

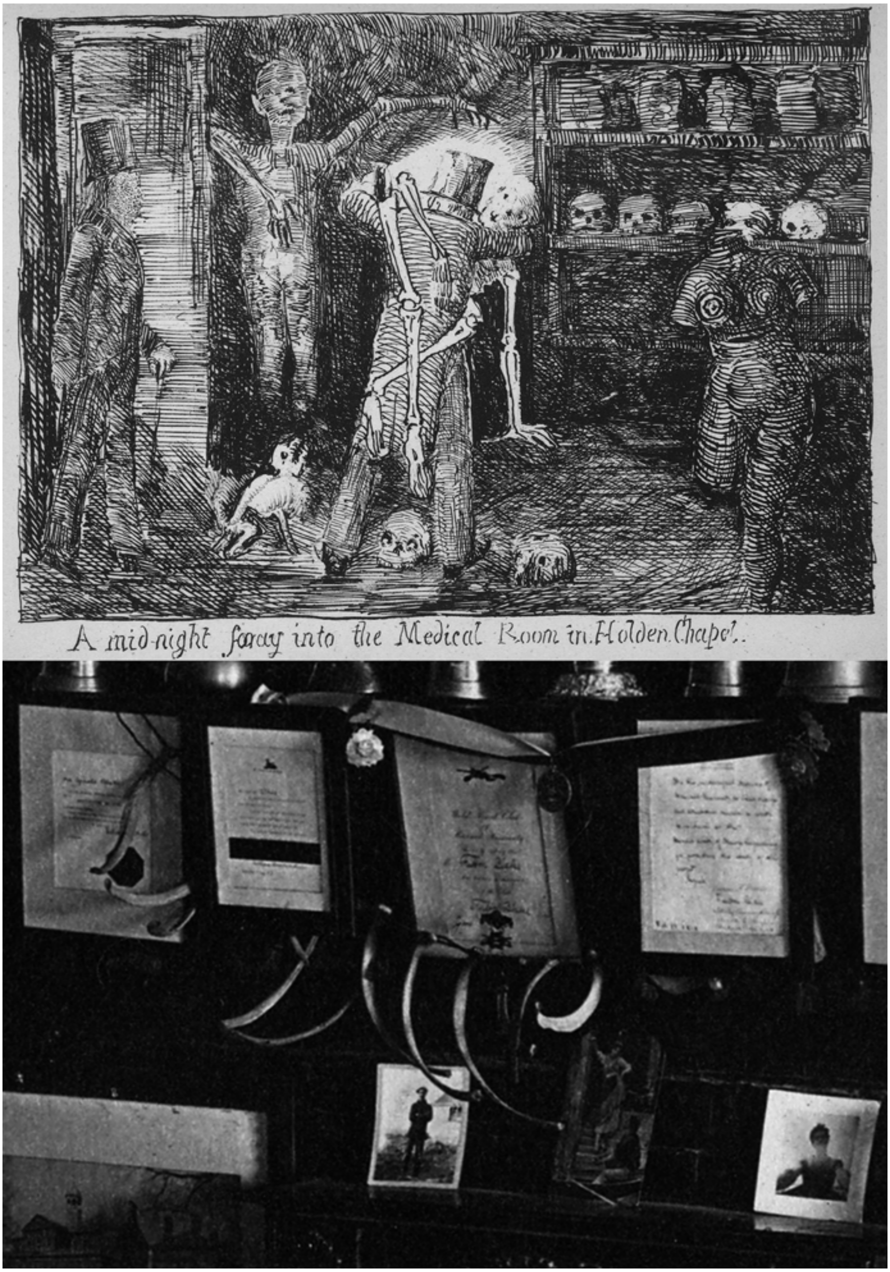

Fig. 6.5 *Top*: "A Midnight Foray into the Medical Room in Holden Chapel" from a Harvard College student's satirical depiction of undergraduate life, *College Scenes* (Hayward 1850:21). *Bottom*: Detail of a Harvard College student room, 1897 (Harvard University Archives, HUPSF Student Rooms 104). Ribs, possibly human, strung over the fireplace, displayed with other souvenirs and trophies. Courtesy of the Harvard University Archives

(Harrington 1905; Moore 1953). Dissection was believed essential to medical training. As John Warren ([1783]:n.p.) writes in some of his earliest lecture notes:

> At the first view of dissections, the stomach is apt to turn, but custom wears off such impressions. It is anatomy that directs the knife in the hand of a skilful [sic] surgeon, & shews [sic] him where he may perform any necessary operation … It is this which enables the physician to form an accurate knowledge of diseases & open dead bodies with grace, to discover the cause or seat of the disease, & the alteration it may have made in the several parts.

This discourse emphasizes the agency of bodies and biological processes at moments of physical engagement between anatomist and cadaver, as anatomy "directs the hand" and disease "alters the parts." He also writes, "books almost universally convey an imperfect idea of the situation of the parts" (quoted in Harrington 1905:447). For Warren and his contemporaries, the materiality of human remains gave them their instructional power. Practical knowledge of those remains gave medical professionals their authority.

Early HMS lectures covered Anatomy and Surgery, Theory and Practice of Physic, and Chemistry and *Materia Medica*. John Warren began the 6-week course with 6 lectures, which soon expanded to over 20 (Harrington 1905:450). His son's anatomy course included over 40 lectures in 3 months by 1810 (Harrington 1905:454; Norwood 1944:173). By the time Oliver Wendell Holmes taught HMS anatomy in 1850, the course ran for 78 lectures over 9 months (Holmes 1850–1882). Each lecture was 2 or 3 h long, and there were several each week, demanding a significant time spent in anatomical contemplation (Harrington 1905:88).

A survey of surviving notes demonstrates that the lecture sequence was not wholly under the instructor's control. It was contingent on the presence and internal organization of a cadaver. John C. Warren's (1814–1847) notes dated 14 April 1814 "at Cambridge" (Holden Chapel) cover anatomical dissection in 26 lectures: 4 on abdominal muscles and viscera; 2 on thoracic viscera; muscles of the face and neck; back and upper extremities; lower extremities; 2 on male organs; ligaments and cartilages; surgical amputations; 5 on bones; female organs; ear; heart and arteries; fetal circulation and teeth; eye; nerves; lacteals; and finally the brain. These lectures represent an ideal, performed narrative ordered by the human body (see also Harrington 1905:453).

Dead bodies were not always available, however. When no cadaver was present, the course *started* with bones. For example, Lyman Spaulding (1795) begins his notes, made at Holden Chapel, by describing different skeletal preparations, then describes the skull, bones of the face, vertebral column, etc. In lecture four, he writes: "A subject having presented itself we shall tomorrow begin a description of the muscles." A standardized dissection sequence, beginning with abdominal muscles, then begins. The moment a body was procured (euphemistically given agency as "presenting itself"), it redirected the course of study (changed the narrative) (Metcalf 1825–1826).

Before 1831, the dissection of anyone besides executed criminals and suicides was illegal in Massachusetts (Moore 1953:546). At that time, popular opinion reviled anatomization, physicians and surgeons stridently argued for additional legal sources of cadavers, and the bodies of society's most vulnerable members were appropriated on the way to, or taken directly from, their graves (Blakely and Harrington 1997a; Buchli and Lucas 2001; Davis, et al. 1831; Fabian 2010; Sappol 2002; Tarlow 1999). Medical professionals maintained that anatomical instruction from fresh human remains was necessary and foundational (Harvard Medical School 1906:1–14). The demand for subjects was so great that they were acquired illegally by HMS students, according to primary sources (Moore 1953:546).

Norwood (1944:170, 177) reports, "The Warrens faced with ingenuity the problem of obtaining anatomical specimens [before acts liberalizing procurement were passed in 1831, 1834, and 1845]. When body snatchers failed they took advantage of arms, legs, and other materials amputated at the hospital." "The hospital" was any of several institutions with which the Warrens were associated over the years, including the General Hospital in Boston (1777), where Warren had "command of subjects for dissection, without exciting alarm, or being reduced to the necessity of taking bodies from the burying-ground, as most of the inmates of the hospital were foreigners" (Eliot 1864:181–182); a small pox hospital in Brookline (1778–1779); and the state Almshouse in Boston (1782) (Warren 1874:74, 144, 165, 175, 288). James Jackson, a close friend of John C. Warren, became visiting surgeon to the Almshouse in 1809 (then the only teaching hospital in Boston) (Harrington 1905:371). In 1821, John C. Warren was put in charge of the surgical service at the new Massachusetts General Hospital (Harrington 1905:368, 373).

The passage of the Anatomy Act increased use of cadavers by HMS students but, surprisingly, not in undergraduate instruction. According to HMS historian Harrington (1905:357–358), after 1814, Harvard seniors were instructed from specimens and "costly" wax replicas, not anatomization. This shift came in spite of pressure from undergraduates to attend actual dissections. Primary sources support Harrington's assertion. John C. Warren's lectures from April 1814 are a "Cambridge Course" with a cadaver. Twenty years later, however, senior Samuel Parkman (1834) did not record a dissection in his "Notes on Lectures of Anatomy by Dr. J. C. Warren," made at Holden. Yet at that time, Warren was able reliably to procure subjects for HMS students who paid a five-dollar fee (Harrington 1905:475).

Therefore, during the decades HMS students enjoyed increasingly easy/legal access to cadavers, undergraduate access was increasingly restricted. No anatomization occurred at Holden Chapel for most of the years that anatomy was taught there (1801–1862): likely not after 1825, when HMS lectures were confined to Boston; possibly not after 1814. Instead, seniors learned anatomy from preparations and specimens. The fragmentary nature of remains from Holden's dry well, as well as the mixed nature of the deposit, reflects this specimen–centric approach. The semiotic relationship of body parts to whole persons is clearer if sequential anatomization is experienced. Harvard College students experienced human remains primarily as teaching specimens, with personhood significantly obscured. This fact may partially explain their use of human remains as trophy decorations.

On Specimens

Teaching collections were critically important to HMS. Instructors frequently used preparations to illustrate bodily structures and functions. These collections also served as ideological assets that bolstered reputations, demonstrated credibility, and cemented relationships within an international community of anatomical practice (Chaplin 2012; Mitchell and Chauhan 2012). HMS's numerous curricular aids included books, illustrative plates, European wax models, papier-mâché, and preparations (Harrington 1905:272–274). Early catalogues list hundreds of specimens from the "Anatomical Cabinet of the Massachusetts Medical College": injections, wax replicas, pathological specimens, animal specimens, and osteological preparations such as "healthy bones," "bones of the head separated and re-united with wires," "portion of the tibia exhibiting ulcerations," "portion of os femoris," "transverse section of the cranium showing the tentorium and longitudinal sinus," and "ligamentary preparation of the upper extremity" (Warren 1814–1847:n.p.).

In fact, making preparations was central to anatomical study. Local cadavers became teaching specimens (called "parts"): cut, mounted, dyed, dried, and chemically treated portions of human bodies. Holden's dry well provides evidence: soils contaminated with lead, mercury, and arsenic; glass tubing and pinned vertebrae (see Fig. 6.2); recovered pigments; and weathering of the bones themselves. Arsenic and mercury were used extensively as preservatives in the eighteenth and nineteenth centuries (Pole 1790; Swan 1820; Warren 1814–1847). Warren (n.d.) the younger kept detailed notes from a lecture on the "Art of Making Preparations," including by "injecting with quicksilver from glass tubes." Other notes advise using "arsenious acid and water" for the "Preservation of Dead Bodies" (Warren 1810–1824:n.p.).

Red pigment noted on a number of skeletal elements, glassware, and faunal remains is likely cinnabar or vermilion (mercuric sulfide), a compound commonly used in anatomical preparations of the era (Pole 1790; Swan 1820; Warren n.d.) (see Fig. 6.3). Volumes from Warren's library instruct anatomists to color prepared arteries with vermilion and veins with Prussian blue (Swan 1820:47). Sources detail formulas for preparation through injection of "Yellow bees wax, white resin, turpentine varnish, and vermilion" (Pole 1790:21). X-ray fluorescence (XRF) analysis conducted on Holden human remains and glassware with red pigment indicates high levels of mercury; adjacent non-pigmented areas yielded low levels. Analysis also confirmed high levels of arsenic and lead on human remains, faunal bones, and glass. It appears that many of the Holden human remains were intentionally chemically treated and that others were exposed to arsenic, mercury, and lead via discarded solutions or through proximity to treated materials once placed in the dry well. The degree of weathering on bones recovered from the dry well is likely due to differential treatment of individual elements before discard.

Disarticulation or cartilaginous cuts were recommended to separate arms and legs for study (Pole 1790:50–51), explaining the paucity of sectioning cuts in upper limbs from Holden. The approved method of preparing *and* of amputating arms was disarticulation at the shoulder joint (a surgery for which John Warren was famous)

(Pole 1790; Warren 1874:243). John C. Warren (1814–1847:n.p.) describes amputation techniques that match the condition of some recovered lower limb remains:

> On Amputating Below the Knee … If the limb be wasted, two inches will be necessary, but in operating directly after an accident, never less than three or four … Bones are now to be sawn through about 4 inches below the patella.

The cut marks on long bone sections from Holden Chapel indicate that surgical techniques were demonstrated on cadavers.

The boundary between subject and patient could become even more blurred. For example, during a dissection, John C. Warren advised HMS students, "When the testis swells this coat (Tunica Albuquinea) causes great pain … Cut open the testis"; "be careful and not put it [the probe] into the urethra as Dr. Warren did"; "Deltoides … Cut through this in Amp. [amputation] of S. [shoulder] Joint" (Metcalf 1825–1826:60, 64, 88). The relationship of dissection to surgery established equivalencies between living and dead bodies, creating ontological confusion between living patient and anatomical subject.

McFarlin and Wineski (1997:157) suggest that a focus on surgery and amputation in late nineteenth- and early twentieth-century medical training was a holdover from the Civil War. The prominence of these subjects in Harvard's curriculum suggests the tradition was ingrained earlier and relates to the Revolution. Because undergraduates saw and heard less about the treatment of patients than HMS students, they may have regarded anatomical subjects more as things and less as people.

Students furthered this process by bringing sections home for private study. In his memoir of HMS, the French physician Pierre de Sales La Terrière writes of four executed criminals whose bodies were brought to Harvard, "I did not lose a single hair of them, but analyzed every part at the amphitheater [in 1788 still in Harvard Hall] and then took it home to depict on paper" (quoted in Heald 1910:521). Note the transition from "them" (complete bodies of executed prisoners) to "it" (parts)—an ontological shift from person to thing created by the dissection process. La Terrière also wrote candidly of body snatching. He and other HMS students robbed the grave of a widow, even though she had a family; they were not caught. He bragged about studying her corpse in the anatomical theater and "the myological work that we offered to the [Harvard] Corporation on the day of the Exhibition [public Commencement], and which was placed in the museum" (quoted in Heald 1910:521). The popular guide to making preparations by Swan (1820:4) advised injecting oxymuriate of mercury into a prepared limb to reduce smell (facilitating clandestine preparation), as "the dissection may be carried out in any place, and at any season of the year, as every offensive smell is generally entirely prevented." The high mercury content of the Holden feature suggests preparers followed Swan's advice.

Cadaver parts were further disassociated from each other during discard based on element. The high percentage of appendicular remains (18 % rather than the expected 10 %) indicates that arms and legs stayed in the Holden building longer, or were brought to it more frequently, than other body parts. These remains circulated—literally distributing personhood—during dissection, preparation, and/or study.

Cranial remains show a different pattern. Racism, phrenology, and evolutionary theory powerfully influenced nineteenth-century scientific practice and in turn were shaped by it (Fabian 2010; Gould 1996; Thomas 2000). Always culturally charged, crania were highly prized by period scholars. In this context, one expects cranial remains to be overrepresented within the discarded Holden collection. Instead, they are underrepresented (9 %, not the expected 24 %). It is plausible that crania were prized *so much* more than arms, legs, and axial elements that they were either taken as mementos or saved for the HMS collection in Boston.

Aside from indicating specimen preparation, dismemberment and distribution of dissected remains also suggests inadequate cadaver supply (McFarlin and Wineski 1997:159). We conclude that archaeology at Holden Chapel recovered a collection of discarded specimens as much as a collection of anatomization debris.

On the Roles of Bones

In the early nineteenth-century, bones were the conceptual and actual "foundation" of anatomy but presented practical challenges. In his 1783 introductory lecture, John Warren ([1783]:n.p.) told attendees "The Bones are necessary to give firmness and shape to the body, to be levers to the muscles, and to defend the parts most necessary to life." Instructors describe bodies as a physical system built upon, and animated by, the skeleton. An explication of recent vs. dry bones, taken from a 1795 introductory lecture at Holden, states:

> A recent one [skeleton] is when the bones are joined together by Ligaments & the cartilage as the animated human body—A dry or artificial one when the bones are divest of this ligament & are connected by art & admits of nearly the same motions as the recent one. (Spaulding 1795)

The pinned vertebrae from Holden's dry well materialize efforts to maintain/simulate anatomical form and function (see Fig. 6.2). Students' notes typically begin with prepared bones, shift to dissection if a "subject" is procured, and then describe disassembly that exposes the foundational bones again (Metcalf 1825–1826). The impulse to understand bodily function (from the inside out) contradicted the necessary sequence of anatomical dissection (from the outside in).

John C. Warren so valued the skeleton that he donated his own to HMS. He wrote in 1842:

> Regards the disposition of my mortal remains … [The bones should be] carefully preserved, whitened, articulated, and placed in the lecture room of the Medical College, near my bust; affording, as I hope, a lesson useful, at the same time, to morality and science. (quoted in Harrington 1905:658)

Warren explicitly connects mortality with morality and morality with osteological specimens—at least those artfully prepared. He also equates his whitened bones with his white marble portrait bust. Through simultaneous exhibition, they could retain an iconic relationship to each other and his living self (for Peircian semiotics surrounding dead bodies see Cashell 2007). Warren was empowered as a successful, white, male, educated, politically connected medical professional. He extended his personhood by controlling his body after death. His skeleton, prepared as instructed, is kept at the Warren Anatomical Museum in Boston. This fate is worlds away from that of the 16 plus "subjects" whose fragmentary remains were mixed with trash and forgotten beneath Holden Chapel. This material discrepancy highlights the space between early anatomy's rhetoric and reality and between the fates of privileged and exploited bodies.

These nineteenth-century perspectives on the human skeleton justify scholars' continuing concern with osteological remains as indexes of past medical practices and emerging social values. With the final quotation from Warren, discussion returns to the notion driving Furness: that the dead teach the living, and that their wisdom extends beyond symptoms of disease or courses of treatment.

On the Imperfect Teachings of the Dead

Period sources are preoccupied with understanding and describing bodies' material qualities and affordances. The difficulty cadavers posed as instructional materials is also highlighted in writings and manifested by excavated remains. Treatment of dead bodies reveals the ways anatomists struggled to reconcile embodiment, materiality, physicality, and remnant personhood or social identity.

Anatomists strongly favored human remains over artificial specimens. As John C. Warren writes in *An Address to the Community on the Necessity of Legalizing the Study of Anatomy*,

> Some may perhaps believe that books, and plates, and wax figures convey adequate options of the human structure. This is an opinion natural enough, but entirely erroneous … It is probable that a single square inch of the human body contains more parts distinctly organized, than could be represented by all the wax figures which ingenuity has ever contrived. (in Davis et al. 1831:117)

His father, at least once, apologizes for not having a "recent subject" at hand and lecturing from "cuts and other demonstration materials" (Moore 1953:546).

Yet the valuation of bodies and parts was not straightforward. After dissecting a dog and applying artificial respiration, Metcalf (1825–1826:47–48, 51) writes,

> [You] see nothing of minute vessels on the Dead Body so that one instance of this is of more value than any dissection of Dead Bodies. … So minute [are the bronchioles] that we do not know their form, and the best way to demonstrate and in fact the only way, is by injection of some thing.

This quotation first expresses frustration with human cadavers vs. the artificially animated near-living flesh of a vivisected dog. Then, it critiques both authentic sources in favor of artificially enhanced prepared lungs. Preserved specimens were transportable, relatively durable, and predictable. They were made to highlight certain features, such as a mended bone break or the sequential relationship of vertebrae, while removing distracting or irrelevant portions. A segment from a paralytic subject had “Muscles very much wasted … Post Tibial Nerve very much enlarged perhaps from inflam[mation]” (Metcalf 1825–1826:84). Thus, even in prepared teaching tools, traces of individual experience of disease (personhood) lingered.

The range of preparatory practices seen in the Holden collection was an attempt to reproduce the ideal that structure equals function. Therefore, to perfectly understand function, one must perfectly reproduce structure. Yet all kinds of teaching materials—even authentic bodies—were limited in their accuracy, longevity, and, therefore, utility. “Real” bodies were not always more prized because of their closer relationship to living persons, which seems counterintuitive. The degree to which practitioners intervened, manipulating human materials to arrest decay and more closely approximate living function, or to exaggerate distinctive sensory qualities for teaching purposes, are important vectors within this categorical scheme. The kinds of “non-bodies” were multiple (Hodge 2013).

Reflections

Findings

Ethnohistorical, bioarchaeological, and archaeological evidence reveals how nineteenth-century anatomists distanced instructional remains from their former personhood. This process reconceived an older narrative of body parts as inherently disordered (Stewart 1993:104–131), putting them to work in a new narrative of ordered medical knowledge. Medical discourse proposed that anatomical instruction was organized, structured, and controlled. Improvisational reactions to instructional cadavers, described above, suggest otherwise. The illegal acquisition of bodies was inherently disordered. Even the use of the Holden Chapel dry well violated the 1831 Anatomy Act, which stipulated that, after serving “the promotion of anatomical science,” “the remains thereof shall be decently inhumed” (Davis, et al. 1831:3–4). Nevertheless, documents and material remains prove that the transformation of people into “subjects” at Holden was extremely effective.

The Holden Chapel collection bridges a transitional period in “The contemporary Western approach to death … to remove it from the public sphere and into the hands of professionals” (Leighton 2010:79). As early as 1814, anatomical performances were moved from Harvard College to the Medical School campus in Boston, segregating professional instruction from undergraduate and creating a hierarchy of learning. As the curriculum was elaborated and standardized, new narratives of the body were created through material practices of instruction. These regimes increasingly concentrated knowledge within a privileged community. In the later nineteenth century, HMS narrowed access. Anatomical medical expertise became more esoteric, more private, and more restricted. The increasingly limited exposure of undergraduates to human anatomy via both cadaver dissection and, eventually, specimens was a casualty of the professionalization of medicine.

Lessons

In these ways, anatomical instruction reinforced values of scientific rationalism and reformed broader social values, but its affective aspects are as important. The presence of human remains is dangerous, emotionally and spiritually, in ways that have changed over time. Today, doctors report real or anticipated difficulty "separating the cadaver from the person it recently was" and worries about causing pain, retribution, and offense (Capozzoli 1997; Roach 2003:11–12). Nineteenth-century students and instructors had a different concern (Warner and Edmonson 2009:9–10). In 1850, John Ware (1851), HMS Professor of the Theory and Practice of Physic, cautioned aspiring practitioners that "the tendency of the habit of dissection is to produce a difference between us and other men …" and to destroy the "tender and almost sacred" reverence usually held for deceased persons/bodies. He warned, "The [emotionally hardening] influence exerted [by dissection] is so gradual, the change in our habits and feelings is so insensibly brought about, that we are not aware that it has taken place." Nineteenth-century anatomical instruction worked against personhood, and the Holden Chapel collection helps us to understand how.

The destruction of personhood at early HMS was so effective, it has undermined present efforts to recapture recognizable signs of individual personhood through investigative scholarly methods (sensu Crossland 2009b; for example see Heilen et al. 2012). This goal is central to the volume overall, and it is a strong theme in historical studies of anatomization broadly, which find that human dissection contributed to gender-, race/ethnicity-, and class-based structural violence within the United States (Blakely and Harrington 1997a; Davidson 2007; Nystrom 2014). Study of the Holden Chapel collection suggests that when studying the "teachings of the dead," sustained attention needs to be paid to materiality of body, specimen, and segment—not only their symbolic relationships to deceased persons, but also the ways they formed students' relationships with both the living and the dead.

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Chapter 7
Skeletal Evidence of Anatomical and Surgical Training in Nineteenth-Century Richmond

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The use of human cadavers in medical instruction and training has been studied by social scientists, historians, and physical anthropologists (Harrington and Blakely 1995; Mitchell 2012; Owsley 1995; Richardson 2000; Warner and Edmonson 2009). The practice is long-standing, international in scope, and intricately connected to the development of modern medicine and surgery. Also evident is the historical use of bodies from marginalized segments of the population as cadaver specimens, although there seems to have been no definite boundaries that excluded individuals of a particular age, sex, or ancestry.

This study adds to the limited amount of evidentiary data derived from skeletal remains associated with nineteenth-century medical schools in the United States by reporting on bones found during construction on the Medical College of Virginia (MCV) campus of Virginia Commonwealth University (VCU). Archival records of the school describe the use of cadavers in early medical teaching at the institution and

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shed light on the often clandestine means by which bodies were obtained. As artifacts of these activities, the human remains augment the written history, providing tangible evidence for the types of dissection and surgical training by the school's faculty and students. Additionally, the bones provide a means to identify those whose bodies were used in this training. This information is not clearly expressed in the archival record and can only be made known through systematic study of the bones.

Discovery and Investigation

Discovery occurred in 1994 when a construction crew on the MCV campus of VCU uncovered a circular, mortared, brick well that contained animal bones, building debris, broken ceramics, leather, fabric, medical implements, and a large quantity of human bones. The construction company dug the feature with a backhoe to a depth of 30 feet at which point the soil was too waterlogged to remove the estimated ten more feet to reach the well's bottom. This non-archaeological removal using heavy machinery resulted in a commingled assemblage of material that required sorting, identification, and dating.

Human bones and a total of 423 artifacts and faunal bones were non-systematically retrieved from the back-dirt pile by VCU archaeologists. Artifacts date the well to the first years of operation of the nearby Egyptian Building, opened in 1844 and built to house the Medical Department of Hampden-Sydney College (MDHSC) (Blanton 1933; Virginia Department of Historic Resources [VDHR] Records). The Egyptian Building contained an infirmary, patient beds, lecture rooms, and a dissecting room. The well appears to have served as a repository for items considered waste by the medical college around this time based on its contents, which included objects associated with the medical profession (Fig. 7.1) and the abundance of well-preserved human bones, many of which display evidence of autopsy and dissection.

Medical Training in Nineteenth-Century Richmond

The VCU School of Medicine traces its origins to the November 1838 opening of the Medical Department of Hampden-Sydney College (MDHSC) in the commonwealth's capital of Richmond. In 1854 the faculty secured a charter from the Virginia General Assembly to become the Medical College of Virginia (MCV), severing ties with Hampden-Sydney College. In 1860 the MCV expanded its facilities and became a state institution (Blanton 1933, 1963).

From the beginning, the faculty stressed the importance of practical anatomy as the foundation of a modern medical education, and like many medical schools of the time, promoted themselves based on opportunities for this type of training. In the era of didactic and theoretical instruction, hands-on anatomy courses and surgical training using cadavers comprised the most significant part of a student's medical education

Fig. 7.1 Medical glassware consisting of a test tube, broken pharmaceutical bottle, and thermometer. Bone scalpel handles flank an English creamware ointment pot, ca. 1820–1840 (image: Merry Outlaw)

(Rothstein 1989; Stowe 2004). The MDHSC faculty believed that Richmond was ideally suited, both in terms of population and climate, for a medical institution that focused on training through work with cadavers. In an 1853 address to the public regarding the affairs of the MDHSC it was stated, "While at Richmond, not only is the supply of subjects ample, but the temperature is such as to allow dissection to be continued without interruption from October until March" (*An Address to the Public in Regard to the Affairs of the Medical Department of Hampden Sidney College* 1854). In regard to its residents, by the late 1830s Richmond had emerged as a growing industrial and manufacturing city, in addition to having a significant slave trade. Its population of 20,000, including 7500 enslaved and 1900 free blacks (Takagi 1999) could more than satisfy the clinical and anatomical requirements of a medical school. While not endorsing the robbing of graves, the MDHSC faculty noted: "from the peculiarity of our institutions, materials for dissection can be obtained in abundance, and we believe are not surpassed if equaled by any city in our country" (*Catalogue of the Officers, Students, and Graduates of the Medical College of Virginia Session, 1858–59* 1858, 14; *Announcement of 1859–60 Session* 1859).

The anatomy demonstrator procured, by whatever means possible, the cadavers required by the professors of anatomy and of surgery. The demonstrator was also tasked with finding an "appropriate place to deposit the refuse matter from the dissecting rooms" (Minutes of the Faculty, 31 July 1849). Faculty minutes do not reveal where or how disposal was achieved, but an 1856 regulation specified the demonstrator "shall see that the offal is not allowed to collect in the dissecting or dead room and shall deposit it in the sink [well] provided for that purpose" (Minutes of the Faculty, 22 March 1852).

Acquiring cadavers was the greater problem. However, public officials generally ignored grave robbing activities and those engaged in the practice, particularly when slaves or free blacks were the target. They did, however, recognize the common practice and in 1848 strengthened the Commonwealth's law for "violation of the sepulcher" by adding a jail sentence of 1 year and a fine of no more than $500 (*Code of Virginia* 1849, Chapter 196, Section 13, 740).

To avoid these charges, demonstrators and professors of anatomy employed agents or dealt directly with "booty men," also called "resurrectionists," who obtained bodies from fresh graves or through other means (Joseph Johnson to the General Assembly, 22 March 1852 in *Journal of the House of Delegates for the Session of 1852*, 1852, 265–66). On occasion, demonstrators had to serve in this capacity, one stating that "To continue my lectures I was forced to play resurrectionist myself by no means a pleasant profession when the snow is 8 in. deep and the thermometer near zero" (Arthur E. Peticolas to John Staige Davis, 21 January 1856, Davis Papers).

Richmond's potter's field and the Negro burial ground were targets for resurrectionists and were just over a mile from the medical college (Blanton 1963; Scott 1950). The school also placed two medical students to serve the almshouse, which according to accounting records provided anatomical materials to the medical college (Dean's Account Book, Special Collections and Archives, Tompkins-McCaw Library, Richmond, VA). Also located a mile from the medical school, the state penitentiary and its convict cemetery represented another potential source for bodies. Several faculty members served as the house physician to the penitentiary, giving medical students entree to another clinical learning experience. On average, 12 men a year died at the penitentiary in the period between 1853 and 1859 (Patterson 1860, 104–105).

The medical school's infirmary served as the students' primary clinical learning lab and may have been the biggest source of bodies. The infirmary and facilities for anatomical dissection were greatly enhanced when the MDHSC moved from rented quarters in the fall of 1844 to the Egyptian Building. This new facility included an infirmary consisting of wards and private rooms, three lecture halls, and a spacious dissection room. Care was extended to all races and classes, but the infirmary was frequently patronized by itinerant workers, owners who sought treatment for their slaves, free Blacks, and immigrants. The faculty treated an average of 200 patients a year between 1855 and 1859. The number of deaths that occurred in the infirmary is unknown. In one quarterly report, the dean noted that eight patients had died out of 39 admissions. By the late 1850s, rumors had spread through the Richmond community that infirmary patients could wind up as cadaver specimens on the medical school's dissecting table. A newspaper editorial stated "many of the Negroes laboring in Richmond are, for the want of room and nurses, sent to the Infirmary of the Medical College when they are taken sick. Among them there prevails a superstition, that when they enter the Infirmary they never come out alive" (*The Daily Dispatch* July 21, 1854). The perception that the college's medical students dissected infirmary patients had become so pervasive by 1860 that the faculty was compelled to take out an advertisement to deny the charges. In defense of the college, Dean Levin Joynes wrote "no patient dying in the Infirmary, whether white or black, is ever sent to the dissecting room; but the body is in every case decently interred in the public burying grounds" (*The Daily Dispatch* 14 February 1860; Dean's Account Book, 13 February 1860).

Despite the public's concern, the medical school faculty nevertheless obtained an adequate number of bodies to support both anatomy instruction and surgical demonstration. From the fall of 1844 when the school first moved to Academy Square through the conclusion of the 1860–1861 term and opening of a new hospital structure, 1480 men attended classes at the medical college with 439 earning medical degrees. No documentation has been uncovered that reveals the number of cadavers procured to support instruction for this number of matriculates. Although the faculty requested that the professor of anatomy provide a monthly accounting of cadavers supplied to each class, no such reports are found in the minutes of faculty meetings. However, based on faculty correspondence one can extrapolate that a minimum of 18–24 bodies was needed for each term. A reported 27 cadavers were sent to the University of Virginia in Charlottesville during the 1858–1859 session, which suggests the medical campus in Richmond probably took in about 54 bodies if the two schools adhered to the prearranged formula of keeping two-thirds of the recovered bodies in Richmond and sending the remaining one-third to Charlottesville (Carter P. Johnson to John Staige Davis, 19 December 1847, Davis Papers).

In 1859 the faculty of the medical college (now known as the Medical College of Virginia, or MCV) sought support from the Virginia General Assembly to accommodate a growing student body and infirmary patient population. In March, 1860, the legislature appropriated $30,000 for this purpose in exchange for college property. With this transaction, MCV formally became a state institution (Blanton 1963). The faculty opted to build a new hospital instead of adding to its existing facilities. The building was to be situated on existing college property just west of the Egyptian Building. A detailed list of disbursements for the project in the Dean's Account Book (1856–1871) shows two entries of particular interest. On 20 October 1860, the college paid Jacob Holloway $151.62 for "digging and bricking up sink [well] under college." A month after closing the old well, Joynes recorded a transaction for "rope used in digging sink." A February 16, 1861 entry in the Dean's Account Book recorded the purchase of "rope & well-wheels for dissecting room." This evidence indicates that MCV sealed one well and dug another during the construction of the new hospital. It is difficult to prove conclusively that the well closed in October 1860 was the same one uncovered by construction workers while excavating west of the Egyptian Building in 1994. The datable artifacts and the location of the well in close proximity to the remaining foundation of MCV's original hospital structure suggests that it was sealed prior to the opening of the new clinical facility in April 1861 and was therefore used by demonstrators of anatomy to dispose of human remains sometime between 1848 and 1860.

Human Skeletal Remains

A 2011–2012 study of the human remains from the well entailed identification and sorting of the commingled elements, reassociation, and systematic collection of osteological data for each bone using standardized methods in bioarchaeology and forensic anthropology (Buikstra and Ubelaker 1994; Owsley and Jantz 1989). Bones were sorted by type (cranial and postcranial), element (e.g., humerus, femur and tibia), side, and size (largest to smallest), and were evaluated for age and sex, evidence of trauma, and pathological features indicative of disease or degenerative changes. Postcranial measurements and three-dimensional cranial coordinate data were collected. Bone by bone comparisons noting similarities in preservation, relative size and shape, color, distinguishing pathology, and matching joint articulations facilitated their pairing. This made it possible to determine whether entire bodies, limbs, or isolated elements comprise the series.

Bone counts of the primary elements recovered reveal a minimum of 44 adults (individuals 15 years and older) and 9 children (ages 14 years and younger). This number is based on high counts of adult right tibiae and right femora for children, plus a newborn represented by two ribs only. Most of the cranial and mandibular bones are those of males aged 35 years or older. No cranial bones of children younger than 12 years are present.

Bilateral pairing of humeri and femora suggest that somewhat less than half of the remains represent complete or nearly complete bodies, as opposed to partial limbs that may have been removed during dissection or surgical procedures, such as amputations. For humeri, 19 matched pairs were identified. For femora, 18 pairs were recognized. Comparable matching of the upper and lower limbs was not done due to missing intervening elements. Yet, there is consistency in the numbers of paired upper and lower bones, suggesting that the recovered deposit represents at least 19 fairly intact bodies plus partial remains of an additional 34 individuals. Cranial and postcranial associations were not attempted, however, the number of crania (18) represented by more than a single bone or sectioned calotte is consistent with the counts for paired limb bones.

Evaluation of crania for age, sex, and ancestry provides additional insight into the demographic composition of the series. Of the 26 complete and partial crania (Table 7.1), 17 are male (65 %), eight are female (31 %), and one is of indeterminate sex due to its young age and incompleteness. Two crania display features consistent with European ancestry and six crania have indeterminate ancestry due to incomplete representation. Eighteen crania are identified as having African ancestry. This supports the assertion that free and enslaved Blacks in the white-dominated society of the South were the most vulnerable to grave robbing and the illicit body trade (Savitt 1978, 1982, 2007).

Craniometric analysis assessed ancestry, as well as variability within the assemblage. Cranial measurements defined by Howells (1973) were obtained using a digitizer as described by Ousley and McKeown (2001). The total number of measurements is 61, but many skulls are broken resulting in incomplete measurement sets. Each cranium was compared to a range of Blacks and Whites representing different populations (Table 7.2) to ascertain to which group it was most similar. The American samples are stratified by time into early nineteenth century, late nineteenth century, and twentieth century cohorts. These subdivisions, to some extent, control for secular changes that the American population has experienced (Jantz and Meadows Jantz 2000; Spradley 2006). Similarity was assessed by the

Table 7.1 Crania and unmatched mandibles in the VCU series

Burial no.[a]	Age	Sex	Ancestry	Pathology
V01C (cranium and mandible)	35–44	M	African	Lytic lesion in rt. maxilla. Dissection cuts
V02C (cranium and mandible)	35–44	M	African	
V03C (cranium and mandible)	35–44	M	African	
VO4C (partial cranium and mandible)	45–54	M	European	Perimortem injury: wooden spike in lateral margin of lt. orbit
VO5C (partial cranium)	35–49	M	African	Moderate TMJ[b] degeneration
VO6C (cranium and mandible)	45–54	M	African	Healed nasal bone fractures. Dissection cuts
VO7C (cranium)	45–54	M	African	Slight TMJ erosion and porosity
VO8C (cranium and mandible/M08C)	60+	M	African	Slight erosion rt. TMJ
VO9C (cranium)	35–44	F	African	Healed nasal bone fractures, moderate TMJ degeneration
V10C (cranium and mandible)	55+	M	African	Slight TMJ degeneration
V11C (cranium and mandible)	70+	M	African	Lt. TMJ erosion/porosity
V12C (cranium and mandible)	40–49	F	African	Perimortem cut in frontal bone
V13C (partial cranium)	30–39	F	African	Slight erosion rt. TMJ
V14C (cranium)	50–59	M	African	–
V15C (partial cranium)	45–54	M	African	Healed depression fracture in frontal, healed lt. nasal fracture, perimortem fracture in frontal/rt. parietal
V16C (partial cranium)	35+	M	European	Slight hyperostosis frontalis interna
V17C (cranium)	35–44	M	African	Slight scaphocephaly
V18C (partial cranium)	21–24	F	African	–
V19C (autopsied calotte)	50–59	M	?	–
V20C (autopsied calotte)	30–44	M	?	Perimortem GSW and trephination
V21C (autopsied vault)	30–39	F	African	Widespread caries sicca/tertiary syphilis
V22C (autopsied calotte)	20–29	F	African	–
V23C (partial right parietal)	12–17	?	?	–
V24C (autopsied calotte)	40–54	M	?	Healed depression fracture in rt. parietal, ectocranial porosity
V25C (partial left parietal)	16–24	F	?	–
V26C (autopsied vault)	20–34	F	?	–
M01C	40–55	M	African	Slight erosion and porosity of condyles
M02C	40–59	M	African	Cuts from dissection
M03C	50–59	F	African	

(continued)

Table 7.1 (continued)

Burial no.[a]	Age	Sex	Ancestry	Pathology
M04C	50-plus	F	African	Slight erosion and porosity in left condyle
M05C	30–49	M	European?	Fine cuts from dissection
M06C	55-plus	F	African	Possible perimortem fracture of symphysis
M07C	60-plus	F	African	
M09C	25–29	F	?	Dissection cut through symphysis
M10C	30–34	F	?	Dissection cut through symphysis

[a]Burial numbers "V01C-V26C" represent complete or partial crania with and without associated mandibles. Burial numbers "M01C-M10C" represent complete or partial mandibles not associated with crania.
[b]*TMJ* temporomandibular joint

Table 7.2 Comparative samples used in metric analysis of VCU crania

Sample	No. males	No. females	Birth years	Location
Gold Coast	9	10	Nineteenth century?	Ghana
Ashanti	17	13	Nineteenth century?	Ghana
Calabar	18	7	Nineteenth century?	Nigeria
Zulu	55	46	Nineteenth/twentieth century	South Africa
Am. Blacks Early nineteenth century	10	17	Late eighteenth century to 1825	Eastern US
Am. Blacks Late nineteenth century	80	82	1850–1899	Midwest US
Am. Blacks twentieth century	32	33	1920–1970	US
Berg	56	53	Eighteenth century	Austria
Norse	54	54	Medieval	Norway
Zalavar	53	45	Medieval	Hungary
Farringdon St.	31	39	Seventeenth century	London
Croatians	30	4	Nineteenth century	Croatia
Portuguese	69	64	Twentieth century	Lisbon
Am. Whites Early nineteenth century	20	1	Late eighteenth century to 1825	Eastern USA
Am. Whites Late nineteenth century	97	80	1850–1899	Midwest USA
Am. Whites twentieth century	99	69	1920–1970	USA

Mahalanobis distance of each skull from the mean vector of the reference groups. A description of these methods can be found in Jantz and Owsley (2001).

Strong African affinities are expressed in the morphometric analysis of some of these crania, while others more closely align with American Blacks. These two groups show considerable differentiation (Jantz and Meadows Jantz 2000; Spradley 2006), and the fact that some crania align more closely with the former may indicate they

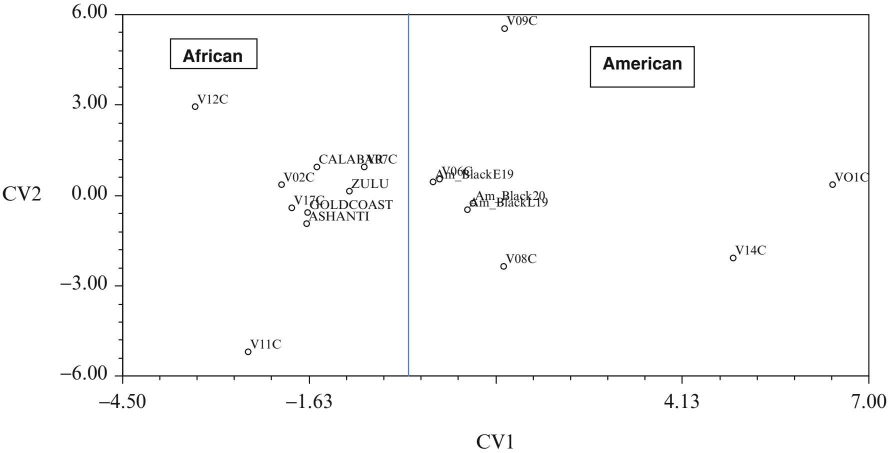

Fig. 7.2 Canonical plot of American and African Blacks with VCU crania included. Variables: BBH, XCB, XFB, AUB, NLH, NLB, OBH, FMB, NAS, WMH, GLS, FRC, PAC, OCC, FOL, NAR, SSR, ZOR, FMR, EKR, ZMR, BRR, LAR, OSR, BAR (see Jantz and Ousley 2005)

are first generation Africans or descendants of Africans without significant admixture. The nature of these relationships can be better appreciated by means of a two-dimensional canonical plot (Fig. 7.2). Canonical variate 1 (CV1) serves as an African Black-American Black discriminator, the approximate sectioning point indicated by the vertical line. The VCU crania with African ancestry form a bimodal distribution, falling on either the American or African sides. The morphometric features reflected on the first axis are mainly vault and upper facial breadths (Americans wider than Africans), and nasal breadth (Americans narrower than Africans). The number of variables is reduced because a complete subset for all crania is required. Nevertheless, it reflects the African-American dichotomy. The atypical morphology of several crania is also reflected by their locations on the margins of the plot. Canonical variate 2 (CV2) serves mainly to distinguish cranium V09C from skull V11C, both of which are atypical, but in opposite ways. Cranium V09C has wide mid and upper facial dimensions, while the dimensions of skull V11C are narrow. The American and African comparative populations are minimally differentiated on CV2. These results reveal a potential biological means of evaluating nineteenth-century Richmond population diversity, and more specifically the diversity of the population subject to use in medical teaching and training.

Evidence of Amputation, Dissection, and Surgery

Thirty-five cranial and mandibular elements and 42 postcranial bones show evidence of intentional sectioning consistent with dissection and training in surgical procedures including amputations and autopsy (Table 7.3). Most cut bones have

Table 7.3 Numbers of bones with cuts

Bone	Number	Cut	%
Cranial Bones			
Frontal	23	6	26.1
L. Parietal	23	4	17.4
R. Parietal	25	6	24.0
Occipital	21	3	14.3
L. Temporal	19	4	21.1
R. Temporal	19	3	15.8
L. Zygomatic	12	0	0.0
R. Zygomatic	10	1	10.0
L. Maxilla	14	0	0.0
R. Maxilla	12	0	0.0
Mandible	18	8	44.4
Total	**196**	**35**	**17.9**
Postcranial Bones			
L. Humerus	41	0	0.0
R. Humerus	46	1	2.2
L. Radius	30	4	13.3
R. Radius	31	1	3.2
L. Ulna	37	2	5.4
R. Ulna	33	2	6.1
L. Scapula	22	0	0.0
R. Scapula	19	1	5.3
L. Clavicle	14	1	7.1
R. Clavicle	11	0	0.0
L. Innominate	24	0	0.0
R. Innominate	20	1	5.0
Sacrum	21	1	4.8
L. Femur	35	7	20.0
R. Femur	47	6	12.8
L. Tibia	36	4	11.1
R. Tibia	50	6	12.0
L. Fibula	38	4	10.5
R. Fibula	40	3	7.5
Total	**558**	**42**	**7.5**

one or more complete transverse cuts that divide the bone into two or more pieces. Several sectioned bones have additional, small cuts consistent with saw or scalpel marks or nicks.

The frontal and right parietals were the most commonly altered cranial bones. There are five examples of complete removal of the vault cap (Fig. 7.3) and one aborted cranial dissection. The cranial sectioning shows variation in technique and experience of the dissectors. Limited surgical experience is shown in one cranium that has changing orientations of the cuts indicating the blade was repositioned at

Fig. 7.3 Autopsied calotte with a perimortem projectile injury and a circular trephination. The penetrating wound, located to the left of the adjacent trephination as viewed ectocranially, is slightly irregular (*lower left*) and internally beveled (*lower right*). The trephination perforation left a narrow lip of the inner table around the circumference of the surgical opening as a precaution to avoid damaging the dura mater (image: Smithsonian Institution)

least nine times while removing the vault cap. Cutting was higher on the posterior right vault than on the left, requiring an oblique cut 27 mm in length to connect the two sides. In another cranium with an aborted dissection, the main cut in the right parietal is higher than the corresponding cut on the left parietal by more than a centimeter. Superficial nicks present above and below the sawed edge represent false starts and areas where the blade skipped from its path. The cuts were crudely made and incomplete. Although a cranial dissection or autopsy was the apparent

Fig. 7.4 Skull (V01C) representing a male with African-American ancestry. The posterior body of the mandible was sectioned and the left ascending ramus is missing. Two saw cuts are located behind the third molar at the base of the ascending ramus (image: Smithsonian Institution)

objective, the procedure was abandoned before completion and the remains were disposed of without examining the brain.

In contrast, the autopsied calotte of a middle-aged male was evenly cut through. The cut margins of both parietals have chipped endocranial surfaces posterior to the coronal suture. A prying tool was used to separate the superior vault behind this suture. The occipital exhibits the same feature. The process suggests caution to avoid cutting completely through the bones to prevent damage to the brain. This symmetrical detachment was performed by an experienced technician or anatomist.

Cuts around the temporomandibular joints from removing the jaw were documented in one cranium. Sectioning through the zygomatic process of the temporal bone was recorded in two crania. Removing a portion of the zygomatic arch may have been done to study the temporal and masseteric region. To study the temporal region, the masseter muscle and its bone of origin are reflected downward. Several mandibles also have cuts in the ascending rami (Fig. 7.4) and mid-symphysis. Midline sectioning was done to separate the mandible into left and right sides. As noted in an examination of nineteenth-century remains from Charity Hospital in New Orleans (Owsley 1995, 127), sawed mandibles and cut bones of the face likely reflect anatomical dissection or surgical practice and training on cadavers since bones of the mid-face and jaws are typically avoided in standard autopsy practice, unless there is evidence of injury.

Fig. 7.5 Right humerus of a male represented by two pieces separated by a complete transverse cut through the distal third of the shaft. Fine striations on the cut surface indicate the blade progressed from anterior to posterior with a slightly oblique orientation. A terminal snap is present on the lateral-posterior edge of the cut (image: Smithsonian Institution)

Postcranial elements with cuts are primarily limb bones (Fig. 7.5), but also include a clavicle, right innominate (Fig. 7.6), sacrum, ribs, and vertebrae. Femora have the highest frequency of cuts (16 %), followed by tibiae, fibulae, radii, and ulnae. One adult right scapula has a metal hook in the glenoid fossa (Fig. 7.7). This is the only bone with a metal insert, the purpose of which was anatomical mounting of the right humerus.

Like cuts in the crania and mandibles, most of the postcranial sections are patterned and consistent in type and location. The cuts are nearly always complete, transverse sections through the proximal, middle, or distal diaphyses with the location of sectioning varying by element. Some sectioned long bones are represented by adjoining proximal and distal pieces (Fig. 7.8). In most cases, however, the cut bone is represented by only one of the sections. Although this could suggest amputation

Fig. 7.6 The right innominate of an older adult male with two superior to inferior cuts in the ilio-pubic ramus. The medial cut completely sectioned the ramus (image: Smithsonian Institution)

of a limb, most of the cut sections show no evidence of pathology and some exhibit cuts to both the proximal and distal ends of the bone, indicating dissection or surgical training.

Striation patterns on the cut surfaces reflect the use of straight saws in the sectioning. Surface striations, in combination with small breaks representing terminal snaps, allow directionality of the blade to be determined (Fig. 7.5). They also enable matching of radius/ulna and tibia/fibula cut bone sets. These matches are based on

Fig. 7.7 Right scapula of a male with a metal hook inserted in the glenoid fossa for anatomical attachment of a humerus. This bone was part of an articulated specimen used as a teaching aide (image: Smithsonian Institution)

consistencies in size, color, side, and anatomical placement with alignment of cuts and terminal snaps (Fig. 7.9).

Among tibiae, there was a clear preference for sectioning the proximal shaft at or just below the tibial tuberosity. This applies to the fibulae as well, with the proximal end cut in six sectioned examples. One tibia was sectioned through the distal third of its diaphysis and another was sectioned twice, once through the proximal third of the shaft and once through the distal third.

The radii and ulnae were cut through the proximal, middle, and distal shafts with no particular preference for location. A left radius and ulna set were cut twice; once through the proximal shaft and once through the distal shaft. A right radius also has been sectioned twice, with cuts through the proximal and distal shaft.

Complete cuts in 10 right and 15 left ribs are through the sternal, middle, and vertebral aspects. All of the cut ribs are from adults with the exception of one rib, which shows lack of epiphyseal union of the rib head.

Two types of sectioning are noted in vertebrae: vertical cuts through both sides of the neural arch in order to open the neural canal, and horizontal sectioning through the articular facets and vertebral body. One adult lower lumbar vertebra has evidence of the latter. Complete transverse sectioning slightly diagonal to the horizontal plane cut through the centrum, the right transverse process, and inferior articular facets. As this lumbar is tentatively associated with vertebrae showing abnormal lytic destruction, the objective may have been to remove a pathological sample. All other vertebrae with sectioning show vertical cuts through the neural arch that removed the spinous processes. This type of sectioning is

Fig. 7.8 In this matched set of bones, the right femur, tibia, and fibula were sectioned through the proximal third of the diaphysis. The left femur was cut through the proximal shaft, the distal shaft, partially through the middle diaphysis, and vertically by a longitudinal cut that joined the transverse cuts in the midshaft (*right upper* and *lower* images) (image: Smithsonian Institution)

noted in single adult thoracic and lumbar vertebrae, a set of vertebrae comprising the twelfth thoracic through the fourth lumbar, and one adolescent thoracic and lumbar vertebra.

Cuts from sectioning are more common in cranial and mandibular bones than in postcranial elements (Table 7.4) and females have nearly twice as many cranial bones and mandibles with cuts (26.9 %) as males (14.7 %). The percentages are more evenly distributed in postcranial remains with slightly more male (8.5 %) than female (6.5 %) bones having been sectioned. When examined in relation to age, young adult cranial and mandibular bones exhibit nearly three times the percentage of cuts (40.7 %) than older adult bones of the skull (14.3 %). Different results are seen for the postcranial bones, with older adults having more cuts (9.3 %) than younger adults (5.3 %) and children (5 %).

Fig. 7.9 Four cut bones of an older adult male that were matched on the basis of taphonomic observations. Both sets of bones are similar in color and preservation. The left tibia and fibula were sectioned through the proximal fourth of the diaphysis. The left forearm bones have cuts through the proximal and lower middle thirds of the shafts (image: Smithsonian Institution)

In most cases, the number and pattern of cuts and the absence of pathology on the bones indicate surgical training and dissection. However, A penetrating injury, probably caused by a low velocity projectile, is observed in one male calotte (Fig. 7.2). Two adjacent, bisecting, circular perforations are present in the posterior left parietal near lambda. The lateral hole measures 17 mm by 13 mm, and is consistent with a gunshot wound. The adjacent hole to the right measures 16.5 mm in diameter, and was produced by a trephination saw in response to the injury. The surgeon cut through the diploe, but left a small lip of the inner-table along the opening's interior margin. The trephination was likely performed while the patient was alive, presumably to remove the projectile and bone fragments, and to relieve endocranial pressure from swelling. There is no evidence of healing. The patient died and the vault was then autopsied, likely to evaluate the injury.

Perimortem injuries are evident in three additional crania; two males and one female, all older adults (35-plus years). None of the three have evidence of surgery, dissection, or autopsy. A Caucasian male has a large wooden splinter lodged in the lateral margin of the left orbit that penetrated the brain cavity. A male cranium with African ancestry shows blunt force, perimortem trauma and antemortem, healed facial and cranial vault fractures. Sharp-force trauma without healing is exhibited in a female. The severity of her head wound makes it unlikely that this injury was the cause of death. However, this woman, similar to the aforementioned males, may have been brought to the Medical College for treatment of wounds that were fatal.

Table 7.4 Distribution of cut bones by sex and by age

	Total series by sex									Total series by age								
	Male			Female			Indeterminate			Young adult			Old adult			Child		
Bone	N	N cut	%	N	N cut	%	N	N cut	%	N	N cut	%	N	N cut	%	N	N cut	%
Cranial Bones																		
Frontal	17	3	17.6	6	3	50	0	0	0	4	2	50	19	4	21.1	0	0	0
L. Parietal	17	2	11.8	6	2	33.3	0	0	0	4	2	50	19	2	10.5	0	0	0
R. Parietal	17	3	17.6	7	3	42.9	1	0	0	5	3	60	19	3	15.8	0	0	0
Occipital	16	2	12.5	5	1	20	0	0	0	3	1	33.3	18	2	11.1	0	0	0
L. Temporal	14	3	21.4	5	1	20	0	0	0	3	1	33.3	16	3	18.8	0	0	0
R. Temporal	14	2	14.3	5	1	20	0	0	0	3	0	0	16	3	18.8	0	0	0
L. Zygoma	9	0	0	3	0	0	0	0	0	1	0	0	11	0	0	0	0	0
R. Zygoma	8	0	0	2	1	50	0	0	0	0	0	0	10	1	10	0	0	0
L. Maxilla	11	0	0	3	0	0	0	0	0	1	0	0	13	0	0	0	0	0
R. Maxilla	9	0	0	3	0	0	0	0	0	1	0	0	11	0	0	0	0	0
Mandible	11	6	54.5	7	2	28.6	0	0	0	2	2	100	16	6	37.5	0	0	0
Total	**143**	**21**	**14.7**	**52**	**14**	**26.9**	**1**	**0**	**0**	**27**	**11**	**40.7**	**168**	**24**	**14.3**	**0**	**0**	**0**
Postcranial Bones																		
L. Humerus	21	0	0	20	0	0	0	0	0	12	0	0	22	0	0	7	0	0
R. Humerus	25	1	4	20	0	0	1	0	0	13	0	0	27	1	3.7	6	0	0
L. Radius	14	2	14.3	14	1	7.1	2	1	50	7	0	0	19	3	15.8	4	1	25
R. Radius	18	0	0	13	1	7.7	0	0	0	11	0	0	18	1	5.6	2	0	0
L. Ulna	15	1	6.7	22	1	4.5	0	0	0	9	0	0	25	2	8	3	1	33.3
R. Ulna	18	1	5.6	14	0	0	1	1	100	9	0	0	21	1	4.8	3	0	0
L. Scapula	10	0	0	9	0	0	3	0	0	6	0	0	13	0	0	3	0	0
R. Scapula	10	1	10	6	0	0	3	0	0	7	1	14.3	9	0	0	3	0	0
Sternum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

L. Clavicle	3	0	0	9	1	11.1	1	0	0	5	1	20	7	0	0	1	0	0
R. Clavicle	2	0	0	5	0	0	4	0	0	2	0	0	5	0	0	4	0	0
L. Innominate	12	0	0	12	0	0	0	0	0	7	0	0	13	0	0	4	0	0
R. Innominate	13	1	7.7	7	0	0	0	0	0	4	0	0	11	1	9.1	5	0	0
Sacrum	5	0	0	10	1	10	6	0	0	3	1	33.3	11	0	0	7	0	0
L. Femur	16	2	12.5	19	5	26.3	0	0	0	15	2	13.3	18	4	22.2	2	1	50
R. Femur	20	3	15	25	3	12	2	0	0	15	0	0	24	5	20.8	8	1	12.5
L. Tibia	19	3	15.8	13	1	7.7	4	0	0	12	0	0	19	4	21.1	5	0	0
R. Tibia	20	4	20	25	2	8	5	0	0	23	4	17.4	21	2	9.5	6	0	0
L. Fibula	21	3	14.3	15	1	6.7	2	0	0	12	0	0	22	4	18.2	4	0	0
R. Fibula	21	2	9.5	17	1	5.9	2	0	0	18	1	5.6	19	2	10.5	3	0	0
Total	**283**	**24**	**8.5**	**275**	**18**	**6.5**	**36**	**2**	**5.6**	**190**	**10**	**5.3**	**324**	**30**	**9.3**	**80**	**4**	**5**

Conclusion

The Medical College of Virginia has undertaken five major building projects on lots in the southeast corner of Academy Square since 1860 and each required excavation work in the square to place building foundations. No recorded discoveries of wells were made during the construction of a laboratory building, a children's hospital, or a hospital for African-Americans. However, in 1939 workers did uncover a large refuse well under the basement of the Egyptian Building during renovation of this structure. A long-serving college administrator confirmed that this well had once been used to dispose of cadavers and other anatomical specimens during the late nineteenth and early twentieth centuries. Actions taken in response to the discovery are unknown, but presumably did not include efforts to document and learn from the human remains. In contrast, this study details the composition of the bones and artifacts, documenting that the 1994 well at VCU served the early school as a convenient, expedient, and private repository for human remains, which were often illegally obtained through an established system of grave-robbing and cadaver trafficking. The discovery and analysis of the well and hidden bones provides a realistic portrayal of the basic necessities and operation of the school, and the faculty's commitment to early medical training, both of which were sometimes dependent on illicit activities. These results complement other rare discoveries of medical school and teaching hospital skeletal remains (Blakely and Harrington 1995; Harrington and Blakely 1995; Owsley 1995; see also Hodge et al., DiGuiseppe and Grant, and Seidemann and Halling, this volume).

Documentation of the individuals whose bodies were critical to this training, a majority from the African-American community of Richmond, is an integral part of this research. Analysis of the human remains indicates most of the individuals were of African descent, but not exclusively. Men, women, and children comprise the series, but a majority of the remains represent older males. An interesting comparative study of this series with other urban and rural groups is suggested by the craniometric analysis, which demonstrates heterogeneity. Some crania are more similar to continental African populations than to American Blacks, and therefore, are more likely first generation Americans not yet having experienced changes leading to the American phenotype. Phenotypic changes characterizing American Blacks apparently took place early, although the mechanisms causing these changes, whether admixture, or response to the new environment, are not well understood. Nevertheless, they allow inference that there are basically two groups represented in this series, individuals whose immediate ancestors were born in America, and individuals, probably enslaved, who were born in Africa or to parents born in Africa.

These analyses, and future studies, will expand our knowledge on the identities of these individuals whose remains poignantly reflect their significant contribution to the advancement of medical knowledge and training in the United States. When combined with the historical records and placed within the sociocultural climate of Richmond society, the remains from the VCU well represent a compelling narrative of the nineteenth-century south. As Americans continue to move toward eliminating the disparities in society, it is important to document and understand this tangible evidence of the past. In doing so, history can be made complete where written records fail to fully inform.

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Chapter 8
Structural Violence in New Orleans: Skeletal Evidence from Charity Hospital's Cemeteries, 1847–1929

Christine L. Halling and Ryan M. Seidemann

Introduction

Charity Hospital, established in New Orleans, Louisiana, in 1736, was one of the longest running public hospitals in the United States (Salvaggio 1992), finally closing its doors in 2005 following Hurricane Katrina. Initially founded with funds supplied by Jean Louis, a wealthy shipbuilder of the time who detailed in his will his desire to help the poor (Fossier 1923; Salvaggio 1992), the hospital has undergone six consecutive construction phases. Along with Louis' philanthropy, public donations and private investors funded Charity Hospital until 1811, when the hospital came under government control, though still operating to serve the indigents of New Orleans (Fossier 1923). Later in the nineteenth century, Charity Hospital would become associated with the Medical College of Louisiana and the two institutions would continue to serve the poor of New Orleans (Fossier 1923). The most recent hospital structure, built in 1937, is located in downtown New Orleans, between campuses for Tulane University Medical School and the Louisiana State University Health Sciences Center. Charity Hospital closed operations in 2005 after suffering extensive damage from Hurricane Katrina, and despite talks of renovations, new medical facilities built in the area have taken over as teaching hospitals and for the service of the City's poor.

In this chapter, we address the history of Charity Hospital with regard to it becoming a teaching institution. We also review published, and as-yet unpublished, skeletal evidence of structural violence from human remains excavated from two cemeteries associated with Charity Hospital that served as the interment site for many indigents treated at the hospital between 1847 and 1929. This examination

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provides a new perspective on the histories of Charity Hospital and indigents living in New Orleans during the nineteenth and early twentieth centuries. Recently, two samples of such skeletal remains became available for analysis. These remains, as well as information drawn from previous research (Owsley 1995), provide the basis for discussing how evidence of structural violence is visible on skeletal remains and how the violence was inflicted on individuals who were residents of New Orleans between 1847 and 1929. Combining historic information on the indigent of New Orleans during this period with skeletal evidence, we consider the death experiences of these individuals as manifestations of structural violence.

The theoretical framework of structural violence provides a lens through which to assess the unique skeletal samples that have been haphazardly recovered from these cemeteries. Farmer (2004:307) instructs us that structural violence is "violence exerted systematically—that is, indirectly—by everyone who belongs to a certain social order …." Although Farmer (2004) was speaking of structural violence visited upon living individuals in largely modern contexts, the concept of such systematic oppression, first introduced by Galtung (1969), has since been adapted as an explanation for traumatic, health, and pathological manifestations observed in the bioarchaeological record (e.g., Klaus 2012; Nystrom 2014), particularly for harsh treatment of marginal populations in medical or almshouse contexts. Such an application of the notion that certain peoples, whether because of race, poverty, or some other factor, find themselves the disproportionate subjects of harsh medical treatment either during or after life presents an interesting theoretical perspective through which to examine the skeletal remains of individuals that were once patients of New Orleans' Charity Hospital. While assessing the skeletal remains recovered from the Charity cemeteries, distinctive incisive and saw marks were documented. Although documentation of these marks provides insight into the surgical and educational practices of historic New Orleans, such evidence, when viewed through the theoretical developments of structural violence, also allows inferences to be drawn regarding the population's experiences, both in life and in death, and how those experiences were altered by their identity or economic station during life.

History of Charity Hospital

Charity Hospital became a preeminent institution for medical doctors and students to learn through the diverse patients and disease processes exhibited. By 1843, doctors were appointed to 12-month terms to oversee patient treatment at Charity Hospital. Similarly, in 1843, half a dozen students began to serve rotations at Charity Hospital during the active student season encompassing the winter months. Typically, the medical season for the schools only ran in the cooler months, as corpses would decompose too quickly in summer months (Fossier 1923).

Initial construction of the mid-nineteenth century iteration of the hospital allowed for an official patient capacity of 540 individuals. Admissions for 1847 totaled 11,690 patients, prompting the construction of a second building nearly equal in size in 1848–1849 (Fossier 1923:25–26). After this construction, Charity Hospital was one of the largest indigent hospitals in the country, able to accommodate 1000 patients at a time, rivaling the Hotel Dieu in Paris which consisted of 810 beds (Fossier 1923:26). Records indicate that, on average, anywhere from 11,000–13,000 patients were admitted per year. However, between 1850 and 1852, over 18,000 patients were admitted each year (Fossier 1923:59). Typhoid and yellow fever epidemics (Fossier 1923; Duffy 1962; Beavers et al. 1993) occurred between 1847 and 1855, causing higher death rates, during which 1800–3000 patients died each year. The highest recorded death count was 3164 in 1853. Due to advances in medical treatment and sanitation, rates for admission would scarcely reach these heights again until 1910–1922 (the last recorded amounts by Fossier 1923:59). Death rates for this later period were lower than those of the previous century with numbers between 1500 and 2200 deaths per year (Fossier 1923:59).

A separate building known as the "dead house" (the morgue for dissection) was constructed at Charity Hospital for autopsy purposes by 1843. This structure consisted of two rooms: one for storage of corpses before burial and one room for autopsy and dissection (Fossier 1923). This structure, likely constructed due to the geology of the area (basements are extremely difficult to construct and maintain in New Orleans), was well-appreciated by the anatomists and pathologists in residence. As noted in a medical journal, the "dead house" was "well lighted, well ventilated, a hydrant of clear gushing water, and plenty of fresh subjects – what more could be desired" (Fossier 1923:25). During a period of rebuilding in the early 1880s, a new "dead house" was constructed—a two-story building with the first floor being a visitation center for the deceased who were claimed, while the upstairs contained two rooms for autopsy and dissection of corpses (Fossier 1923:40).

Premortem and Postmortem Experiences of Nineteenth and Early Twentieth Century Indigents in New Orleans

Inimitable to Charity Hospital is its establishment as a public hospital from its conception. Additionally, the history of Louisiana and its composition of citizens from myriad backgrounds and social statuses resulted in a highly varied, stratified society. Indigents at this time in Louisiana also included a diverse population, particularly for the time in which the Charity Hospital Cemeteries were in use. African-Americans, Caucasians, immigrants, and soldiers all are documented to have been patients at Charity Hospital.

Many examples of structural violence and the associated attitudes and treatment of African-Americans exist from the northeast United States (Nystrom 2011, 2014; Humphrey 1973; Elia and Wesolowsky 1991). Sharpe (1997) describes the complex societal structure of slaves in the south, the class stratification that was perpetuated in this subset of indigent experiences. For the antebellum south, the free black persons who were skilled tradesmen were in the best position to make the transition to emancipation (Sharpe 1997). These individuals were also the most likely to take advantage of the services offered at Charity Hospital, as slaves were frequently treated at home or on the plantations (Duffy 1962). Necessarily, the experiences of the enslaved on plantations versus those in urban areas would be significantly different. Bell's (1997) work on the Afro-Creole experience of Louisiana, however, most clearly defines the social order of the time. In opposition to the strict divisions of class seen in other parts of the United States, New Orleans was truly a three-class system in the early decades of the nineteenth century. "In creole New Orleans, an intermediate class of free people of color had gained a measure of social acceptance" (Bell 1997:65). These individuals were also identified in the hospital register, the letters F.P.C. following their names (Duffy 1962; Beavers et al. 1993). It is important to note that, for all of the academic commentary available on slaves and former slaves in the south, these people were not the exclusive patients at Charity Hospital. Indeed, the hospital also tended to the needs of the poor Caucasian and immigrant communities.

Savitt (1982) notes that while there are numerous examples of medical experimentation and the use of cadavers of enslaved and free African Americans for dissection, the bodies of indigent Caucasians were also used in this manner. In the United States, people "did not strenuously object to the dissection of the poor, African-Americans or immigrants" (Halperin 2007:491). The first recorded autopsy at Charity Hospital was in 1821 (Salvaggio 1992), with ten more just a year later. Following the initial practice of autopsy in 1821, Duffy (1958:442) states that "within fifteen years the first medical school was opened in Louisiana and autopsies soon became a common practice at the hospital." By 1859, it was observed that at least 150 corpses would be dissected in one medical season (Fossier 1923). Records from Charity Hospital support the likelihood that all indigents, regardless of race, were potentially used for medical autopsy or dissection. Humphrey (1973) reinforces this attitude of singling out marginalized populations, particularly indigent Caucasians and poor immigrants in the northeast United States.

Seemingly then, by the 1850s dissection was such a common practice that professors and students would expect to not only have access to nearly any patient that died, but would be able to choose those cases they wished to study. Indeed, firsthand accounts of the treatment of corpses belie the cavalier attitude towards such access and also reveal insensitivities towards the treatment of the bodies:

> As we walked through the dismal charnel-house, nervously clutching the arm of our accomplished cicerone, Dr. _______, of the University of Louisiana, imagine our horror to see him sieze [sic] an idle brush, and, with artistic twirl, slap a cross-mark upon the bare breast of a lately expired wretch, examining [sic] with the gusto of a connoisseur in dead flesh, "This is mine!" (Fossier 1923:31)

Further recounted are the surgical procedures conducted in the amphitheater at the time. Crowds of students (50–100 persons) would attend on regularly scheduled nights to observe some "important" surgical procedures, described as a spectacle due to the patient being fully awake during the procedure (Fossier 1923:31):

> The trembling expectancy of the terrified subject; the nervous pallor of the medical tyros, who are about to see a man's leg or arm whipped off for the first time; the careless nonchalance of the hospital habitues; the giant form of the veteran man of the knife, Dr. Stone, as, with cuffs

> thrown back, eye all ablaze, and lips firmly clinched, he prepares to make the adroit thrust; the quick prefatory whirl of the well-grasped blade; the sudden flash of the polished steel; the dull, muffled sound of the yielding flesh, the spirt of the blood, the scrape of the keen edge upon the solid bone, the sharp cry of the patient, followed by the heavy moan of pain – these are the outline of a picture that thrills and terrifies the uninitiated beholder.

Many volumes have been written on the history of medical practices in Louisiana (e.g., Duffy 1958, 1962; Bankole 1998), as well as specific treatment of patients at Charity Hospital (Fossier 1923; Salvaggio 1992). These perspectives provide particular insight into the types and breadth of surgical and autopsy techniques that were performed at the hospital throughout the nineteenth and twentieth centuries.

Attitudes surrounding surgery on and dissection of indigents at the time were highly inconsiderate towards concerns of the patients or their families. Duffy (1958) notes that students in 1851 were required to purchase at least one arm and two legs for dissection. Undoubtedly, their body parts, once removed, purchased, and studied for educational purposes, would be discarded, likely without being reassociated with the original owner.

It was also clearly valuable that there was an exceptional array of patients in New Orleans at the time who provided students and surgeons with a broad range of diseases and pathologies. From the same interview republished in Fossier (1923:30), the writer describes the diversity and the advantages to study at Charity Hospital.

> Here are the sick wards, constantly crowded with patients of every age and sex, of every color … here you will find every type of disease and every gradation of bodily injury, from the simple cold to the malignant vomito, and from the spraining of a finger to the compound comminuted fracture of the thigh-bone. Not less than four hundred diseases are mustered in their catalogue.

Bankole (1998:100) discusses the treatment of African-Americans in the antebellum south and specifically references Charity Hospital, noting that the facility was considered a leader in medical experimentation in surgical procedures, with most reports indicating that surgical techniques were performed on the African-Americans cadavers. Savitt (1982) echoes this treatment of African-Americans, particularly in the antebellum period in living patients, with doctors testing new procedures on African-Americans, who were praised for their ability to withstand pain that Caucasian patients could not tolerate. Bankole (1998:102) also notes the terms "Needle Men" and "Black Bottle Men" in New Orleans, which were terms used in the African-American community at the time for the Charity Hospital medical students who would hasten death in order to provide corpses for dissection. These rumors, perpetuated in the antebellum period, continued to persist in African-American descendent mythology. However tempting it would be to dismiss these rumors based on the amounts of potential corpses Charity Hospital had access to, it is more possible than not that this phenomenon did occur. This same lore fits precisely into what Halperin (2007) described as rumors surrounding body snatching, conveyed to slaves in the antebellum period, and the indigent free African-Americans later. While body snatching (which has been detailed elsewhere—Richardson 2000 and Shultz 2005) did occur, Halperin (2007) notes that southern Caucasians would continue to circulate rumors about medical students and resurrection men. Anecdotes were surely shared from neighboring states, which have specific tales of men like Grandison Harris (Sharpe 1997), the resurrection man of the Medical College of Georgia, where the disposal of bodies was discovered in the basement of the dissection room (Blakely 1997). Halperin (2007) notes that the Grafenberg Medical Institute in Alabama "obtained cadavers by grave robbing, from the occasional execution of a criminal, and by importation from Montgomery or New Orleans of bodies shipped in molasses barrels." Duffy (1958:443) specifically states that, in opposition to other states, "in New Orleans no such problem existed; in fact, the supply exceeded the demand in most years and anatomy and dissection were never hindered by a lack of specimens." Undoubtedly, the rumors about men "hastening death" at Charity Hospital occurred, perpetuating rumors; however, a lack of public outcry against grave robbing in New Orleans suggests that the resurrection experience there differed from experiences in other cities and states.

The Charity Hospital Cemeteries

The cemeteries from which the remains reviewed here were derived were contemporaneous with the hospital construction phases that began in 1833; they are known as Charity Hospital Cemetery #1 ("Charity #1"; 16OR175) and Charity Hospital Cemetery #2 ("Charity #2"; 16OR108) (Fig. 8.1). Charity #1 was established in 1847 and initially was used as a potter's field. Therefore, general interments of unclaimed bodies of New Orleans occurred in Charity #1 and the cemetery was not used exclusively by Charity Hospital until well into the 1900s (Salvaggio 1992:50). Charity #2, the cemetery from which the remains analyzed by Owsley (1995) were derived, was in use between 1849 and 1929. Although Charity #2 was contemporaneous with Charity #1, if was effectively a secondary inhumation lot used when Charity #1 was unusable due to standing water (Shenkel et al. 2007:43; Beavers et al. 1993:78). Huber et al. (1974) indicate that Charity #2 was used exclusively as an indigent cemetery, portions of which were in use until at least 1920.

Records of Charity Hospital from 1832 to 1922 show that, of 824,600 admissions, 112,635 individuals died during the period that both Charity Hospital cemeteries were used for interments (Fossier 1923:59). Shenkel et al. (2007) used ground penetrating radar at Charity #1 to test for the location of graves and the extent of burials present. Targeted excavation units revealed the presence of burials up to two meters below the ground surface, multiple interment layers atop one another [likely due to the addition of soil from the 1937 reconstruction of Charity Hospital (Huber et al. 1974)], and burials as shallow as 30 cm below ground. Additionally, investigations at Charity #1 suggest that interments were not exclusively coffin burials but consisted of either intrusive or multiple bodies in a single interment (Shenkel et al. 2007). Shenkel et al. (2007) estimate a conservative number of 2127 burials at Charity #1, but, due to multiple layers, that number could be expanded to over 4250 (or more) burials present. Historical documents reported by Shenkel et al. (2007)

Fig. 8.1 Excerpt of a US Geological Survey quadrangle map of New Orleans, showing the locations of the Charity Hospital Cemeteries. The letter "A" indicates the location of 16OR175 (#1) and the letter "B" shows the location for 16OR108 (#2)

indicate that Charity #1 has a racial dividing line, whereby Caucasians were buried towards Canal Street (east) and African-Americans towards Banks Street (west). There are no extant burial records detailing specifically where individuals are buried. It seems likely that, despite the appearance of racially separate interments, burial likely occurred where space was available.

In 1985, expansion and resurfacing of Canal Boulevard led to the disinterment of human remains at the location of Charity #2. Archaeological excavations necessitated by this construction at Charity #2 revealed hundreds of individuals, many representing cases of commingling. There is no indication that Charity #2 had any segregation as at Charity #1, and, in light of the ancestral markers noted by Owsley (1995), it would appear that both Caucasians and African-Americans were buried indiscriminately. However, similar to Charity #1, there are no extant burial records detailing specifically where individuals are buried.

Interments at both Charity #1 and Charity #2 consist of burials with and without coffins, as well as isolated limbs that were disposed of following surgical procedures. As noted previously, students reportedly purchased limbs of cadavers for educational courses, therefore it is not surprising that isolated limbs or bones would be commingled with interments or interred in separate burials.

Skeletal Remains Recovered from Charity Hospital Cemeteries

The Charity Hospital cemeteries have been disturbed numerous times over the years (Owsley et al. 1990; Beavers et al. 1993; Owsley 1995; Heitger 2006; Shenkel et al. 2007; Seidemann 2008a, b, 2011; Godzinski et al 2008; Smith and Stone 2014). Each of these disturbances has provided an opportunity to examine the bioarchaeology of those interred in these spaces.

The first, and largest, sample of human remains associated with Charity Hospital was recovered during a 1985 expansion and resurfacing of Canal Boulevard that impacted Charity #2. A total of 140 graves were encountered, resulting in a total recovery of 271 individuals (Owsley et al. 1990; Beavers et al. 1993; Owsley 1995). In his analysis of this skeletal material, Owsley (1995) focused on how the placement of cut and saw marks could provide insight into the surgical practices and techniques in nineteenth and twentieth century New Orleans. While this collection has been reinterred, we have included information available from Owsley's (1995) research and have reorganized the relevant information in the context of a theoretical perspective inclusive of skeletal indicators providing supportive evidence of structural violence.

The second sample, curated at the University of New Orleans (UNO), has no associated report on its recovery and there is little contextual information beyond that they were recovered during roadwork on Canal Boulevard and that they are associated with Charity #2. It is also clear that these remains are not the same as those analyzed by Owsley (1995). Seven boxes of commingled and fragmentary human remains were analyzed by the authors. Approximately 938 analyzable bones are present for analysis and the minimum number of individuals (MNI) is 55 (represented by left femora). The bones can be generally classified as being in a poor state of preservation. Taphonomic processes caused the cortical bone to be very fragile, frequently flaking off during handling. Due to a lack of contextual information, there has been no attempt to reconstruct discrete individuals, and for the purposes of this chapter only the bones specifically showing marks from surgery, autopsy, dissection, and experimentation are subjected to any further demographic contextualization. The UNO sample is therefore diametrically opposite from the sample analyzed by Owsley (1995) in which discrete individuals were recovered from graves and full biological profiles could be constructed.

The final sample of human remains known to have been removed from these cemeteries is also commingled and consists of isolated bones that were recovered during the construction of the Hurricane Katrina Memorial on the grounds of Charity #1 (Seidemann 2008a, b, 2011). In the wake of Hurricane Katrina, the Katrina Memorial Corporation constructed a memorial on the site of Charity #1. The memorial consists of several aboveground mausoleums that house the remains of those left unidentified following Hurricane Katrina in 2005. Although the memorial is entirely aboveground, ground stripping had to be done at the site to ensure the structural stability of the memorial and posthole excavation was accomplished to accommodate a new fence. Excavation and monitoring of the ground stripping was accomplished by Earth Search, Inc., of New Orleans. A full skeletal analysis from the construction of the Katrina Memorial excavations was completed by Seidemann (2008a, 2011). Ground stripping resulted in 43 bone fragments and an MNI of 3, while 16 of the excavated postholes contained human bone, including 444 skeletal elements, for an MNI of 21. As these two skeletal samples (the Charity #2 remains from UNO and the Charity #1 remains from the Katrina Memorial) are temporally similar, derive from the same source (Charity Hospital), and are likely comprised of individuals from the same period and similar economic status, they will be detailed as case studies with contextual support drawn from the analysis conducted by Owsley (1995).

These three samples of skeletal remains that form the basis for the current discussion represent a cross section of the marginalized populations of Louisiana. Each sample contains numerous examples of stress and trauma exhibited on the skeletal remains. Observations of the placement and location of associated pathologies, sharp force cut marks, and saw marks provide an indication of sustained injuries.

Skeletal Evidence of Postmortem Examination

In his 1995 analysis of the skeletal material from Charity #2, Owsley differentiated among the following procedures that would potentially have left cut or saw marks on the bones: surgical procedures, autopsies, amputation, and surgical experimentation. Adapting those categories to the skeletal material analyzed recently resulted in similar categories. In opposition to identifying specific examples of amputation, we found examples of dissection were more useful in this assessment. We used Owsley's (1995) categories as indicators of potential premortem and postmortem procedures, and, based on the location of observed cut marks, examined relationships between these marks and the premortem and postmortem experiences of individuals from Charity Hospital.

The first category of premortem and postmortem skeletal alteration is the application of surgical techniques. Included within this category are cuts in areas highly affected by disease processes or inflicted trauma. These cuts are likely to be placed in areas similar to those in the process of dissection, discussed below. Postmortem autopsies are the second category. Marks on the bone associated with autopsies are saw cuts around the cranium and along the anterior ribs, with occasional involvement of the clavicles or sternum (Fowler and Powers 2012:194). The third category of postmortem examination, dissection, leaves indicators that could overlap with all categories of procedures. Some distinctions however include cut or saw marks that are located at specific muscle origin/insertion areas, along with removal of the calotte and ribs. Fowler and Powers (2012:176) note that dissection practices in London included transverse cuts on the long bones, particularly around the elbow and knee. Additionally, they note a particular preference of dissecting the mandibular ramus and specific cranial structures (the fourth ventricle and middle ear).

Specific dissection techniques, however, also vary based upon the personal preference of the surgeon performing them. Therefore, it would be likely that variations in the placement of saw marks and cuts have much to do with how the medical practitioner learned dissection techniques rather than a representation of a standard protocol. Finally, the last category is experimentation, which incorporates cuts that are not standard for dissection. Experimentation cuts would likely occur through the desire to open areas of the body that are not likely encountered in a standard gross anatomy class. For instance, multiple cuts on a single bone, such as the mandible at different angles (in all likelihood to observe the teeth or trace the nerves and vessels that supply that area) or at multiple levels of a long bone (indicated by saw marks on both ends of a long bone fragment in close succession) may be an indication of experimentation. Cuts that are not used in surgical techniques, for example sawing through a long bone in the sagittal or coronal plane, instead of transversely (which would likely be for an amputation or dissection) may also be an indication of experimentation.

While the four types of inflicted cuts are applied at different locations, they may also have different implications to society. Performing autopsies, as they seek to provide the family and/or law enforcement with answers about death, may convey less sinister connotations to the public than dissection or experimentation [c.f., Savitt (1982:337)]. However, depending on the locale, the public perception of both dissection and experimentation was ingrained with an aspect of punishment (Humphrey 1973; Halperin 2007; Hildebrandt 2008).

Combining the three collections of human remains from the Charity Hospital cemeteries, many examples of surgical procedures, autopsy, dissection, and experimentation practices are present. The addition of 79 individuals (from UNO and the Katrina Memorial) to Owsley's original sample of 271 results in a collective of 350 individuals, likely all patients that were at Charity Hospital during the nineteenth and early twentieth centuries. The sample discussed by Owsley's (1995) original investigation of Charity #2 included 113 postcranial bones and 233 cranial bones with saw marks (346 total). The UNO sample from Charity #2 includes 46 bones with saw or cut marks. Finally, the Charity #1 remains include 10 bones exhibiting saw or cut marks (Seidemann 2008a, 2011). Select examples are detailed in the following sections to highlight the variety of interpretations from the skeletal material in the three samples of human remains from Charity Hospital.

Skeletal Examples of Surgical Procedures

Amputations are the most common form of surgical procedure observed in all three samples, some clearly associated with pathological conditions. Many examples of amputation come from Charity #2, analyzed by Owsley (1995:135), in which he identified clear examples of trauma and gunshot wounds that necessitated the removal of lower limbs in both cases. Also identified is evidence of a double femoral amputation just above the midshaft bilaterally (Owsley 1995:143), which may have been removed due to some trauma, however there are no markers to indicate what condition afflicted this particular individual.

Fig. 8.2 Right tibia shaft with amputation and pathology from the UNO material recovered from Charity #2. The *arrow* indicates the proximal cut end of the shaft

Only a single example of amputation, an isolated right tibia, was observed in the UNO collection (Fig. 8.2). The tibia fragment consists of the diaphysis and the saw cuts are positioned on the proximal third of the bone shaft. This bone also has a pathological condition, possibly osteomyelitis, suggesting that there was some infectious process occurring that was the impetus for removal.

From the Charity #1 sample, there is an isolated midshaft of an unsided tibia, measuring approximately 3 cm in length that is the result of two transverse cuts through the diaphysis. There are two potential interpretations: either two successive amputations were performed on the individual (with little time between the surgeries as there is no evidence of bony remodeling) or this bone fragment provides evidence of possible experimentation during dissection. Similarly, saw marks on a distal right femur fragment and tibia fragment, also in the collection from Charity #1, are in likely locations used during amputation.

Skeletal Examples of Autopsy

The Charity #2 sample analyzed by Owsley (1995) showed an interesting trend with regard to the pattern of individuals that were autopsied. Owsley (1995:134) notes that there was a greater proportion of older individuals undergoing autopsy than what would be expected in modern times. However, individuals of all ages and sexes were subjected to autopsy, therefore leading to two potential explanations: that either all individuals who died of natural causes or homicides underwent autopsy, or that these bodies were used "for the purposes of instruction, demonstration and experimentation" (Owsley 1995:134).

Examples of autopsy (and possibly dissection) in the UNO sample consist of calottes and cranial fragments with saw marks located at areas that are consistent with removal of the brain (Fig. 8.3). Several of these examples also include hesitation, or "start marks," where the saw slipped or skipped, making visible a cross section of the saw. The presence of start marks indicate that these individuals may

Fig. 8.3 Example of autopsy related calotte removal from the UNO material from Charity #2. This specimen also shows evidence of hesitation or “start marks” near the actual autopsy cut. The *horizontal arrow* in the image indicates a “start mark” and the *vertical arrows* indicate additional cut marks that may represent defleshing activity

Fig. 8.4 Autopsy cuts on the sternal ends of a pair of first ribs from Charity #1

have been used for practice for educational purposes, as students learned how to perform techniques of autopsy or dissection for the first time.

The skeletal material from Charity #1 contained several examples of cranial removal consistent with autopsy or dissection. In particular, four frontal bones from this sample have saw marks positioned for cranial removal. Additionally two first ribs (Fig. 8.4) contain surgical cuts on the sternal ends of the bone consistent with the removal of the breast plate in autopsy procedures. The fragments from isolated individuals provide little demographic information to contribute further to the understanding of autopsy procedures; however, they do support the general procedures performed on individuals at this time.

Skeletal Examples of Dissection

Distinguishing between the intentions of saw or cut marks on bones is particularly difficult when dealing with isolated bone fragments (Walker 2001 notes the difficulty of divining the source of such insults in general). In the case of the Charity #2 skeletal remains analyzed by Owsley (1995), it was possible to make some clear distinctions between types of saw marks on individuals. Cases of surgical procedures (presented above) and experimentation (presented below) were perhaps a bit clearer than the subtleties needed to distinguish between autopsy and dissection. However, as Owsley notes (1995:130) when a pattern of saw marks emerged, "located in the middle third of the diaphysis…the pattern of cuts was often inconsistent with routine autopsy protocol." As there is little need in a standard autopsy to cut bones in the middle of the shaft, it seems that bones with this pattern are likely due to the cause of an alternate scenario: dissection, surgical procedure, or experimentation.

From the sample of UNO (Charity #2) skeletal material, several long bones and a few axial elements exhibit incision marks. In these examples, the incision marks are all consistently placed at the location of muscle attachment sites. One cranial fragment (a left parietal) has an incision located superior to the temporal line progressing from anterior to posterior, potentially consistent with the removal of muscle and skin in that area. Additionally, a manubrium fragment also exhibits probable incision marks on the anterior surface, consistent again with tissue removal.

There are few examples of dissection from Charity #1, one of which was observed on a fragment of a right subadult (5–10 years old) proximal humerus. The placement of the incision marks is consistent with dissection and anatomy instruction (Fig. 8.5) (see e.g., Box 1910; Romanes 1986) or defleshing (Olsen and Shipman 1994). This example of such activity on a subadult seems to be an anomaly, however, as, in the sample from Charity #2 analyzed by Owsley (1995), only six individuals under the age of ten were recovered, none of which showed evidence of postmortem dissection. Three explanations for this discrepancy include: that subadults were treated differently and rarely dissected; their interment was confined to specific locations within the cemeteries that have been largely undisturbed by excavations; or the remains are too fragile to survive the taphonomic processes in any manner such that dissection can be discernible on the bones. Additionally, three rib fragments (Fig. 8.6) were recovered with perimortem cut marks present on both the external and internal surfaces. It is likely these fragments were affected during tissue removal.

Fig. 8.5 Right subadult humerus with incision cut marks (indicated at the *arrow*) consistent with dissection from Charity #1

Skeletal Examples of Experimentation

Experimentation marks are the most unique to any skeletal sample when assessing the variety of saw or cut marks present in the skeletal samples. Experimentation may take place due to curiosity on behalf of the student or medical doctor, as practice for using surgical instruments or techniques, or perhaps even carelessness on behalf of the practitioner. In the collection of burials from Charity #2, cuts on mandibles were prevalent and unique. Owsley notes (1995:127) the presence of 26 sawed mandibles, "likely that these bones were either cut for surgical practice on cadavers (i.e., osteotomy for removal of tumours of the jaws), anatomical dissection or other medical experimentation." Owsley (1995:142) also documented an example of a maxilla on which the anterior dentition was transversely removed at the alveolar margin. Experimentation was not confined to the dentition, as several bones, including a lumbar vertebra, clavicle, manubrium, and talus, were recovered with saw marks at various angles that are inconsistent with any standard autopsy protocol (see e.g., Delafield 1879; Hektoen 1894; Weber et al. 1973). A left arm was also cut at multiple locations, the radius and ulna with two cuts each, just proximal to the elbow, and a second set through the midshaft of each bone, plus the humerus was cut just above the elbow (Owsley 1995:144).

The UNO (Charity #2) sample contains a mandible bisected between the first and second molars. The unusual location of the cut is not consistent with surgery and suggests that it is the result of experimentation (Fig. 8.7). Similar to the cut mandibles reported by Owsley (1995) from Charity #2, it appears that this fragment was

Fig. 8.6 Three rib fragments from Charity #1 with *arrows* indicating perimortem cut marks consistent with defleshing

Fig. 8.7 Experimentation on mandible from Charity #2, saw marks between the first and second molars

sawed for practice or curiosity. The material from Charity #1 did not contain fragments that clearly exhibited the results of experimentation, except for the tibia fragment described above.

Structural Violence and Charity Hospital

Although much of the literature on this topic examines the structural inequalities experienced by African Americans in the United States (Humphrey 1973; Savitt 1982; Davidson 2007), the New Orleans' Charity Hospital cemeteries represent, at least with regard to the samples examined here and based on historical sources, a collection suggestive more of a racial egalitarianism than other samples. Based on the historic sources noted above, it is probable that the violence visible on the human remains from Charity #1 were visited upon Caucasians (Shenkel et al. 2007), while the violence exhibited on the Charity #2 material, based upon Owsley's (1995) analyses, were visited upon both Caucasians and African-Americans. Instead of ancestry, the unifying characteristic of the groups represented by the skeletal material recovered from the Charity Hospital cemeteries seems to have been poverty. This distinction with other studies deriving from hospital contexts (e.g., Humphrey 1973; Savitt 1982; Davidson 2007) is not surprising considering the location. Although New Orleans did not avoid the mid-twentieth century ugliness of racial tension and segregation (Fairclough 1999), in its earlier years (i.e., the time when the subject population was alive), under a more continental perspective, the color line was not always as important in New Orleans as elsewhere in the south.

When introducing the theory of structural violence, Galtung (1969) examined the impacts of institutional activities on living individuals. Although the theory found some purchase within the medical and historical communities over the years (e.g., Savitt 1982; Farmer 2004; Farmer et al. 2006), its use in bioarchaeological theory as a lens through which to interpret certain skeletal evidence of life experiences is of recent vintage. Indeed, the adaptation of the interpretive concept of structural violence to bioarchaeology by Klaus (2012) is still not quite a perfect theoretical fit for the Charity Hospital cemetery scenario. As Klaus (2012) applies the concept of structural violence to historic Peruvians, he is examining the impacts of the institutional treatment of individuals during life and how that treatment is manifested in the skeletal record. Charity Hospital presents a variation on this theme, as, while the violence visited upon the former patients of Charity Hospital in New Orleans was certainly structural in that the treatment of the poor was a result of "mechanisms… within the political and economic constructions of a social world" (Klaus 2012:31), it is not always violence experienced during life that is exhibited by these remains (see also Nystrom 2014). In this regard, the Charity Hospital remains examined here represent yet another extension of the concept of structural violence—the inflicting of that violence after death.

However, the abundance of defleshing (dissection) marks on the Charity remains goes a step further than even the concepts of structural violence discussed by Klaus (2012) for historic populations' experiences during life. The people who were the subject of this sort of violence, unlike those described by Farmer (2004), were already dead. As Nystrom (2014:765) recently noted, "[c]onceptualizing dissection as a manifestation of structural violence extends the concept to encapsulate postmortem manifestations of social inequality." This notion is consistent with the skeletal evidence available from the Charity Hospital cemeteries. As has been amply demonstrated by Richardson (2000) and Shultz (2005), this sort of postmortem violence was perhaps equally sinister to that experienced by living people, as it erased the memory of its subjects after death. Rather than burial and commemoration, those on the economic fringes of society in the nineteenth and early twentieth centuries often fell victim to body snatching, and sometimes were used as the direct supply of their bodies to teaching institutions (as with Charity). In a criminal context, this misappropriation would be considered desecration of bodies in the name of education and science (Halperin 2007:489; Hildebrandt 2008:6). In this regard, the Charity Hospital samples reviewed here are completely consistent with the postmortem structural violence documented elsewhere in the United States. However, to take Nystrom's (2014) concept of postmortem structural violence a step further, such investigations cannot end simply by examining the treatment of human remains after death, but they must also extend to the ultimate disposition and commemoration of the individual. In many cases of postmortem education and experimentation with human bodies in the past, those whose bodies were used, were not only abused in a physical sense but also in a metaphysical sense through the erasure of their identity in death (Halperin 2007:489; see also Hodge et al., Chap. 6). The erasure of identity is exemplified in the Charity Hospital cemeteries through the loss of any personal identifying information of those interred and through the seemingly indiscriminant disposal of people and their parts as simple medical waste. This ultimate depersonification is the apex of postmortem structural violence. It is as though the person never existed at all.

Conclusion

New Orleans was not unique in its treatment of the poor as research and teaching subjects in the nineteenth and early twentieth centuries. In fact, the skeletal evidence from the Charity Hospital cemeteries aligns with that found at burial sites for other marginal members of society around the world (e.g., Fowler and Powers 2012; Nystrom 2014). The recent analyses of excavated remains from these cemeteries have minimally provided some voice to these forgotten people through an interpretation of their sufferings in life. Further, even the medical education community in New Orleans has made an effort to commemorate these unknown individuals through the erection of a memorial to their memory on the Charity #1 site (Fig. 8.8). Nonetheless, arguably, the continued use of the Charity #2 site as a road and the

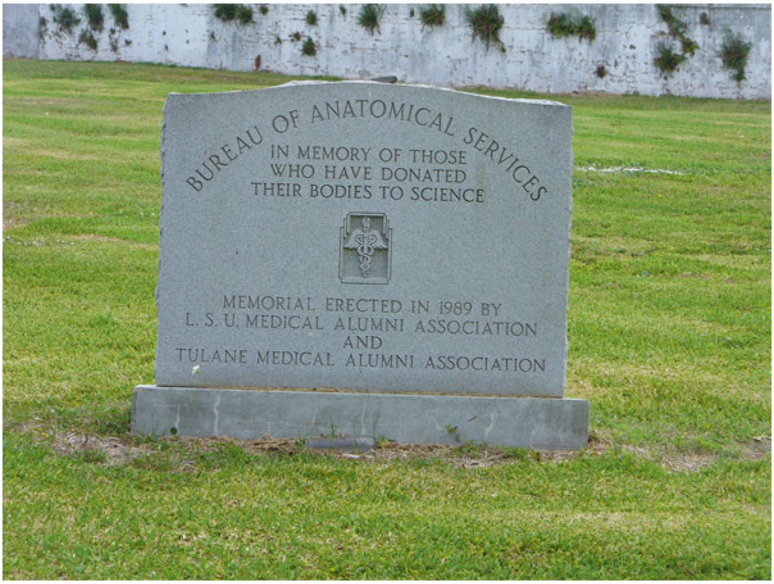

Fig. 8.8 Commemorative marker to the individuals used for dissection at Charity #1, erected in 1989

conversion of part of the Charity #1 site to a memorial for Hurricane Katrina victims represents yet a further act of postmortem structural violence to the Charity Hospital dead, as both activities further diminish and marginalize their memories.

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Chapter 9
Dissection and Documented Skeletal Collections: Embodiments of Legalized Inequality

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Introduction

Within the US, curated osteological collections have been used to develop methodologies and theories associated with the interpretation of skeletal remains, including studies of human variation, health and disease, growth and development, and forensic identification (Hunt and Albanese 2005; Tobias 1991; Usher 2002). The collections' associated documentation provides a vital biohistorical record, and the physical condition of the skeletons is often more complete and better preserved than among archaeological human remains. The four collections discussed in this chapter—the George S. Huntington Anatomical Collection, the Robert J. Terry Anatomical Collection, the Hamann–Todd Osteological Collection, and the W. Montague Cobb Human Skeletal Collection—represent the most well-known and frequently used anatomical skeletal teaching collections in the US. Many medical schools, including those detailed throughout this volume, eventually interred, reinterred, or discarded their dissection cadavers. The collections described in this

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chapter comprise skeletons that were curated by anatomists and continue to be used in research today.

The use of these skeletal collections in education and research has advanced many fields related to anatomy and anthropology. However, the socially sanctioned use of unclaimed cadavers in their development has resulted in the overrepresentation of the most impoverished segments of society. This chapter details anatomical legislation and the history of cadaver procurement for the purposes of medical, anatomical, and anthropological education within the UK and the US. Special consideration is given to the historical context and the relationships among the collectors of US osteological assemblages. A thorough understanding of the circumstances under which these human remains were acquired poses unique questions and opportunities for researchers. Knowledge of the structural violence that led to the inclusion of particular individuals within the collections requires current anthropologists to critically reflect upon the power dynamics and impacts of their research.

History of Cadaver Procurement

American anatomical legislation and medical education has its origins in Europe, specifically Great Britain. Most of the nation's early anatomists and physicians, such as Benjamin Rush, William Shippen, Jr., and Caspar Wistar, were trained in Scotland and England, bringing their knowledge and belief systems about dissection and the dead across the Atlantic. Anatomical laws related to dissection span over 700 years in Europe and are often intertwined with societal views on executed criminals, the poor, and other "deviants." The earliest anatomically related legislation allowing the dissection of executed criminals in Great Britain was enacted in 1506 by James IV of Scotland, who annually allotted one individual to the Edinburgh Guild of Surgeons and Barbers (Richardson 1987). This practice persisted with modifications in the allotted number until 1726, when George II indicated that all bodies of executed criminals were to be given to anatomists (Ball 1928). The practice of legally obtaining corpses from the scaffold or gibbet continued into the eighteenth century as a result of The Bloody Codes. These included the 1752 passage by British Parliament of the Murder Act, which served to humiliate murderers by desecrating their remains via anatomization and public dissection (Richardson 1987). Thus dissection became intimately linked to capital punishment (Hildebrandt 2008; Richardson 1987; Sappol 2002).

Despite this legislation, demand for cadavers exceeded the supply in Great Britain. Many physicians resorted to grave-robbing or enlisted the services of resurrectionists. This meant disturbing the remains of the recently buried dead in public, hospital, and private burial grounds. Those in power turned a blind eye to the fact that mostly potter's graves were targeted. However, in 1829, selling bodies for anatomical profit crossed the line to murder with William Burke and William Hare, who killed 16 people in Scotland and sold their bodies to University of Edinburgh anatomy professor Robert Knox. As a result, public outrage towards anatomists, and especially resurrectionists, escalated until the British Parliament passed the Warburton Anatomy Act in 1832, stipulating that all unclaimed bodies would be provided for medical education (Richardson 1987). Unclaimed became synonymous with the poor, the mentally and physically ill, and the socially marginalized.

These attitudes toward the dead, including grave-robbing and social distancing, made their way to the US. The use of unclaimed bodies for dissection became the norm in American anatomical laws until the 1968 passage of the Uniform Anatomical Gift Act (UAGA). Prior to anatomical legislation, paupers' graves and potter's fields, the traditional burial places for indigent, unclaimed, or unknown individuals were considered legitimate sources for anatomical specimens (Humphrey 1973; Shultz 1992). Scientific authorities dictated the acceptability of resurrectionist activities and the dissection of executed criminals. However, such behaviors remained surreptitious as they were feared and abhorred by those outside of the medical community. In many instances, the disdain for resurrectionist activities culminated in anatomy riots in major cities throughout the US (Sappol 2002).

In 1831, Massachusetts passed the first American anatomical law legalizing the transfer of unclaimed bodies directly to medical schools for dissection (Sappol 2002). New York followed in 1854 with the Act to Promote Medical Science and Protect Burial Grounds (commonly known as the Bone Bill). The Act stated that qualifying New York colleges would "… receive the remains or body of any deceased person, for the purposes of medical and surgical study; provided that said remains shall not have been regularly interred, and shall not have been desired for interment, by any relative or friend of said deceased person, within twenty-four hours after death" (Laws of the State of New York 1854:282). Additional state anatomy laws would similarly support the use of unclaimed decedents for medical purposes, including those in Missouri (1879), Ohio (1881), and the District of Columbia (1895).

Anatomical legislation targeted select segments of the population; the poor and marginalized who already, unofficially, comprised the bulk of the cadavers in use. Humphrey (1973:824) writes that legalization, "…did not substantially alter the social origins of the supply. It simply assured that cadavers would come entirely – rather than primarily – from America's lowest social strata." Cadaver dissection, subsequent collection, and museum display were firmly secured within a politically and economically sanctioned structure which harmed the poor, but now the transactions took place with transparency, eliminating much of the cemetery theft that was considered a black mark against the medical community. Contrary to repeated claims by lawmakers that the use of unclaimed bodies would not cause anyone heartache or distress, first-person accounts illuminate the pain and helplessness of grieving relatives who lacked the funds or power to retrieve their deceased loved ones. During a 1914 investigation of the New York City Coroner's office, physician Dr. Lehane testified on his work at Bellevue and Harlem hospitals, "I have met in the ante room of these two institutions hundreds of weeping relatives, powerless to save their dead kinsfolk from the dissecting table" (The Evening World, November 19, 1914). These were individuals who were caught in a system of structural violence that targeted the poor to provide training material for the medical elite, thus affecting the impoverished in death as well as in life (Nystrom 2014).

With anatomical legislation allowing for the legal provision of dissection material, medical practitioners returned their attention to honing their unique skills. The transgressive position of cadavers and their acquisition was central to the formative years of establishing medical authority, particularly in surgery and anatomy (Hodge 2013). The history of dissection and anatomical collection is complex in terms of embodiment and exploitation, but also because the use of cadavers was necessary for the medical field to grow and improve into the vast, albeit flawed, system we utilize today.

Collections and Collectors

The early development of physical anthropology within the US is intimately tied to the study of anatomy, and therefore human dissection. Each of the collections discussed in this chapter is an accumulation of individuals who were dissected as part of the educational training of future doctors, anatomists, and/or anthropologists. Cadaver dissection and experimentation were fundamental to the advancement of studies of human variation and anatomy. The importance of both the dissected cadaver and skeleton in the understanding of modern human variation was clearly demonstrated in anatomical teaching techniques. At several institutions, students would macroscopically examine the musculature and soft tissues of the dissected cadaver, alongside skeletonized remains, and a palpable living human body (Cobb 1942).

Skeletal collections cannot be understood or analyzed without careful historical contextualization regarding their procurement, including collector motives and goals. Within the US, the collection and curation of skeletal remains for anatomical research and teaching passed through generations of doctors, anatomists, and anthropologists (Quigley 2001). As illustrated in their histories, the mentoring relationships among anatomists and anthropologists are integral to the establishment of and practices associated with these collections.

George S. Huntington Anatomical Collection (1893–1921)

The George S. Huntington Anatomical Collection, housed at the National Museum of Natural History in Washington, D.C., was one of the first established anatomical skeletal collections in North America and has influenced the research and practices of noted scholars such as Aleš Hrdlička and Robert J. Terry. The Huntington Collection consists of approximately 3070 partial human skeletons accumulated from the anatomical dissection tables of the College of Physicians and Surgeons at Columbia University in New York City between 1893 and 1921 (Table 9.1). Basic biohistorical data recorded for most individuals consists of a name, country of origin, age at death, sex, cause of death, and location of death; all retrieved from hospital records at the time of the body's transfer (Hrdlička 1937; Huntington 1894). The

Table 9.1 Summary of collections

Collection	Dates of collection	Collectors	Approximate # of individual skeletons	Years of birth	Years of death
George S. Huntington Anatomical Collection	1893–1921	George S. Huntington (1861–1927)	3070	1798–1901	1892–1920
Robert J. Terry Anatomical Collection	1910–1967	Robert J. Terry (1871–1966) Mildred Trotter (1899–1991)	1728	1828–1943	1910?–1965[a]
Hamann–Todd Osteological Collection	1893–1938	Carl A. Hamann (1865–1930) T. Wingate Todd (1885–1938)	3100	1823–1934[b]	1912–1938[b]
W. Montague Cobb Human Skeletal Collection	1932–1969	W. Montague Cobb (1904-1990)	680	1846–1941[c]	1931–1969

[a]Information regarding the Robert J. Terry Collection was originally published by Hunt and Albanese (2005)
[b]Jellema (2015)
[c]The years of birth listed for the Cobb Collection are associated with adult skeletal remains. The latest birthdate for the entire collection, associated with an infant, is 1966. Years of birth were calculated by subtracting age at death from year of death and are, therefore, estimates

collection was developed and overseen by Dr. George Sumner Huntington (1861–1927), a leading professor of anatomy at the College of Physicians and Surgeons for 35 years. George S. Huntington dismissed the traditional style of lecturing to large classes and taught cadaver demonstrations to smaller groups of students (McClure 1928). He is credited with helping to shape anatomical research in the US into an independent science rather than a subfield of surgery (McClure 1928).

Beginning in 1893, the skeletal remains of all bodies dissected at the College, except those used for surgical demonstrations, were collected, tagged, processed, and stored in an effort to “render possible a thorough comparative study in reference to racial character, variations and reversions, measurements, etc” (Huntington 1894:13). Huntington’s original vision for the collection was a Museum of Comparative Anatomy which would promote undergraduate opportunities for “extensive morphological and anthropological research” (Huntington 1894:12). Huntington hoped that by amassing a reference collection of skeletal elements which were clearly identified and associated with discrete biohistorical data, researchers would have the opportunity to make scientific advances and contributions to the field of anatomy and physical anthropology. One young researcher who took full advantage of the collection was Aleš Hrdlička, as seen in his 1898 paper “Study of the Normal Tibia.” The museum never came to fruition, but the procurement and use of skeletal remains for the comparative anatomical collection continued for most of Dr. Huntington’s tenure at the College.

Rather than focusing on a collection of complete skeletons, Huntington was primarily interested in obtaining "5,000 of each of the bones of the body" (Huntington 1894:13). The skeleton was not viewed as important as a whole, but in parts; each bone was sorted and stored by element instead of by individual. A Columbia University anatomy course catalog (1892:24) reads, "A valuable feature is the 'Bone-Room,' on the first floor of the college, contiguous to the students' reading-room. Here a large number of disarticulated skeletons are kept, and the separate bones are lent for study, as books are lent from a circulating library." Although Huntington intended for each bone to be studied in the context of diverse biocultural histories (Huntington 1894), separating the skeletal elements limited how each individual's living history could be understood. Additionally, comparing the skeletal remains to library books served to de-humanize the individuals represented and instead presented them as discrete entities of scientific knowledge (Pearlstein 2015).

In addition to the emphasis on individual bones, Hrdlička (1937:263) notes that the collection "was not complete in all respects due to requirements of the dissecting room instruction and incidental conditions …" which implies that the incomplete nature of the individual skeletons is partly due to the dissection process. There are very few associated crania, for instance, due to the thorough dissection of the skull. The cranial pieces that remain with the collection are largely fragmentary, sometimes no more than a calvarium or individual maxilla, and all exhibit postmortem cuts. No ribs were saved because they were sliced through to reach the heart and lungs. Emphasis on separate skeletal elements meant that in many cases, both antimeres were not preserved. The remains that currently comprise the collection are a combination of long bones, scapulae, innominates, partial vertebral columns, hands, or feet.

Robert J. Terry Anatomical Collection (1910–1967)

Another student of Huntington's that would go on to reach prominence within physical anthropology was Robert J. Terry (1871–1966), professor, and later chair, of anatomy at Washington University in St. Louis. Terry's interest in collecting anatomical specimens began between 1892 and 1893 while he was a medical student at Columbia University in New York (Hunt and Albanese 2005). Terry attended Columbia for a year before the financial panic of 1893 forced him to return home to his native St. Louis and finish the last 2 years of his medical training at Missouri Medical College, which later merged into Washington University (Hunt and Albanese 2005). Two years later, Sir William Turner, professor of anatomy at the University of Edinburgh Medical School in Scotland, accepted Terry into his program. Terry's recollections of Edinburgh suggest that Sir Turner influenced him greatly by introducing him to physical anthropology with fascinating courses that were based in lectures, methodology, and laboratory training. Terry claimed this experience with Turner inspired him to pursue physical anthropology and establish his osteological collection (Trotter 1981). Currently housed at the National Museum of Natural History, the Robert J. Terry Collection contains 1728 individuals of known ancestry, sex, and age (Hunt and Albanese 2005; Trotter 1981). Cause of death and some pathological conditions are also recorded.

After he was appointed Chair of the Anatomy Department at Washington University in 1910, Terry began to amass the series that bears his name. While he was inspired by Huntington and Turner, friend and colleague Mildred Trotter (1981) has indicated that Ales Hrdlička also encouraged Terry in his skeletal collecting endeavors. Terry also had personal motivations for creating his own series. He was interested in normal and pathological variations in the human skeleton and "was aware that there was an absence of documented human osteological/anatomical specimens from which skeletal biology, anatomy, and pathology could be investigated" (Hunt and Albanese 2005:407). Terry also wished to provide his students with an anatomical sample to study with, which was a stark contrast to his personal experience at Columbia University, where he had limited access to materials in the anatomical museum and library (Trotter 1981).

Terry did his best to document the individuals that comprised his collection, going beyond the information supplied with each cadaver when it arrived in his lab. He contacted hospitals, clinics, coroner's facilities, and other institutions throughout Missouri, requesting information on known age, occupation, and place of birth (Hunt and Albanese 2005). Thus, cause of death is known for most individuals in the collection. Each person also has a file that includes morgue records, measurements, and an inventory of the bones and teeth present. Others have associated autopsy reports, medical histories, photographs, death masks, and hair samples.

By the time Terry retired from Washington University in 1941, he had amassed over 80 % of what would become the Robert J. Terry Anatomical Collection (Hunt and Albanese 2005). Friend and colleague Dr. Mildred Trotter continued his work, becoming instructor of human anatomy at Washington University and expanding the collection. Her most important contribution to the series was her attempts to balance the demographic composition of the collection (Hunt and Albanese 2005; Trotter 1981)

Terry had worked hard to capture the range of human variation in his collection (Hunt and Albanese 2005) but this proved difficult as race and sex imbalances were initially present due to "the scarcity of female cadavers, and especially white females" (Trotter 1981:507). Trotter (1981: 507) recalled that the "proportion of black to white cadavers was approximately equal in the dissecting laboratories in Missouri," but there were "many years when it was difficult to arrange to have even one or two females among the 40 required for our class of 80 students." As time passed, Terry and Trotter were able to replace fragile and partial skeletons in the collections with those that corrected the sex and race imbalances (Trotter 1981).

The Hamann–Todd Osteological Collection (1893–1938)

The Hamann–Todd Collection, housed at the Cleveland Museum of Natural History (CMNH), was started in 1893 by Carl A. Hamann, Professor of Anatomy at Western Reserve University (WRU), now Case Western Reserve University (Cobb 1959).

Today, the Hamann–Todd Collection comprises more than 3100 individuals born between 1825 and 1910, all of whom are documented with data on name, age, sex, ethnicity, and cause of death (Jones-Kern and Latimer 1996). The series also includes a pathological teaching collection comprising diseases, disorders, and functional impairments.

Carl Hamann was educated at the prestigious University of Pennsylvania Medical School, where he later became an assistant demonstrator of anatomy from 1891 to 1893 (Van Tassel and Grabowski 1996). He was also active in the Philadelphia medical community, serving as a resident at Lankenau Hospital for a year, between 1890 and 1891 (Van Tassel and Grabowski 1996). Hamann's education at the University of Pennsylvania more than likely instilled in him the importance of an anatomical comparative collection as he sought to build one when he was hired at WRU in 1893. Hamann's career excelled at WRU, where he became the institution's youngest full professor at the age of 26 (Quigley 2001). By 1911, he was Cleveland's leading surgeon, serving at both Charity and City hospitals from 1896 until his death in 1930 (Van Tassel and Grabowski 1996). After 19 years at WRU, with the assistance of colleague Dr. N. William Ingalls, Hamann had amassed and catalogued 100 human skeletons (Quigley 2001), most of which were unclaimed dead.

Hamann stopped processing cadaver skeletons in 1912 as he was appointed professor of applied anatomy and clinical surgery. Hamann's replacement was found in British National T. Wingate Todd. Todd was born in Sheffield, England in 1885 to Scottish parents and matriculated at the University of Manchester with "first class honors" in 1907 (Cobb 1959:233). He was described as being a "tall, rugged Scotsman of brilliant intellect, dynamic personality and an amazing capacity for work" (Cobb 1959:233). Shortly after his graduation, Todd was hired by his alma mater as a demonstrator of anatomy in 1908 and by 1910, he had been promoted to lecturer. When the anatomy chair, A.H. Young suffered a stroke, the 23-year-old Todd took over the duties associated with department chair. Todd possessed this ardent work ethic all of his life. His dedication was rewarded in 1911 when he was invested as a Fellow of the Royal College of Surgeons in England.

Dr. Grafton Elliot Smith (later Sir) relieved Todd as department chair in 1909. Smith had a lasting impact on Todd by introducing him to the study of the skeletal remains of "men of antiquity" (Cobb 1959:233). Todd spent considerable time researching human and primate growth and development in the laboratory of British anatomist, Sir Arthur Keith. Keith recommended Todd without hesitation to his colleague Hamann, when the latter asked him "the name of the 'best young man in England" in regard to anatomy (Cobb 1959:234). Thus, T. Wingate Todd was offered the position of Henry Wilson Payne Chair of Anatomy (Cobb 1959; Jones-Kern 1997).

In Cleveland, Todd expanded the Hamann Comparative Anatomy Collection into the Hamann–Todd Osteological Assemblage (Jones-Kern 1997). During his 26 years at WRU, he acquired over 3000 human skeletons for the collection. Many were documented with personal information and had an accompanying file that contained "the death certificate data of name, sex, age, race, birthplace, nationality, occupation and cause of death, the somatological observations and measurements, the photographs, the skin and hair samples and such records of special findings as had been noted for that individual" (Cobb 1959: 234–235). Currently, some of this information is lacking in the collection files, but Todd was meticulous in his anthropometric measurements and the recording of anomalies and pathologies.

Differing from his contemporaries, T. Wingate Todd emphasized the important roles that environment and culture played in growth, development, and overall salubrity. Race, to Todd, was not the sole determinant of one's biology. He had little patience for racism and was one of the first white, male biological anthropologists that trained men of color and women in the discipline. Todd's emphasis on environmental variables, coupled with his interest in skeletal aging, led to publications related to epiphyseal union, cranial suture closure, and pubic symphyseal morphology (Todd 1921, 1924; Todd and Lyon 1925a, b, c, 1937). This research focus is also responsible for the presence of children and infants within the collection.

Todd died in 1938, at the age of 53, from complications of a heart attack. His death marked the end of the collecting period for the Hamann–Todd series, which fell into disuse until it was moved to the CMNH. Despite Todd's death, his legacy would continue in his student and the nation's first Black physical anthropologist, William Montague Cobb.

The W. Montague Cobb Human Skeletal Collection (1932–1969)

The W. Montague Cobb Human Skeletal Collection, curated at Howard University in Washington DC, originally included the remains of over 930 adult and 40 infant skeletons and their associated mortuary records. Due to improper storage and disuse, the number of individual skeletons is now reduced to approximately 680. The skeletons were collected by Cobb between 1932 and 1969; the result of macerated cadavers who were dissected in anatomy classes at Howard University Medical School (Cobb 1936). In stark contrast to Huntington's emphasis on the procurement and storage of skeletal elements, Cobb focused his anatomical research on the individual and the potential influences of social and economic background on morbidity and mortality (Cobb 1935). Hence, Cobb kept meticulous records that included information on age, sex, ethnicity, occupation, nativity, parents' nativities, cause of death, and place of death for many individuals. This documentary archive also includes drawings, photographs, and other notes that relate to anatomy and morbidity.

William Montague Cobb (1904–1990) was raised in the District of Columbia and received his medical degree from Howard University in 1929. It was his desire to contribute to the understanding of human variation that led him to pursue a degree in anthropology. Following the completion of his medical degree, Cobb advanced his studies of anatomy under the advisement of T. Wingate Todd, earning a doctorate in physical anthropology from WRU in 1932. Cobb (1936:11) expressed his admiration for the University's study of child development, and also "its collection of American Negro material and the unbiased attitude which publications based upon this material has revealed."

Immediately following completion of his doctorate, Cobb began the systematic maceration and subsequent collection of cadavers from anatomical dissections. Like that of his mentor, Cobb's collecting was grounded in the understanding of anatomy with strict adherence to the scientific process. The establishment of this skeletal collection would be the first of its kind at an African American institution. Cobb sought to empower the voices of Black scholars as authorities in studies of anatomy and physical anthropology, and therefore on matters of race and human biology (Cobb 1936). In response to pervading race science in anatomical studies, he stated "No American Negro should himself believe such affirmations, but few Negroes and no Negro institutions have been prepared or equipped to make studies of racial anatomy themselves … It should be emphasized, however, that contribution and not defence is the motive of Howard's interest in racial anatomy" (Cobb 1936:10). Cobb's approach to a nonracialized understanding of human development and biological diversity included both teaching and research in biological anthropology and anatomy, and also advocating for equal access to all health care facilities for Black physicians and patients (Rankin-Hill and Blakey 1994; Watkins 2007; Watkins and Muller 2015). Therefore, Cobb embraced the potential political impacts of scientific investigation on combatting preexisting notions of race. He strongly believed sound science would not only influence the academy's approach to the study of human biology, but would serve to hasten social change (Cobb 1936). Cobb's conviction in assuming an authoritative political voice regarding human biology and the concept of racial difference was unique among his contemporaries within anatomy and biological anthropology (Rankin-Hill and Blakey 1994; Watkins 2007).

Cobb earned hundreds of accolades and awards during his many years of contributions to biological anthropology, medicine, and the public. The great disparity between the current recognition of Cobb as scholar and authority within the African American medical community and biological anthropology is substantial (Watkins 2007). Although, the National Medical Association has named an institute in his honor, many biological anthropologists remain unfamiliar with Cobb's extensive works. His contributions are minimized, or silenced altogether, in both graduate education and even histories of physical anthropology (Blakey 2001; Little and Kennedy 2010). The impacts of W. Montague Cobb's research to the understanding of human biology are significant and varied, offering current relevance to the biocultural synthesis which clearly "warrant(s) his inclusion in the bioanthropological canon" (Watkins 2007:187).

Unclaimed, Impoverished, and Institutionalized: The Lives Represented in the Collections

The skeletal collections discussed here may be differentiated in terms of time, space, and even the specific impetuses for their development. Yet they are united in that the majority of remains represent the unclaimed bodies of indigent individuals who were sent to medical schools for dissection rather than buried at the expense of taxpayers. Poorhouses, mental institutions, municipal and charitable hospitals and long-term care facilities were the primary sources of unclaimed bodies, although prisoners and other forms of inmates continued to be included. Thus, the agency-suppressing forces of structural violence have had a profound impact on the demographics of the collections (Fig 9.1; Tables 9.2 and 9.3).

Over 40 % of individuals in the Huntington Collection came from the network of public institutions on Blackwell's and Ward's islands, which physically separated the imprisoned, poor, and afflicted from the general population by housing them in the middle of the East River (Pearlstein 2015). Specifically, these individuals were collected from the hospitals serving the almshouse, workhouse, penitentiary, and mental asylums. The Terry Collection includes unclaimed individuals who died in St. Louis and Missouri public hospitals, mental institutions, and charity clinics (de la Cova 2012, 2014). The Hamann–Todd Osteological Assemblage received unclaimed bodies from the Cleveland and Cuyahoga County morgues, city and charity hospitals, and mental institutions. Todd's quest to expand the collection was made easier based on revisions to Anatomical Laws of the State of Ohio (Jones-Kern 1997) which stipulated that the superintendents of regional mortuaries, city hospitals, charity institutions, and the Cleveland Workhouse had to notify Todd of

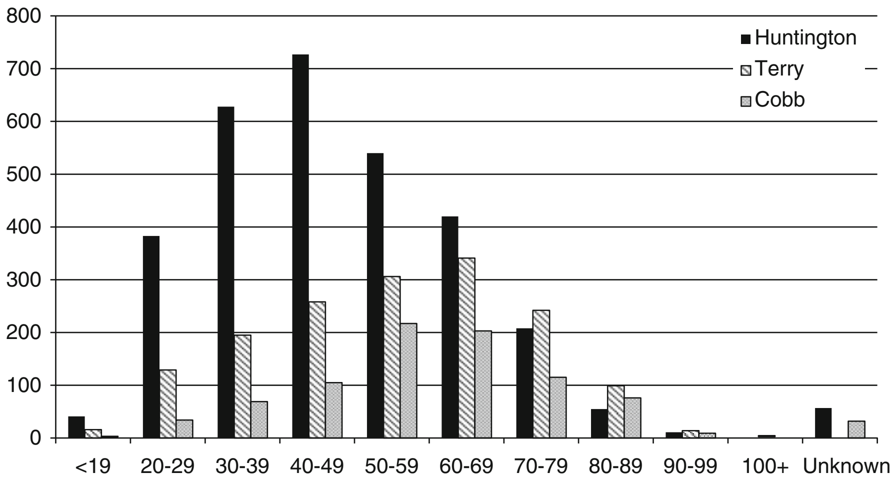

Fig 9.1 Age distribution of adults in the Huntington, Terry, and Cobb Collections. In many instances, exact birthdates were either not recorded by the institutions they expired in or not known by next of kin. This was commonplace in the nineteenth century, when legal birth certificates were not compulsory in many states until the mid- to latter part of the century (de la Cova 2014). Ages were often estimated based on oral reports of the decedent and persons who treated him or her prior to death. In many instances, morgue officials, undertakers, and/or anatomists estimated age based on observations of the cadaver. Therefore, ages remain questionable for the majority of individuals within these collections. Age distribution for the Terry Collection was originally published by Hunt and Albanese (2005). Age distribution is not provided for the Hamann–Todd collection as ongoing research on the historical archive may provide more accurate estimations

Table 9.2 Number of individuals by racial cohort[a]

Race	Huntington	Terry	Hamann–Todd[b]	Cobb
Black	220	938	859	706
White	2849	784	1631	152
Asian	1	5	5	4
American Indian	0	0	0	1

[a]Individuals are placed into current sociocultural racial categories based on the interpretation of multiple historical designations within the documentary archive, i.e., C, Col, Colored, N, Negro, Yellow. The racial designations within the documentary archive are likely to have been assigned to the individual either by medical doctors, morgue officials, or next of kin
[b]Jellema (2015)

Table 9.3 Sex distribution

Sex	Huntington	Terry	Hamann–Todd[a]	Cobb
Females	826	715	377	253
Males	2223	1012	2122	669

[a]Jellema (2015)

unclaimed bodies in their possession (Jones-Kern 1997:176). Similar to the other collections, the majority of those in the Cobb Collection died in local hospitals. Seventeen percent of Cobb individuals died at the District of Columbia long-term care facility known as Blue Plains, or the Home for Aged and Infirm. In addition, Cobb's records note a handful of prisoners whose unclaimed bodies were incorporated into the collection.

Beginning in the 1950s, the Terry and Cobb Collections were impacted by the legalized donation of bodies to medical schools, resulting in a demographic shift away from unclaimed persons (Hunt and Albanese 2005; Trotter 1981). Following World War II, an increase in the standard of living across the US resulted in a surge in individual wealth, and a rise in the number of individuals claiming and burying relatives (Trotter 1981). Social and cultural views about dissection and anatomical instruction also began to change. These shifting opinions ushered in new legislation allowing for legalized body donation which affected the demography and, in some cases, the economic status of cadavers available for dissection (Hunt and Albanese 2005; Overholser et al. 1956). One must take care, however, not to assume that "willed" bodies represent a desire by the next of kin to donate the decedent for medical studies and advancement. In some cases, willing or donating bodies to medical schools was still the most inexpensive means of disposing of the deceased. Relatives and friends of decedents tended to be of similar economic circumstances and may have had no other alternative to the more expensive options of burial and cremation (Muller 2006; Watkins 2003).

While the unclaimed, impoverished, and marginalized may describe the majority of individuals within these collections, immigrants and participants in the Great

Migration were particularly vulnerable to inclusion. The majority of European immigrants and Blacks moving to the North and Midwest lacked sufficient economic and social support systems. Disability due to occupation-related impairment, hazardous or unsanitary living and working environments, poor nutrition and exhaustion, and disease and age forced many individuals to seek out public assistance or hospital care, the primary source of unclaimed bodies.

European immigration to the US peaked in the first half of the nineteenth century, and then again between 1880 and 1920 with the arrival of over 20 million foreign-born individuals. Emigration was driven by widespread economic difficulties and sociopolitical upheaval, and many immigrants arrived from rural, agricultural communities in search of better economic opportunities. Often they traveled alone and had no nearby friends or relatives. As one newly arrived Scotsman observed, if he should die, there would be no one to mourn him (Ernst 1949). By 1900, New York had the largest German, Irish, and Italian populations of any city in the US; combined, these three nationalities comprised the majority of the immigrant population, and their numbers are reflected in the demographics of the cadaver collection process. German, Irish, Italian, and other immigrant groups make up 52 % of the cataloged skeletons in the Huntington Collection, while impoverished native-born Euro-Americans and African-Americans make up 43 % of the collection. The extent to which immigrants are present in the Cobb Collection is not as clear. Only 96 (approximately 10 %) of all adult individuals within the collection have place of birth listed in their mortuary records; only two of these include nativities outside of the US. While migrations from Europe continued to bring new immigrants to the US, native-born individuals were also moving from rural communities to urban and industrial centers such as New York, Cleveland, St. Louis, and Washington, D.C.

The Great Migration (1910–1970) included the relocation of over six million African Americans from the rural South to the urban North, Midwest, and West. This movement was prompted by racial violence, desires to escape Jim Crow, the lack of economic and political opportunity in the South, and the harsh system of sharecropping, combined with natural disasters that impacted crop production. The post-World War I industrial boom resulted in major urban manufacturing centers and created a market for unskilled laborers and jobs that had previously not been open to African Americans. With this massive influx of laborers from the South came increased competition for jobs as well as overcrowding and unsanitary conditions in city neighborhoods. Many individuals in the Terry, Hamann–Todd, and Cobb Collections are likely in-migrants associated with the Great Migration. Within the Cobb Collection, only 13 % of individuals with birthplace listed were born in the District of Columbia. While many were from the neighboring states of Virginia and Maryland, South Carolina, North Carolina, Georgia, and Florida are among the most frequent birthplaces listed. Future historical analysis that incorporates census records may assist in illuminating the actual numbers of men and women in the Cobb Collection who were born in the rural South (Watkins and Muller 2015).

Conclusion

With some exceptions, many of the individuals acquired for these collections were not chosen based upon the presence of pathological conditions and traumatic injuries. However, the literal embodiment of their experiences is encoded upon their skeletons and documented in their mortuary records. In most cases, the recorded causes of death are consistent with those described by Cobb (1935:161) as "diseases of poverty and exposure" such as tuberculosis and pneumonia. While the literal embodiment of political and economic deprivation may be observed within their bones, the presence of their bodies on dissection tables and in drawers in laboratories speaks to the continued impact of structural violence after death.

Cadavers and skeletons fulfill a unique role in the history of anatomy, medicine, and anthropology. The collectors discussed here are distinct from their predecessors, as craniologists and phrenologists of years past sought specifically to support conclusions regarding the superiority of the "white" race. Yet they were operating within a society that sanctioned political and economic deprivation along racial, gender, and social lines. These discriminatory practices affected the dead as well as the living, making the poor and marginalized more vulnerable to an unsanctioned afterlife in medical education. This practice continued to reinforce normalized hierarchical privileging of the educated and predominantly white—"the social elite."

Application of the population-based approach to skeletal analyses, advocated within biological anthropology, is not possible as each collection comprises individuals from many populations which are temporally and spatially separated. These skeletons are biological and social bodies that have archived physiological processes, environmental assaults, and experiences of poverty and marginalization. The skewed demographics of these collections speak to intersections of oppression based upon the axes of race, nativity, religion, gender, and perceived disability.

Anthropologists are uniquely situated both historically and *currently* in their examination of the bodies of those "othered" by those empowered by societies. We have inherited a system of structural violence in which the methodologies for anthropological measurements and identification have been largely developed on the bodies of those devalued and/or discarded by society. We must reflect upon our potential contributions to the perpetuation of structural violence, avoiding an uncritical privileging of scientific discourse and methodology (Blakey 1998; Watkins and Muller 2015). Zuckerman et al. (2014) discuss the potential contributions of the application of relational ethics in establishing a respectful, responsible, and critical engagement within bioarchaeological research. A similar ethos may be applied to studies of documented skeletal collections in which knowledge of the individuals constituting the collections and the means of their acquisition compels researchers to be fully aware of the power position they hold relative to the skeletons they study (Zuckerman et al. 2014). Foundational to such an approach is the reconciliation that skeletons are not merely anatomical specimens to be analyzed for scientific advancement; they are the bodies of individual human beings. A critical, humanistic human biology requires that we are fully aware of the historical documents and narratives that convey the palpable dread of the dissection table among the poor (The Evening World, November 19, 1914; Richardson 1987). Recognition of these beliefs and attitudes towards dissection, as well as our awareness of prevailing power dynamics, may symbolically permit the participation of those researched by refocusing our efforts as scientists (Zuckerman et al. 2014). Our training within anthropology positions us as interpreters of the embodiments of inequality imprinted on human bones and teeth. The most valuable knowledge to be gained from an analysis of these collections is an understanding of the lived experiences of the individuals within them. Carefully contextualized biocultural analyses of these collections give voice to the impacts of impoverishment, marginalization, and institutionalization on individual lives and biologies. As such, this research has current relevance to our understanding of health disparities not only in the past, but today.

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Part IV
Evidence from Almshouse Cemeteries

Chapter 10
Autopsy, Dissection, and Anatomical Exploration: The Postmortem Fate of the Underclass and Institutionalized in Old Milwaukee

Sean P. Dougherty and Norman C. Sullivan

With the increase in urban expansion or redevelopment, the discovery and subsequent study of human remains from historical contexts have grown more and more common. As a result, the publication of several volumes pertaining to historical physical anthropology has become more frequent (Grauer 1995; Saunders and Herring 1995; Herring and Swedlund 2003; Brickley et al. 2006; Novak 2008). While much of the work has focused on issues of health, trauma, and disease, a growing body of work has examined what Waldron and Rogers (1988) once termed "iatrogenic paleopathology," which concerns artificial skeletal alterations made for medical purposes. This includes postmortem examinations, such as autopsies and dissections, which have increasingly garnered the attention of researchers in recent years, as this volume can attest.

As bioarchaeologists seek to place skeletal evidence within its sociohistorical context, defining the nature and motivation for postmortem examinations is important. Interestingly, Waldron and Rogers (1988), and later Waldron (2009), did not make a clear distinction between autopsy and dissection. In 2009, Waldron, having placed autopsy within the category of trauma, grounded his discussion in the history of anatomy and dissection, but referred to postmortem examinations only as autopsy, thus confounding two related, but different, pursuits. Autopsy, in opening the body, seeks to establish cause of death, whether for medical or legal purposes (Hill and Anderson 1989; Wick and Zanni 2003; Park 1994, 2006). Performed by coroners,

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medical examiners, or pathologists, they can be limited in scope, examining only a specific area, or complete, in which all the organs are removed and examined (Sledzik and Micozzi 1997; Wick and Zanni 2003). Dissection, in contrast, is a directed postmortem examination used for teaching purposes, performed by students and lecturers.

The purpose of the postmortem will ultimately affect the treatment of the body, and how it appears in archaeological contexts (Crossland 2009). Because autopsies seek only to discern cause of death, the alterations to the body tend to be less extensive, and fairly repetitive. Craniotomies are common, as is the removal of the anterior thoracic wall, but the body otherwise remains intact, and the "personhood" is retained (Crossland 2009: 109). Dissection, in great contrast, is an exploration that atomizes the body, reducing it to its constituent parts (Crossland 2009; Hodge 2013; Nystrom 2014). The treatment of the body is dictated by the needs of the student, or the subject matter of the course. As such, the physical evidence of dissection, the human remains, will likely exhibit a greater amount of variation with respect to alteration and areas of the body affected, as has been shown by McFarlin and Wineski (1997), for example.

Waldron and Rogers (1988) viewed archaeological examples of autopsied individuals as generally useless as far as determining the cause of death, but valuable for their contribution to the history of medical practice. The latter interest provided a framework for several researchers who encountered postmortem alterations in archaeological contexts (Wesolowsky 1991; Owsley 1995; Anderson 2002; Bugaj et al. 2013). For example, in his report on the human remains from the nineteenth-century Uxbridge cemetery, the discovery of one adult male with evidence of a craniotomy provided the opportunity for Wesolowksy (1991) to discuss the techniques of autopsy during this period. Likewise, in their report on the human remains from the cemetery associated with the Greenwich Tier Hospital, Boston and colleagues (2008) describe four individuals with craniotomies. The authors interpret the cases within the context of dissection, rather than autopsy, and discuss the history of dissection within the region, while questioning why these individuals were selected.

However, in other examples, postmortem alterations were only described in passing as one facet of a paleopathological spectrum: worthy of note, but less relevant than skeletal evidence of disease or antemortem trauma. Crist and co-workers (1997) report the presence of one autopsied female in their study of 56 adults interred within the First African Baptist Church cemeteries of Philadelphia. While they primarily discuss patterns of antemortem injury and demography, the authors briefly conclude that this individual, who also exhibited hyperostosis frontalis interna, was receiving medical care, or had been institutionalized, and was autopsied for educational or diagnostic purposes (see also Angel et al. 1987).

In their report on the human remains from a mid-nineteenth Prospect Hill cemetery in Newmarket, Canada, Pfeiffer and colleagues (1989: 44) briefly described the remains of a pregnant female who, with a craniotomy, but lacking postcranial cut marks, was interpreted as having been "partially autopsied." To the authors, the case was a bit of a curiosity, and, as the authors (Pfieffer, et al. 1989: 44) wrote, "… the intrigue here is to ascertain why this one individual would have been a candidate, and why the exploration was not complete." They speculated that seizures, perhaps related to "toxic reactions" (1989: 44), may have led the physician to examine her brain. Nevertheless, this case is only one point of interest in a narrative concerning the paleopathology of the cemetery sample.

More recent work, however, has used cases of postmortem alteration to illuminate the intersection of class, race, and medical history in the nineteenth-century United States (Highet 2005; Crossland 2009; Hodge 2013). For example, the discovery of the "bones in the basement," while valuable for its contribution to the history of medicine, has also contributed to an understanding of social history and nineteenth-century race relations. The analysis of the bones from the Medical College of Georgia basement revealed a tremendous amount of postmortem medical alteration associated with late nineteenth-century anatomy instruction (Harrington and Blakely 1995; McFarlin and Wineski 1997; Blakely and Harrington 1997). Blakely and Harrington (1995, 1997) demonstrated that Black cadavers contributed to the overwhelming majority of anatomy material. They further investigated the nineteenth-century practice of body snatching for the purpose of anatomy material, finding that while the procurement of cadavers was commonplace, in the South, African-American bodies more so than others were selected for dissection.

While historians have explored the procurement of cadavers from the "lesser classes" for decades (Humphrey 1973; Ross and Ross 1979; Savitt 1982; Laqueur 1983; Wilf 1989; Richardson 2000; Sappol 2002), it appears that it was not until the respective work of Owsley (1995) and Blakely and Harrington (1997) that bioarchaeologists began to take an interest in such practices. In recent years, several researchers have explored, as Nystrom (2014) has described it, the "death experiences" produced by social inequality. Within this theoretical framework, the bodies of the lower class, as voiceless members of society, are anatomized, objectified, and disposed of, sometimes in a proper burial, other times commingled with other bodies in a single grave, or occasionally like any other form of waste (Harrington and Blakely 1995; Davidson 2007; Crossland 2009; Novak and Willoughby 2010; Andrews 2012; Hodge 2013). Their treatment in death reaffirms their status in life while also confirming authoritative status on the dissectors.

While the theoretical framework of social inequality and structural violence does add to the ways in which we can interpret the past, caution must be taken in how such interpretations are applied to their particular contexts. As the skeletal evidence of postmortem examination provides evidence of an event (the postmortem), but not necessarily clear evidence of intention (autopsy or dissection), the interpretive capabilities of the researcher, while supported by a sound theoretical framework, are essentially limited to the physical evidence at hand, whether in terms of the skeletal alterations, or archaeological context. This ambiguity, as Nystrom (2011) correctly reminds us, limits what can be said, as evidence interpreted to be from dissection (structural violence) may actually be evidence of a socially acceptable postmortem examination (autopsy).

Further caution must also be taken when interpreting the archaeological context from which the bodies came. To a certain degree, the archaeological deposition of dissected remains can be predictable. Because dissection promotes the atomization of the body and the separation of its constituent parts, commingled, disarticulated remains would be expected, as were the remains from the Medical College of Georgia. Multiple individuals, intact or disarticulated, within the same grave, can also be expected, as in the case of Charity Hospital, or the Freedman's Cemetery of Dallas, Texas (Owsley 1995; Davidson 2007). Isolated elements may appear in grave fill (Novak, Chap. 5; Novak and Willoughby 2010), or even in more unusual contexts, like an abandoned well (Hodge et al., Chap. 6; Hodge 2013). However, it is important that these forms of postmortem deposition, while, perhaps, symbolizing the undoing of personhood, as suggested by Hodge (2013:132), are not interpreted beyond the scope of the available data.[1] Care must be taken so that in the effort to expose the indignities of the past, the interpretations do not exceed the boundaries of the available evidence.

Thus, it is with both awareness and caution that the practice of postmortem examination is explored among the skeletal remains from the Milwaukee County Institutional Grounds cemetery. In use from 1878 to 1925, the Milwaukee County Institutional Grounds (MCIG) cemetery was the final resting place for many Milwaukee County Hospital residents who sought poor relief (Richards 1997). Residents of the asylum, orphanage, and sanitarium were also interred in the pauper cemetery. In addition, the cemetery also received non-institutionalized individuals from the greater metropolitan area who could not afford private burial. This chapter focuses on the evidence of postmortem alteration observed among a sample of over 1600 burials, and the intersection of poverty, death, and medical practice in turn-of-the-century Milwaukee, Wisconsin.

A Pauper Cemetery in Context

In the new, post-Civil War era of the Gilded Age, cities such as Milwaukee saw a shift from farming to industry. With the construction of railway systems and expansion of harbors along Lake Michigan, the city saw an increase in manufacturing and production, and in the last decade of the nineteenth century, 41 % of the workforce could be found employed in six major industries: iron, steel, heavy machinery production, leather, beer, and railroad equipment (Korman 1967). In 1880, Milwaukee industrial

[1] For example, Davidson (2007) discusses the deposition of the dissected remains of two African-American males. They were buried within the same coffin, one supine, and the other apparently prone and between the femora of the former. The second individual did not have a skull, but it is suggested that had the skull been in place, the face would have been placed on the groin of the other. To the author, this is evidence of the final indignity set upon these individuals as they were placed in what is ostensibly a sexualized position. However, the placement of one body within the legs of another may not have been a matter of flouting propriety (Davidson 2007: 206), but simply a matter of finding the best fit within the shared coffin space. Intentionality, as read through archaeological remains, is never a certainty.

workers made up 44.6 % of the labor force (Gurda 1999). By 1892, the city held over 3000 manufacturing firms, which employed 60,000 individuals (Odell 1892).

Following the tide of industry, immigrants looked to jobs in factories, railroads, mining, or construction. These industries offered jobs for which no experience was necessary, and no wages were too low (Brands 1995; Lears 2009). In 1900, an individual earning an annual salary of $553.00 was considered to be living at the poverty level, and most unskilled workers made considerably less (Painter 2008). This left most unskilled workers in precarious economic circumstances, ill prepared for any unexpected tragedies and the recurrent economic “panics” that plagued the last 30 years of the century (Diner 1998; Chambers 2004; Painter 2008).

It is within this context, then, that the Milwaukee County Poor Farm, the first of the county’s institutions, was born. In the mid-nineteenth century, the expanding population, in combination with both economic and social health problems, led more and more of Milwaukee’s inhabitants to seek aid. In 1852, the 160-acre Gregg Farm was purchased by Milwaukee County to house the poor, the orphaned, the insane, and the physically debilitated that were rapidly accumulating with the growing city. At this time, the inmates of this “catch-all” almshouse, regardless of special needs or conditions, were living within the same quarters (Avella 1987), often in less than sanitary conditions. Six years later, a school was constructed to educate the children, and protect them from the corrupting influence of the adults (Dykas 1974).

In the early years of the Milwaukee County Almshouse, lacking other alternatives, many of the city’s sick crowded the poorhouse. Eventually, in 1860, a separate hospital was constructed for the contagiously ill, and a wing within the Almshouse was converted into an infirmary. In spite of the reported improvements, within a few years the conditions within the Almshouse were so poor as to become “disgraceful to the county.” In response, the County Board of Supervisors made plans to enlarge and repair the facilities. New additions to the hospital were made in 1868, but it was still overcrowded and unclean. Later that year, the County committee thought the insane department to be “clean enough,” but lacking in heat (Avella 1987).

After the original hospital was destroyed by fire in 1880, a new hospital was constructed on the post-Civil War model in which “all patients were cared for in eight spacious and airy wards with large windows on either side. The only private rooms, called ‘strong rooms,’ were used for disturbed or uncontrollable patients” (Karmgerd 1979: 2). The Milwaukee County Hospital, as it was known, ultimately became the center of the institutional system, known for its service to the public, as well as its forward medical and scientific thinking. Even before the turn of the century, the hospital supervisors often boasted the advanced research and medical programs that were under way (Kletzsch 1953; Dykas 1974).

The working poor of the city, lacking money for a private physician, sought treatment from the Milwaukee County Hospital. As one observer wrote, “In those days, all the needy sick went to the County Hospital. No one was turned away.” (Karmgerd 1979: 2). As a rule, any individual who was unable to afford private care in the city was eligible for treatment at the Milwaukee County Hospital. Patients in need of emergency care were accepted without question (Kletzsch 1953).

It should be noted, however, that voluntarily entering a public hospital was no easy choice for anyone in the nineteenth century. Public hospitals carried a great stigma at the turn of the century as being a place for only the "least enterprising and lacking in self-respect … even a wretched and filthy hovel seem often preferable" (Rosenberg 1987: 116). In addition, hospitals were rumored to be places of where the poor were subjects of unthinkable experimentation, where young physicians "… exercise their ingenuity in killing, or curing, with impunity" (quoted in Rosenberg 1987: 116; see also Richardson 2000).

Yet, in spite of any misgivings about hospital care, the poor of Milwaukee sought aid at the Milwaukee County Hospital in increasing numbers well into the twentieth century. Single male laborers were the primary recipients of hospital care, a trend also seen nationally during this period (Rosenberg 1987). In 1890, the hospital treated only 863 patients. By 1925, the number had risen to 4468. For most years, males account for over 70 % of the hospital patients, with most being of German origin or descent. The overrepresentation of male patients at the hospital may reflect nineteenth-century migration trends in which migrants were frequently lone young males seeking employment and intending to return home (Nugent 1995). It could also reflect the disproportionate availability of familial care networks for women (Katz 1996).

The stresses of the Gilded Age suffered by adults also affected their children. For many immigrant families, migrating to America often severed connections to extended family networks. Lacking such support, economic instability often led to disruptions of family life that were associated with increases in homelessness, alcoholism, prostitution, and orphaned infants and children (Hewitt and Mickish 1987). Milwaukee County officials had to contend with increasing number of children in need. Although children's institutions were commonly thought of as orphanages, very few children committed to institutions were true orphans. Rather, turn-of-the-century institutions sought to provide protection and safety from broken homes and parents of deficient moral character (Ashby 1984; Meckel 1998). The children of unwed mothers, the reformers believed, having inherited the evils of their mother, would live on to continue the cycle of immorality and pauperism (Lowell 1879; Lynde 1880). This practice is visible at the Milwaukee County Home for Dependent Children, where the vast majority of children were removed from families deemed unable to provide sufficient care, moral or otherwise. Away from the corrosive influence of their pauper parents, the children could find in the institutions the "moral and intellectual treatment as would re-create them" (Lowell 1879).

Prior to the 1870s, children, if they were not bound out for service or adopted, were housed among the general Milwaukee Almshouse population. However, in 1871, inspections by the progressive Mary EB Lynde criticized the County administrators for the poor and neglected conditions of the institutionalized children (Avella 1987). After much debate, deliberation, and, often, general indifference, the County established a temporary children's home in 1882. This soon, too, grew overcrowded. In 1898, the Home for Dependent Children was established, and housed children between the ages of 5 and 16 (Avella 1987). Within 2 years, infants and young juveniles soon filled the admittance rosters.

Institutions such as those in Milwaukee County were plagued with high rates of infant mortality. At the seventh annual Conference of Charities and Corrections, FB Sanborn, in response to a paper given by Henry B. Wheelwright that argued for separate infant asylums, declared, "The deaths at the almshouse … included almost the whole number of infants – some years not more than five percent, some years a few more survived, but in a few years did the number of survivors equal ten in the hundred. Practically they all died …" (Sanborn 1880: 260). The Home for Dependent Children, in separating the children from the Almshouse adults, sought to create a safe and healthy environment for indigent children, but it could not prevent the deaths of the most frail. These infants and children, like their older counterparts, were buried in the Poor Farm Cemetery.

The adults and children interred in the county cemetery were done so at the expense of Milwaukee County, which attempted to keep costs low. In 1896, the dead were buried for the sum of $1.95 (Dykas 1974). By the first decade of the twentieth century, however, the occupants of the institutions provided in-house mortuary services. Able-bodied residents were put to work building caskets and digging graves that were to be no less than 6 ft deep (MCH 1900).

At the turn of the century, it was not uncommon for the poor to turn over their dead to the city, although they did so with much grief, shame, and fear. Hoffman (1919) suggested that the great disgust the poor felt about the Potter's Field was linked to how they wished to be remembered. The Potter's Field was the final display of indigence, misfortune, and defeat. He observed that the poor would spend what little money they could save on a gaudy funeral, often a poor imitation of funerals for the wealthier classes. It was his opinion that they were determined to distance themselves in death from their circumstances in life. Or, as Laqueur (1983: 109) would later describe it, the pauper funeral lingered as a "specter of failure."

However, the fear of a pauper burial was not always a matter of how one wished to be remembered. The postmortem use of the indigent corpse was a common practice in the nineteenth and early twentieth centuries (Hoffman 1919; Richardson 2000; Sappol 2002). It was often the case, according to county and state contracts, that bodies would be turned over to anatomy schools if they were unclaimed and unidentified (Hoffman 1919). However, this practice was not always followed. Hoffman (1919: 113–115) cites at length a case from Indianapolis, Indiana. In the spring of 1917, Arthur C. Whiteside, the undertaker of the Marion County Potter's Field, was accused of selling pauper remains to the Indiana University School of Medicine for which he received five dollars per Marion County body, and an additional five dollars if the body was from the Julietta Asylum. Incidents such as these, Hoffman concludes (1919: 91), are a great source behind the "common horror of a pauper burial."

Unfortunately for many, the economic instability of the decades surrounding the turn of the century rendered the horror of pauper burial unavoidable. From 1873 to 1913, economic crashes, or "panics," occurred nearly every decade. In the Panic of 1893, for example, it is estimated that 2,000,000 workers found themselves unemployed (Painter 2008). It is no surprise, then, that those interred within the MCIG cemetery should represent a diverse body of occupations. Richards and Kastell (1993) and Richards (1997) report that the majority of those buried within the cemetery were laborers, but housewives, tailors, carpenters, teachers, and bartenders are also present among the dead. The common denominator that bound them in death was not social class, but simply an inability to afford a private burial.

In the period from 1899 to 1907, the majority of individuals interred in the county cemetery were those who died within the Milwaukee County Hospital (Dougherty 2011). Only 10 % can be attributed to the Milwaukee County Almshouse and the Milwaukee County Asylum. However, 38 % of the dead were nonresidents of the institution, and represent individuals from the city who lacked the funds to insure a private burial or lacked family to arrange one. Many were adult male victims of drowning, homicide, or railroad accidents, who were collected by the city morgue.

For the nonadults interred within the cemetery, the trend was similar (Dougherty et al. 2005). Although institutionalized children were housed within the Home for Dependent Children, very few actually died there, or in other county institutions. Fifty-nine percent of nonadult deaths occurred outside of institutional walls.

While it is tempting to characterize the MCIG cemetery as simply a "pauper" cemetery, it must be recognized that burial within the Poor Farm Cemetery is only the end of a sequence of apparently unfortunate events. Residents of local public and private institutions, though interred within the Poor Farm cemetery, had once been city dwellers and participants in local industry. The non-institutionalized dead may have been itinerant residents of the Almshouse, or occasional patients within the Milwaukee County Hospital. They were unified in death by their inability to afford a private burial, or their lack of family to arrange one. To characterize those interred within the MCIG cemetery as "paupers" ignores the complexity of the turn-of-the-century immigrant/working-class experience, and denies them the history of their own experiences. In the late nineteenth century, as Painter (2008: xx) notes, "Class, particularly, when it comes to the middle class, is a fluid category that includes individual (or family) self-definition, tastes and attitudes." Wealth and class were only loosely connected. For example, teachers, though middle class, earned less than members of the working class. This is particularly important in light of recent research in the history and bioarchaeology of dissection (e.g., Humphrey 1973; Blakely and Harrington 1997; Richardson 2000; Sappol 2002; Nystrom 2014) that emphasizes the use of poor and disenfranchised populations. Individuals assumed to be poor by virtue of their burial experience may have lived middle class or working class lives.

The MCIG Cemetery Sample

The skeletal sample used for this study is derived from the large cemetery population excavated from the Milwaukee County Institutional Grounds cemetery in 1991 and 1992. In 1991, the early stages of construction for the Ambulatory Care Center associated with the Milwaukee County Medical Complex disturbed a portion of the cemetery. In accordance with Wisconsin statutes, construction was halted, and rescue excavations commenced in September of 1991 under the direction of Patricia Richards, who was in the employ of a local cultural resource management company, Great Lakes Archaeological Research Center (Richards and Kastell 1993; Richards 1997). Since the excavated areas of the cemetery were those that would be directly impacted by the planned construction of medical facilities and parking structures, only a portion of the entire cemetery was removed. It is estimated that the cemetery contained nearly 5000 burials (McBride 1992).

In the nineteenth and twentieth centuries, three county cemeteries were used successively. Based upon death certificate entries, Richards (1997) determined that the first Potter's Field was used from 1872 to 1882, although it is highly probable that the cemetery was in use since the 1850s after the purchase of the Gregg Farm. The second cemetery was in use from 1882 to 1925, according to the Register of Burials at the Milwaukee County Poor Farm, although death certificates indicate an earlier date of 1878 (Richards, personal communication; Richards et al., Chap. 11). Survey of the area determined that a portion of this cemetery had been previously disturbed in 1932 during the construction of a dormitory for nurses (Richards 1997). The third cemetery was in use from 1925 to 1974. It was the second cemetery that was excavated.

The 1991/1992 excavations recovered a total of 1649 burials (Richards 1997). Only 985 adult and 363 nonadult skeletons were sufficiently complete for analysis. Adult skeletal remains were evaluated for age and sex following the standard protocols (Buikstra and Ubelaker 1994). When possible, juvenile and subadult ages were estimated using both dental development (Gustafson and Koch 1974) and postcranial measurements (Scheuer and Black 2000). Because long bone measurements were used to estimate age for many individuals within the early natal cohorts, it is possible that the estimated skeletal age reflects disrupted skeletal growth rather than true skeletal age. Consequently, several ages could be underestimated. Individuals were assigned into the following age categories: fetal, perinatal, infant (B–1), juvenile (1–12), subadult (12–19), young adult (20–34), middle adult (35–49), and old adult (+50). The category of subadult is based, perhaps loosely, on the period between the eruption of the second permanent molar and the completion of the adult dentition.

Of the 985 skeletons, 75.6 % (n=745) were determined to be male or probable male. Females or probable females accounted for only 12.7 % (n=125) of the sample. In both cases, middle adults are most frequently represented. There were 115 individuals for whom sex could not be identified. Of these, 112 lacked sufficient preservation to establish age, so they could only be estimated as "adult." For convenience and comparability, "probable" sex estimates were absorbed into male and female cohorts, respectively. Individuals falling within the middle adult age cohort are the most common (Table 10.1).

The mortality profile of the nonadult sample broadly meets expectations given the reported mortality trends of the nineteenth century (Fig. 10.1). Fetal or perinatal deaths are high, although it is possible that, due to developmental disruption, some ages were underestimated. Nonadult mortality is high also within the first year of

Table 10.1 Adult sex and age profile with pooled sex estimation categories

	Adult	Young adult	Middle adult	Old adult	Total
Male	50	106	415	174	745
Female	14	32	47	32	125
Unknown	112	1	0	2	115
Total	176	139	462	208	985

Fig. 10.1 Nonadult mortality profile

life, and declines dramatically thereafter. The mortality profile of the nonadults has been shown to resemble that of the Home for Dependent Children where, for most years, infant death surpassed all others in frequency (Dougherty et al. 2005).

Evidence of Postmortem Examination among the MCIG Sample

One hundred and sixty-five individuals (12.2 %), 159 adults and 6 nonadults, were found to have some manner of postmortem alteration (Table 10.2). Among these adults, 79.8 % were male, primarily of middle adult age. Only 9.43 % of the sample was composed of females, although unlike the male cohort, nearly half were young adults (43.7 %). The trend seen here reflects the general demographic trend within the greater cemetery sample in which a disproportionate number of males are represented.

Several individuals with postmortem alterations showed evidence of traumatic injury during life, as well as evidence suggestive of cause of death (Table 10.3).

Table 10.2 Age and sex distribution of individuals with postmortem alterations

	Perinatal or infant	Subadult	Young adult	Middle adult	Old adult	Adult	Total
Male			15	79	29	4	127
Female		1	7	3	4	1	16
Unknown	5			1		16	22
Total	5	1	22	83	33	21	165

Table 10.3 Frequency of pathological skeletal lesions among individuals with postmortem alterations

	Antemortem traumata	Perimortem traumata	Non-traumatic lesions	None
Male	45	3	24	55
Female	1	1	3	11
Adult, unknown sex	1		4	12
Nonadult				5
Total	47	4	31	83

Forty-seven adults (28.4 %) had at least one healed fracture, but only one was female. In addition, four individuals, three of which were male, had perimortem fractures. While it is tempting to consider that the presence of the injuries, whether ante- or perimortem, was a factor that contributed being selected for postmortem alteration, it is more likely due to the nature of the cemetery sample. As Dougherty (2011) has shown, this sample, primarily comprised of male laborers, had 486 antemortem fractures distributed among 247 individuals, or 25 % of the observed sample of adults. Given that, it is not unexpected to find a number of those individuals with antemortem injuries within this group. Moreover, given that several of the antemortem fractures affected minor elements, like ribs, metacarpals, or metatarsals, it is questionable as to whether those skeletal changes would have been sufficiently noticeable or unusual to warrant postmortem exploration. However, it is still possible that the selection process was more idiosyncratic, and more visible lesions, such as cranial-facial fractures, could have influenced selection, as could perimortem fractures with subsequent mortality.

Non-traumatic bone lesions, typically indicative of infectious disease, were observed on 31 individuals (18.7 %), only four of which were female. While nonspecific indicators of physiological stress (e.g., cribra orbitalia and porotic hyperostosis) were not uncommon, these were often expressed as non-active lesions. In addition, there is evidence of a high frequency of infectious diseases, including tuberculosis and venereal syphilis, present among the MCIG sample (Milligan 2010), so it is not surprising that at least some of those cases would be present among this subsample of autopsied individuals. However, as Sappol (2002), as well as others (Hoffman 1919; Moore 2005; Novak and Willoughby 2010), has noted, individuals with unusual diseases or physical conditions were highly desirable subjects for postmortem examination in the nineteenth century. Thus, there remains the possibility that some of these individuals, perhaps with only soft tissue manifestations of their conditions, were purposefully selected for examination, whether for autopsy or dissection.

A variety of postmortem cranial and postcranial alterations were observed among the MCIG sample. The most frequent procedure was the craniotomy, with 127 (76.9 %) observed among the 165 individuals. Forty-eight individuals exhibited postcranial alterations. However, in only 12 cases were the two concurrent. Ten individuals appear to have been decapitated, and postcranial modifications were also present among these. Postcranial alterations included linear osteotomies, laminectomies, hemisections, and long bone excisions in which a small section of cortical bone was removed from the diaphysis, exposing the underlying spaces.

Craniotomies and Other Cranial Alterations

Craniotomies were the most commonly observed type of postmortem alteration, both for the cranial region and the sample in its entirety (Table 10.4). Two general forms of craniotomy were identified: circumferential and wedge shaped. On average, the procedures transected the frontal bone 39.7 mm above nasion.

Both forms of craniotomy appear in the medical literature of the nineteenth and early twentieth centuries. The circumferential craniotomy, which can be completed with one cut, but occasionally required more, removes the calotte of the skull by sawing circumferentially along the transverse plan. This method has been described as the easiest to make (Blackburn 1892), as well as the most common for "anatomic work," as it provides unobstructed access to the brain (Wadsworth 1915: 197). Notably, in his *Handbook of Morbid Anatomy*, Box (1910) provides no alternative to the circumferential technique, whereas, in contrast, Blackburn (1892: 27) admits, "The bone may be divided in any way preferred by the operator … and perhaps as good as any, is the circular."

The wedge-shaped craniotomy requires at least two intersecting incisions, but may necessitate three. One incision, which may be divided into two separate actions, sections the vault along a near-coronal plane, often posteriorly oblique, superior to

Table 10.4 Frequency of individuals with postmortem cranial alterations

	Craniotomy	Sectioned mandibles	Trepanation	Exploratory incisions	Decapitation
Male	105	4	3	2	7
Female	10		1		
Adult, unknown sex	7				3
Nonadult	5				
Total	127	4	4	2	10

the mastoid process, typically passing through the sagittal suture. The final cut, which runs roughly along the transverse plane, begins at an intersection of one of the oblique incisions, and terminates at the intersection of the oblique incision on the opposite side. This creates a wedge-shaped calotte that is noted to retain some stability when replaced. It is for this reason that the wedge-shaped method was suggested for those cases in which physical disfigurement should be kept at a minimum, and ease and stability of repair are required (Wadsworth 1915). A further advantage is that "the calvaria (*sic.*) retains its place when the scalp is replaced, whereas if the circular incision is used the piece must be fastened on with wire, or otherwise" (Blackburn 1892: 27).

Among the MCIG sample, the circumferential technique was, in general, the most frequently observed method for the sample (52 % of the craniotomies). However, slight sex differences are present in that of the ten craniotomies present among females, seven were circumferential. In contrast, just under half of the male craniotomies (50/105; 48 %) were of this type. Among individuals for whom sex could not be estimated ($n = 7$), the craniotomies were circumferential. In three cases, attempts had been made to bind the base using rectangular, copper staples.

Of the six nonadults present, including a subadult female, all displayed evidence of circumferential craniotomies. While an early twentieth-century medical manual (Box 1910: 220–221) suggests that for infants, the cranium can simply be opened with a sharp scissors, and, by cutting along the sutures, the bones of the skull can be "forced open like the petals of a flower and the brain exposed," false start marks parallel to the line of incision suggest that for each of these cases, the chosen implement was a saw, as was the case among the adults.

Four individuals exhibit evidence of trepanation. In two cases, both middle adult male individuals (Burials 3041 and 5150), it appears that the skulls were trepanned after death, and likely represent attempts at practicing the surgical technique. Burial 3041 has what appears to be a large, postmortem trepanation of the left parietal and temporal (Fig. 10.2). The alteration was made using 19–20 separate actions, each with a diameter of about 7 mm, although the overlapping, scalloped edges likely obscure the true dimensions of each trepanation site. With the ring of holes complete, an elliptical section (63.6 × 41.3 mm) was removed. The other individual, Burial 5150, has a similar trepanation. In this particular case, there is an ellipsoidal trepanation of the left parietal inferior to the superior temporal line that ran inferior to the craniotomy line. Recent research into the duration of the postoperative healing period has shown that trepanations can take over 2 months to show signs of healing, and may not exhibit complete obliteration even after several decades (Nerlich et al. 2003). It is, therefore, potentially difficult to assign the operation to a perimortem or postmortem period. However, the two trepanned crania do not show any of the polishing associated with wet bone alteration (Boylston et al. 2000), suggesting that the boreholes were created well after death.

For the other two examples, it is unclear as to whether the procedures were performed as a method of surgical intervention near the time of death, or performed within a short period after death for other purposes. In these two cases, there is evidence of perimortem cranial trauma, which could have necessitated surgical

Fig. 10.2 Postmortem trepanation, Burial 3041

intervention. However, the manner of the trepanations, a series of radiating, linear cuts, possibly from a Hey's saw (see Thompson 1942: 58), as well as the presence of other postmortem alterations, such as a bisected mandible, does suggest more than simply an attempt to remedy the patients' respective conditions.

Experimental or practice trepanations were not the only form of cranial excisions observed among the sample. Two individuals had cranial alterations that are suggestive of surgical exploration. The frontal bone of Burial 8047, an old adult male, had bilateral openings (right: 49.95 mm wide; left: 41.4 mm wide) through the outer table that were made to expose the frontal sinuses, apparently with the use of a small chisel (Fig. 10.3). The midline septum of the frontal sinus was left intact, but the exploration continued through the superior orbital plates. In Burial 8174, several cuts to the right temporal bone excised the mastoid process, exposing the sinus spaces within. The left mastoid may have been treated in a similar way, although post-depositional destruction makes this unclear. Notably, both individuals had additional alterations. The right radius and ulna of Burial 8047 were transversely sectioned at the level of the radial tuberosity, and the right radius, ulna, tibia, and fibula of Burial 8074 were sectioned, as well. In addition, the right mandibular body of Burial 8074 was sectioned three times between the area of the first incisor and the second molar. The second incision passed through the crown of the first molar, exposing the pulp cavity. Three other individuals had similar mandibular alterations.

While postmortem alterations to the skull are not unexpected, the MCIG sample also included ten individuals (seven males, three females) from whom the skull was detached and removed from the body. Three of these examples are from commin-

Fig. 10.3 Exploration of the frontal sinuses, Burial 8047

gled burials that contained elements of a second individual. For five of the individuals, the lower cervical vertebrae remained in situ, and displayed multiple transverse kerfs that are consistent with decapitation by saw. For example, for Burial 2023, a transverse cut through the sixth cervical vertebra removed half of the right inferior facet and the right inferior quarter of the vertebral body. The saw blade dug deeply into the remaining portion of the body at about midline, and illustrates well the anterior-posterior progression of the blade. Also present is what appears to be the inferior quarter of the fifth vertebra, which is the only remnant of an oblique cut that may have been the final decapitating action. In contrast, for the other five cases of decapitation, the evidence is simply the absence of a skull, and, occasionally, one or more cervical vertebrae, in an otherwise intact grave. In four cases, postcranial incisions were present, most commonly in the form of sagittal sections through at least one clavicle, although in the case of Burial 7198, the clavicles were absent, but the left scapula was sectioned through the junction of the acromion and the spine. Burial 2077, however, lacks both the skull and the cervical region of the spine, but does not display any other postcrania alterations.

Sectioned Limbs and Other Postcranial Alterations

Postcranial alterations were observed among 48 individuals, 30 of which were male, and were observed to occur in all body regions. In general, the sample displayed four forms of postmortem alterations: linear osteotomies, laminectomies, vertebral hemisections, and diaphyseal excisions (Table 10.5). In 14 cases were the postcranial changes present with some form of cranial alteration.

Table 10.5 Frequency of individuals with postmortem postcranial alterations

	Linear osteotomy	Diaphyseal excisions	Thoracotomy	Laminectomy	Vertebral hemisection
Male	13	3	8		1
Female	3	1	1	2	2
Adult, unknown sex	10				
Total	26	4	9	2	3

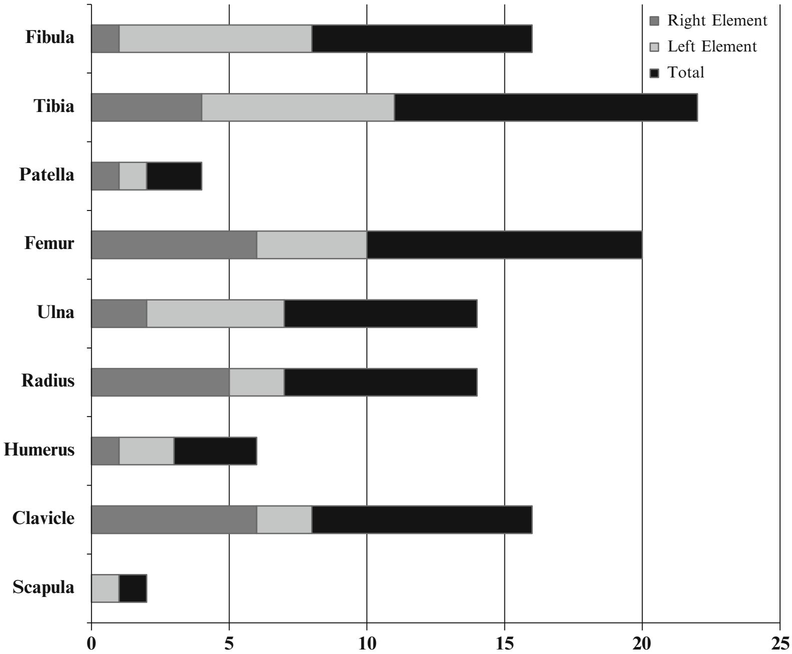

Fig. 10.4 Frequency of appendicular elements with evidence of linear osteotomy

Twenty-six individuals exhibited linear osteotomies of the long bones. These were typically complete transverse sections through the diaphysis, with the proximal third being the most frequent location. The tibia was the most frequently sectioned bone, followed by the femur (Fig. 10.4). In 15 (57.6 %) of the cases, more than one long bone was sectioned, although this number often reflects the use of parallel bones, such as the tibia and fibula, or bilateral elements. However, 11 individuals (42.3 %) did have linear osteotomies in multiple appendicular locations. Notably, when linear osteotomies were present, only four were concurrent with postmortem incisions within the postcranial axial skeleton. Ten individuals had both cranial and long bone incisions.

The anatomical locations for the linear osteotomies were highly variable. For example, Burial 7099, an adult female, had multiple upper limb bones sawn apart. In this case, the left elbow and right forearm were sectioned. For the left elbow, the distal humerus was sawn above the articular surfaces, bisecting the olecranon fossa. The left ulna was sectioned distal to the coronoid process, bisecting the radial notch. False-start kerfs on the posterior surface, as well as anteriorly located bone tags, reveal a posterior-to-anterior progression. Eight fine-cut marks, three of which are present along the lateral supracondylar ridge, suggest the removal of soft tissue. The right ulna and radius were sectioned at the distal third, but the visible cut marks suggest an anterior-posterior progression.

Twenty individuals were missing diaphyseal regions associated with the location of the incision. Distal diaphyseal fragments were absent in nine individuals. Proximal diaphyseal regions were missing in ten cases. Three individuals had long bones with both proximal and distal regions removed. For example, Burial 3039, a male with vertebral lesions suggestive of tuberculosis, had a sectioned right femur. The proximal third of the bone and the left os coxa were not present. Perhaps more curious, in another case, Burial 9223, the middle third of the right femoral diaphysis was excised, but the adjoining proximal and distal thirds of the diaphysis remained in place.

It is conceivable that at least some of these procedures represent failed amputations, a surgical procedure not uncommon at the Milwaukee County Hospital (Dougherty 2011; Dougherty and Sullivan 2009). However, mortality from amputations, even in the pre-antibiotic era, was not as high as one would expect. Examining archival data from the Royal Berkshire Hospital, Galland (2003) found that out of 276 amputations that had been performed from 1839 to 1879, only 7.6 % did not survive. Mortality was highest for those who underwent limb amputation following a compound fracture, which suggests that preoperative infection or blood loss may have been a factor. Writing in 1841, John Phillips Potter presented the results of amputations performed at the University College Hospital, London (Potter 1841). Out of the 66 amputations performed, only ten patients died. Many of Potter's reported fatalities received amputations as a treatment for severe limb trauma, often compound fractures.

Among the MCIG sample of linear osteotomies, none show evidence of perimortem skeletal trauma or other lesions that would necessitate amputation, or suggest cause of death. In addition, the frequent presence of false-start kerfs, breakaway spurs, the absence of proximal and middle diaphyseal bone regions, and the inconsistent loci and saw progression suggest a lack of speed, urgency, and location that would otherwise characterize most amputation performances (Thompson 1942; Stanley 2003). This would seem to indicate that most, if not all, of the diaphyseal transections observed among this sample were inflicted after death, for nonsurgical purposes.

Four individuals (one female, three males) exhibited femora or tibiae in which segments of cortical bone were removed from the anterior aspect of the shaft (Fig. 10.5). The femoral segments were trapezoidal in shape, with lengths no longer than 34.9 mm. In contrast, the cortical segments removed from the tibiae were generally rectangular, and encompassed a portion, if not all, of the anterior crest. The longest example was 134 mm. As no pathological changes were evident on these specimens,

Fig. 10.5 The right femoral diaphysis of Burial 8125 exhibiting a 34.9 mm section of cortical bone excised from the anterior surface

it was considered that the removal of the cortical sections could be results of practice block osteotomies, which are used to correct long bone curvatures caused by rickets or other pathological conditions. However, block osteotomies do not necessitate large sections, so while the femoral cases could be examples of the block osteotomy technique described by Ryerson (1933), the lengthy tibia extractions suggest other purposes. In either case, whether on femur or tibia, the removal of cortical segments allows the observer a view of the medullary cavity and bone marrow, as well as the cross section of cortical bone. This may be the sole purpose for such alterations.

Postcranial axial alterations indicative of thoracotomy were also observed. Six individuals had cut marks to the sternum, most often invading the clavicular notches. Notably, no other postcranial element showed evidence of cutting in these cases, although three did suffer craniotomies. Only four individuals had evidence of sectioned ribs. The low representation of cut thoracic elements exhibiting postmortem alteration is unexpected, given the high frequencies of craniotomies, and other alterations. Given the generally poor preservation of thoracic elements relative to other bones, likely due to coffin collapse, the infrequency of thoracic cage involvement may be an artifact of post-depositional changes (Dougherty 2011). However, contemporaneous postmortem manuals do instruct the examiner to cut through the costal cartilage, rather than the ribs, to expose the thoracic cavity (Blackburn 1892; Box 1910; Wadsworth 1915), and the infrequency of cut ribs among the sample may reflect this.

Fig. 10.6 Thoracic laminectomy of Burial 2008

Five individuals had cut vertebrae, excluding those already described as having decapitations. In these cases, both laminectomies and midsagittal sections were performed on thoracic and lumbar vertebrae, and sacra. The most extensive laminectomy was observed in Burial 2008, a young adult female, in which the laminectomy was continuous from the first thoracic vertebra to the first sacral segment, a procedure that would have exposed the dorsal spinal cord and cauda equina, as well as the associated structures (Fig. 10.6). Hemisections of the sacrum and lumbar vertebrae were observed in three cases, and would have provided a midsagittal view of the pelvic viscera. In one case, the commingled Burial 2100, a lumbar vertebra was found to have undergone a transverse cut through the body, which would have severed the lower abdominal region from the upper portion of the torso.

Postmortem Examination in Context

Sometime in the late nineteenth century,[2] Dr. John K. Bartlett (1816–1889) addressed the annual meeting of the Milwaukee County Medical Society, one of the many early attempts at a medical society within the city. His speech was a chronological history of the physicians, epidemics, and medical societies of old Milwaukee.

[2] Undated manuscript on file at the offices of the Milwaukee Academy of Medicine. The Milwaukee County Medical Society was active from 1846 to 1853, only to become dormant until 1879. As this address was a history of medical societies from 1841 to 1853, it is possible that this address dates to 1879, when the society was rekindled.

Wishing to "season dry facts" (Bartlett n.d.: 8), he recounted the story of an unnamed colleague who, in November 1845, was looking to "brush up on anatomical knowledge." The nameless physician and a colleague chose the Spring Street (now, Wisconsin Avenue) burial ground, the most convenient of three cemeteries in use. Having observed the cemetery for several days, the doctor and his colleague made their move, "I need not say we were successful. Slung upon our backs we bore away our prize, and that skeleton still adorns the private museum of one of the most honored members of the Milwaukee Co. Medical Society" (quoted in Bartlett n.d.: 8).

Not long after, a local farmer had fallen from his wagon, and broken his neck. Knowing where the body was housed, the same unnamed doctor, with another colleague, sought to obtain this fresh specimen. Having removed the body from its coffin, they replaced it with its weight in bricks. Weeks later, in want of another anatomical specimen, the doctor and his friend explored a fresh grave: "…'With an inch auger, he bored a few holes across the head of the board, and removed the upper portion, he then ran his hand down the coffin to feel the face of the corpse, and satisfy a natural curiosity as to the sex of his subject, when [to] judge of his mortification, [he was surprised] to find nothing there but the brickbats he had helped to load that coffin with a couple weeks before'" (quoted in Bartlett n.d.: 9).

And so, Bartlett's address was thusly seasoned. It is, of course, only left to speculate the audience's response, but we can imagine a form of laughter that shared, familiar experiences tend to produce. This was a room of medical men, after all, most of whom had trained in the eastern United States, or abroad (Frank 1915), and the macabre absurdity of the dissection room, the follies of the experience, and the questionably legal act of obtaining and disposing of bodies were likely familiar to all. The "tom-foolery" of the dissection room was a humor all former medical students could understand and partake in (Sappol 2002; Warner and Edmonson 2009).

Body snatching was not a unique occurrence in the post-Enlightenment era of medicine, both in the United States and abroad (Waite 1945; Kaufman and Hanawalt 1971; Ross and Ross 1979; Richardson 2000; Sappol 2002; MacDonald 2006). Prior to the Civil War, anatomy was already embedded in the medical educational process (Blake 1955). Yet, as the need for physicians increased throughout the nineteenth century, the establishment of numerous medical schools, licensed or unlicensed, often short-lived, created a new, competitive market for medical education (Blake 1955; Numbers 1981). Prospective and enrolled students alike placed pressure on educational institutions to provide a dissection component, as this was seen to be on the forefront of medical science (Sappol 2002; Warner and Edmonson 2009). As a result, human bodies for dissection were undersupplied, yet in great demand (Edwards 1951; Blake 1955).

In addition, beginning in the latter part of the nineteenth century, medical education in the United States was undergoing a shift from an apprenticeship to a standardized curriculum, in part because of the growing public demand for properly trained physicians. This was the consequence of a movement aimed at professional recognition for practitioners in the field (Numbers 1981; Potter 1999). As a result, by the early twentieth century, the formal education of future physicians would require extensive training in anatomy. This, however, created, in Edwards' (1951: 178) view, an uneasy paradox: "On the one hand, the public demanded of practitioners of medicine and surgery a practical knowledge of anatomic structure … while on the other hand, the forces of human prejudice, ignorance, superstition, and piety in the legislative halls united in a conspiracy to prevent medical students from acquiring such knowledge." Within this context, law, or lack thereof, and traditional beliefs often impeded the acquisition of cadavers for training in anatomy, and "resurrection men" sometimes filled the demand (Dwight 1896; Humphrey 1973; Richardson 2000; Warner and Edmonson 2009).

Unfortunately, the extent to which body snatching was practiced in Milwaukee during the nineteenth century is not known. A statute prohibiting grave robbing was present in the law books by 1849, and threatened a maximum 2-year prison sentence and $200 fine, if convicted (Miller 1936). The penalty was increased to 3 years and $500 by 1898 (Wis. Stat. §4592). This would seem to indicate that grave disturbance was of some concern to the public and its representatives, but the actual impetus for the law is a matter of speculation (Miller 1936). However, unlike cities in the East with long-established medical schools, such as Philadelphia, PA, it was not until the very late nineteenth century that Milwaukee developed a medical college that found both longevity and stable enrollment in the form of the Wisconsin College of Physicians and Surgeons, which, in 1913, was absorbed by Marquette University (Miller 1936; Tallmadge 1937; Zeit 1963; Numbers 1981). Thus, while bodies for teaching purposes may have been desired, even required, by short-lived schools (Miller 1936), the larger scale, more systematic procurement of fresh cadavers was likely not in place as it had been elsewhere.

Yet, even in the absence of established medical colleges, the need for cadavers was present, and by 1850s, the Medical Society of Wisconsin actively pursued the enactment of a proper anatomy law that provided for the needs of students and physicians (Miller 1936). In 1868, "An Act to Legalize Dissection" was approved (Wis. Stat. §1437). Like other statutes of its type, it ensured that unclaimed bodies, which would otherwise be buried at state expense, would be turned over to agents of the medical society for anatomical examination. Later iterations of the act would specifically list Marquette University as the primary recipient, and place all further responsibilities, including final interment, on the school. In addition, the later versions of the act stipulated points of exemption that would prevent certain unclaimed bodies, such as those of travellers and "strangers," from being included in the practice (Jenkins 1913).

By the early decades of the twentieth century, between 10 and 30 bodies, including stillbirths, were routinely distributed for dissection by the county (Fig. 10.7). It is certainly possible that some of the bodies provided by the county for anatomical purposes were ultimately interred within the MCIG cemetery. This, then, may account for a number of the individuals who had been examined postmortem. The variation in cuts, the absent skeletal elements, and the occasionally commingled remains are what would be expected of a sample of dissection room specimens who have been anatomized and discarded, as is the case in other cemetery samples of this type. Certainly, the laminectomies, sagittally sectioned sacra, and bisected mandibles

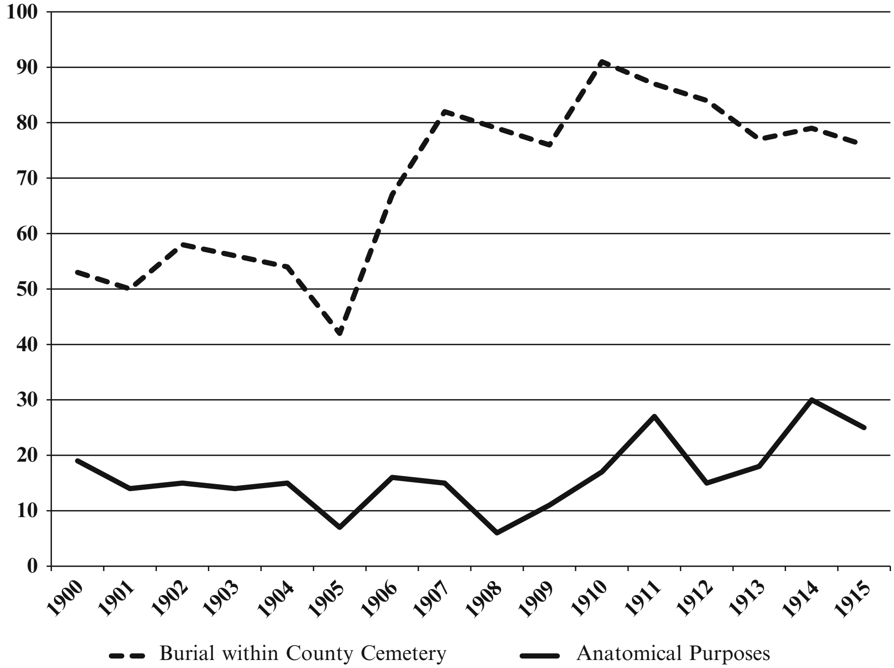

Fig. 10.7 Postmortem distribution of the Milwaukee County dead, Annual Report of the Commissioner of Health of Milwaukee, 1911–1914

are suggestive of an educational motive. In addition, the high frequency of transversely sectioned limbs, as well as the few postmortem trepanations, also alludes to an educational purpose or, at least, practicing surgical technique. However, the infrequency of associated craniotomies, which would provide students with a view of the brain, as well as the limited intrapersonal variation in forms of alteration do call this into question, and suggest that dissection for anatomical education was not necessarily the only purpose for postmortem examination.

For the MCIG sample, craniotomies are the most frequent form of postmortem alteration, and they are infrequently accompanied by any visible postcranial incisions. This suggests that those examinations were limited and purposeful, as would be expected for an autopsy. As the postmortem procedure for a complete autopsy includes opening the thorax by cutting through the costal cartilage, visible incisions of the postcranial elements need not be present. In turn-of-the-century Milwaukee, a coroner's inquest was required for any bodies that were thought to have died of either "violence or casualty," and six jurors were called upon to view and certify the cause of death (Wis. Stat. §4865 (1898)). This is further clarified by Milwaukee medical examiner, Dr. Frank J. Schultz, who wrote, "In all cases of accidental deaths, suicides, homicides, murder and deaths where no physician attended long enough to make a diagnosis and in cases where some suspicion exists … must be reported to the Coroner's Office and investigated; often an autopsy is necessary to conclusively establish certain facts …" (MCC 1937: 2). In 1917, for example, 654 deaths were investigated by the Coroner's Office, and 22 % were autopsied. Autopsies could also be performed by the Health Department. In 1915, the Bacteriology Lab was required to provide postmortem examinations for any cases referred to the Milwaukee County Health Department (MCH 1915). Given that 38 % of the individuals interred within the Poor Farm cemetery were non-institutionalized residents of the city, it is very likely that those dying from questionable circumstances were subjected to inspection by the County Coroner, who, in examining the body, sought justice and closure for those they examined.

Autopsies in the nineteenth century were not limited to the investigation of suspicious death. Autopsies were also an important part of the medical process, as they were useful for verifying diagnoses and cause of death (Ophuls 1926). In this, autopsies were, in a sense, the final act in the treatment of the patient, and, as such, were less distasteful to families than dissection (Park 2006; Crossland 2009). For the physician, the medical autopsy provided a continuing education (Hill and Anderson 1989). As Blackburn (1892: iii) wrote, the purpose of the medical autopsy was "… to cultivate a power of observation and description; to develop the practice of scientific inquiry into the patient's physical and mental condition while living, and to increase our ability to demonstrate clearly whatever lesions may be visible after death."

Moving to modernize medical science, medical institutions at the turn of the century, such as hospitals and asylums, increasingly employed autopsies to investigate the anatomical origins of physical and mental illness. For example, in his work on "necropsy" at the Royal Edinburgh Asylum, Andrews (2012) reports that the asylum pathologists would often retain deceased individuals, rather than distributing them to medical colleges, for their own investigations. The findings of examinations were typically reported, not without some pride, and their utility to science was often exhorted. Because many of the institutionalized were from the poorer classes of society, the postmortems were typically performed on individuals from families who, if present, had little power to object to the examination, or were possibly indifferent to it. As was often the case for bodies dissected in institutional settings, they were buried within public cemeteries, sometimes within shared graves, and occasionally with anatomical elements removed (Andrews 2012; Hurren 2012).

Autopsies were routinely performed at the Milwaukee County Hospital. In 1906, a formal pathology lab, an addition of "inestimable value in enabling accurate, scientific work to be done" (MCH 1906: 15) was completed on the county grounds. It contained a morgue, three laboratories, and, notably, a museum to which pathological specimens "of unusual interest" were routinely added (MCH 1906: 38). The museum served to house anatomical specimens that were unique, or of educational interest to the many students who paid for the opportunity to learn the methods of autopsy at the facilities.

In the first decade of its formal operation, nearly 100 autopsies were performed each year, some of which were at the behest of the coroner (MCH 1906). However, in 1909, only 56 were performed (Fig. 10.8). For the resident pathologist, Henry Hanson, this was "an unfortunately low number when one considers the number of patients who have died in the County Hospital during the past year and the benefits

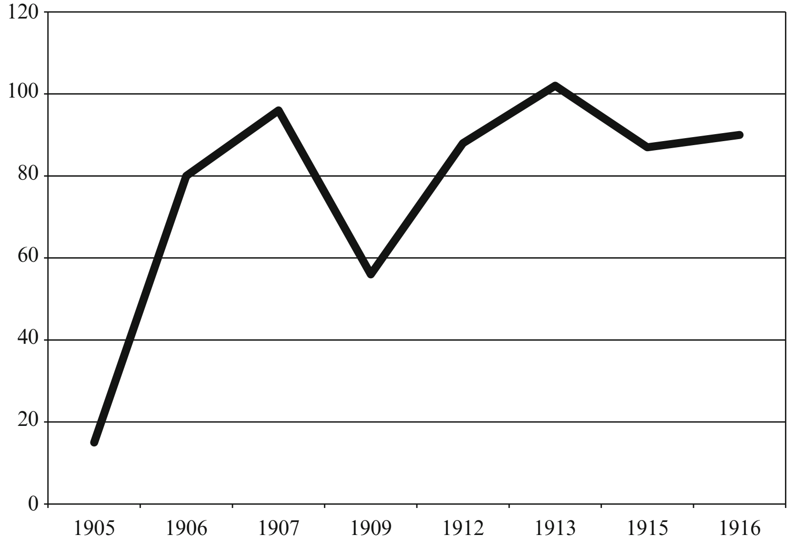

Fig. 10.8 Frequency of autopsies performed at the Milwaukee County Hospital, Annual Report of the Milwaukee County Hospital, 1905–1916

which may have been obtained from such autopsies" (MCH 1909: 110). To Hanson, the benefits were obvious. In that year alone, the "few autopsies" performed had been essential in confirming or correcting diagnoses, and had also revealed rare conditions that would have otherwise gone unnoticed. In addition, the autopsies also provided for the collection of specimens for the museum, which were reported annually, often as a point of pride. On occasion, when they were particularly unique or unusual, some of the specimens would be presented at professional meetings.

The activities of the Pathology Lab, then, represent a confluence of medical education and practice. It is not improbable that many of the postmortem alterations found among the MCIG sample are likely to have been created within its walls. The imbalance of cranial and postcranial incisions, the exploratory incisions, the repeated attempts at surgical practice, and the absent skeletal elements do suggest diverse, yet purposeful, alterations of the body that could be expected within the setting of the institution, particularly one that provided educational opportunities for students. Given the reports from the resident pathologist, the strongest link to the County Hospital may be found in the absent crania and other skeletal elements, which could be evidence for specimen collection. This is most likely the case for Burial 3039, for example, from whom the left os coxa and proximal femur had been removed. Since this individual exhibited lesions suggestive of tuberculosis, the hip specimen may have been of particular interest, perhaps illustrating a psoas abscess, or the destruction of the greater trochanter (Ortner and Putschar 1985).

Furthermore, exploratory excisions, such as those that would open the frontal sinuses or long bone diaphyses, may have been linked to anomalies that the pathologist found worthy of investigation. Notably, exploratory excisions only appeared concurrently with craniotomies in two cases. This suggests that the excisions were deliberate and specific, motivated by a singular interest. While it is impossible to know what that interest may have been, it is not hard to imagine that the pathologist, so eager to increase the museum's collection, sought out biological samples of interest to medical science.

It was in the Pathology Lab of the Milwaukee County Hospital that the lines between autopsy and dissection, investigation and education, blurred. Bodies were opened to verify or clarify cause of death, but also to provide students with opportunities to learn, explore, and discover. If the body displayed gross pathologies of particular interest, those specimens were removed, and possibly displayed. In this way, following the work of Crossland (2009), the postmortem examinations could both maintain the personhood of the individual and destroy it. The autopsy, by establishing cause of death, served as a clinical biography, as well as the final stage in patient treatment. Yet, in allowing access to students, the institution transformed the former patient into an object for teaching. Moreover, that specimens were taken during this process further served to objectify and anatomize the body. Thus, when the examination was concluded and samples were taken away for display in the museum, the body was interred altered and incomplete.

Conclusion

The Milwaukee County Institutional Grounds cemetery was the final resting place for the economically or socially unfortunate of the nineteenth- and twentieth-century city population. Before interment within the Potter's Field, certain individuals were selected for postmortem examination alteration. Previous research on similar skeletal samples has emphasized the use and abuse of the underclass by state law and medical institutions for the purpose of education and medical science. For some of the bodies buried within MCIG cemetery, this may have been the case. The dissection laws of the state of Wisconsin, as elsewhere, singled out unclaimed bodies for use by medical schools. Since the members of the underclass were less likely to have family ties, they were disproportionately at risk for selection. In the Pathology Lab of the Milwaukee County Hospital, medical autopsy became educational dissection. Failed patients, though initially examined to verify the cause of death, could just as easily be explored, sampled, and reduced to a specimen or two in the museum catalog.

Yet, not all were necessarily treated thusly. The dissected and the explored represent less than 30 % of the postmortemed sample. Far more common, however, were solitary craniotomies. This suggests that while a system was in place that utilized the underclass for medical study, the common autopsy, with the intention of identifying cause of death, was a greater motivation for the cases of postmortem alteration viewed among the institutional cemetery. This act, then, was not necessarily an opportunistic use of the poor of the city, but a medicolegal performance potentially applied to all classes. While to what degree the members of the various social classes of the city were subjected to a coroner's examination may not be known, the frequency of autopsies visible among those interred within the county cemetery may be less a reflection of social status than a reflection of the greater risk of violent, accidental, or suspicious death among the working poor (Lane 1999; Courtwright 2001; Dougherty 2011).

But in the end, whether for education or investigation, the individuals buried within the MCIG cemetery were subjected to some form of postmortem examination and analysis, likely without consent. In recent bioarchaeological research, this practice has been condemned through the ethical insight that only hindsight and reflection can bring. Yet, in condemning the physicians, students, and scientists of the past, bioarchaeologists risk condemning themselves. Recognizing parallels in the procurement, curation, and use of human remains, recent critics have described bioarchaeology as body snatching in the guise of a new science (Highet 2005; MacDonald 2006; Pobst 2013). Of course, in doing so, these critics ignore the laws and ethical guidelines that frame the bioarchaeological practice (e.g., Walker 2000; Lambert 2012; Zuckerman et al. 2014; DeWitte 2015). However, it must be acknowledged that, like the corpse for the nineteenth-century anatomist, the disinterred skeleton is the currency of the bioarchaeologist. Archaeological human remains, once removed from their disturbed graves, are dissected for the information they carry about the biological experiences of past populations (Larson 1997). To that end, they are inventoried, analyzed in occasionally destructive ways, photographed, and placed on display in publications and conferences. While some may be reburied, others remain in storage as permanent specimens for future generations of researchers and students. For the individuals buried within the Milwaukee County Institutional Grounds cemetery, the postmortem examination was only the beginning, and their interment only temporary. Their postmortem fate as body and object, skeleton and specimen, continues in the storage rooms of a Milwaukee university.

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Chapter 11
"You Couldn't Identify Your Grandmother If She Were in that Party": The Bioarchaeology of Postmortem Investigation at the Milwaukee County Poor Farm Cemetery

Patricia B. Richards, Catherine R. Jones, Emily Mueller Epstein, Nicholas W. Richards, Brooke L. Drew, and Thomas J. Zych

Introduction

At the turn of the twentieth century, Wisconsin lawmakers were attempting to legislate the difficult moral, legal, and practical issue of how, if at all, to provide aspiring doctors with opportunities to learn anatomy. Over 100 years later, an administrative law judge wrote a decision interpreting a Wisconsin Statute that determined the greatest good was served by allowing an ambitious expansion on the grounds of a regional medical complex in Wauwatosa, Wisconsin (State of Wisconsin Division of Hearings and Appeals Case No. SHS-13-001: 2013). Central to both of these events is the treatment after death of a segment of the poorest individuals residing in Milwaukee County. The ability to understand the complex relationships that determine the treatment of, and interaction with, the dead is dependent upon an understanding of the dead body itself. Materiality, embodiment, and agency are all frameworks within which bioarchaeologists attempt to explore the study of the dead body (Crossland 2009; Crandall and Martin 2014; Sofaer 2006; Tarlow 2002). Autopsies and dissections are manifestations of the embodiment of a social identity and occur within a historical and cultural context (Nystrom 2011). The process of the burial of indigents by Milwaukee County provides a rich field of enquiry to explore this and related concepts highlighting societal treatment of Milwaukee's poor.

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This research presents the historical, demographic, archaeological, and osteological evidence used to examine postmortem investigation represented among individuals from the Milwaukee County Poor Farm Cemetery (MCPFC) recovered during archaeological investigations in 2013. It is argued that the conflict inherent in anatomizing the dead and providing a proper burial produced the unique osteoarchaeological signature characteristic of the MCPF Cemetery. Potential osteoarchaeological correlates of three kinds of postmortem examination including autopsy, dissection, and medical specimen use among adults and subadults are presented.

Historical Context of the Milwaukee County Poor Farm and Related County Institutions

The practice of burying paupers on the MCPF began as early as 1853 and continued through 1974 at which time the county began to contract with private funeral homes for burial of indigents. The farm, approximately seven miles west of the city of Milwaukee in the town of Wauwatosa, was purchased in 1852 as a cost-saving alternative to providing food, firewood, and occasionally lodging for the poor and to provide an institutional setting where the needy could be provided with housing, food, and rudimentary medical care (Avella 1987). Originally called the Milwaukee County Poor Farm, rapid expansion occurred and the Poor Farm property became known as the Milwaukee County Institution Grounds. From 1852 through the 1970s (when Milwaukee County began to privatize medical facilities) a hospital, an almshouse, a children's home, a number of mental institutions, a waterworks, a fire department, and a garage all operated on the county grounds in Wauwatosa as part of the Milwaukee County Institutions Grounds complex. Only two facilities, the County Coroner's office and the Milwaukee Infirmary, remained located in the City of Milwaukee. In 1882 *The Register of Burial* at the Milwaukee County Poor Farm was begun. This ledger recorded individual interments that took place at the Milwaukee County Institution Grounds between the years of 1882 and 1974. According to the ledger, the cemetery discussed in this chapter was utilized from 1882 through 1925 and was one of the four localities used for burial on the county grounds.

Anatomy at Milwaukee's Early Medical Establishments

Milwaukee's early medical establishments were linked to the development of the Milwaukee County Institutions and historical records document the use of the Poor Farm Cemetery by these establishments. After repeated failures beginning in the 1840s, medical professionals in Milwaukee had by the turn of the century succeeded in establishing two medical colleges in the city: The Wisconsin College of

Physicians and Surgeons (WCPS) in 1893, followed by the Milwaukee Medical College (MMC) in 1894. The MMC, founded by Drs. William Earles and W.H. Nielson, was a stock company and operated independently before Marquette University adopted it in 1907. The WCPS also began as a profit-seeking venture, growing from an initial capital stock of $1500.00 to $100,000 before faculty "became more interested in […] students, than in making their stock pay dividends" in 1906 (Frank 1915:219).

As in many states at the time, these schools could rely on a state law allowing anatomical material to be taken from the nominally unclaimed bodies of poor people. Death certificates, coroners' reports, and school correspondence confirm that Milwaukee County officials gave 283 individuals to the MMC and 149 to the WCPS between 1895 and 1913. In 1895, the schools began obtaining bodies under the statute (Ch. 406, 1871) which then put, upon request, any unclaimed remains to be buried with public expense at the disposal of medical institutions for anatomical purposes, with the schools assuming the cost of transportation and "decent burial" of the body. This privilege was codified into law in 1903 (Sec. 2 Ch. 406, Laws of 1903) when both schools were specified as proper recipients for bodies from the eastern US judicial district (Wisconsin et al. 1906). MMC came to use a form letter for this purpose. Even so, demand may not have been met. If relying solely on the remains of the poor officially provided under state law for demonstrations, dissections, and anatomical specimens MMC would have had on average only 15 cadavers per year; in 1905–1906 alone there were 138 matriculates (Milwaukee Medical College, 34–35). Still, as for-profit enterprises this arrangement would have been a healthy benefit for the schools. However, in 1896, the city was horrified when a dismembered woman was found at a rendering plant, the latest in a series of incidents where medical cadavers were thrown in the trash or left in an empty lot (The Milwaukee Journal: February 1, 1896).

The process to obtain medical cadavers was straightforward. Following the law, the official in possession of an unclaimed body was to notify the appropriate medical school. If the school had need of the body, they were to request in writing its consignment. For those bodies for which an inquest had been held, the inquest document often included the official letters from the medical colleges promising to use the bodies properly and then bury them decently. The school had the body turned over to their agent, usually an undertaker, who would deliver the body to the medical school and presumably later to the County cemetery for burial. For instance, according to Henry Broegman, Milwaukee County coroner, Daniel Shea died on September 3, 1906 by falling into a ditch while intoxicated. Noting in the death certificate that the body must be delivered to a medical school for anatomical purposes, Broegman received a letter dated September 18th from William Washburn, the secretary of WCPS, requesting that Charles Judson be allowed to transport Shea's unclaimed body to WCPS for anatomical purposes according to the 1903 law. Charles Judson served as the agent specified in the law for both schools. Judson was an undertaker operating in Milwaukee as early as 1888, and was closely tied to the medical establishment throughout his career. His business partner, according to Milwaukee directories, was Fernando Mock, who graduated from WCPS and began a medical practice while continuing to work as an undertaker.

Vital Statistic and Demographic Context

The *Register of Burial* was used to generate a list of 5381 individuals buried on the county grounds between 1882 and 1925. This list facilitated a search of the Milwaukee County Coroner's Inquests. During this search it became clear that many people had been buried on the county grounds that were not listed in the *Register of Burial*. Consequently, all death certificates filed in Milwaukee County between 1882 and 1925 were checked for place of burial. This resulted in the discovery of 2095 individuals buried on the county grounds not listed in the *Register of Burial*.

While some additional cases may have been subject to postmortem procedures only those for whom both specific listing of a procedure and the purpose or location are included in the present study. Postmortem procedures are grouped into three types: medicolegal investigation, hospital inquiries, and anatomical purposes. Medicolegal investigations were carried out by the Milwaukee County Coroner's office as part of a legal death investigation. Hospital inquiries were those undertaken either to determine cause of death or as specific research by staff members of the Pathology Department located on the Milwaukee County Institution Grounds.The term anatomical purposes refers to the use of the cadaver for teaching or research.

Of the 7476 individuals documented as buried on the Milwaukee County Institution Grounds, only 5381 are listed in the burial ledger as buried in the Poor Farm Cemetery; 1627 death certificates list burial place as the Poor Farm Cemetery and an additional 468 death certificates list another cemetery on the county grounds as place of burial.

Based on documentation for individuals buried between 1882 and 1925 in the MCPFC, 1965 of the total 7008 individuals buried in the cemetery (28 %) were subject to some kind of postmortem procedure. The majority ($n=1624$) are listed as used for anatomical purposes (Fig. 11.1a). Age categories evidencing postmortem procedures reflect the overall age categories of those buried in the Milwaukee County Poor Farm Cemetery. Infants, subadults, adolescents, and young adults were less likely to be subjected to a postmortem procedure (Fig. 11.1b).

Males were slightly more likely than females (Fig. 11.1c) to have been subject to a postmortem procedure. Married individuals were slightly less likely to have been subject to a postmortem procedure also (Fig. 11.1f). Not surprisingly, in terms of cause of death, homicides make up the majority of medicolegal postmortem procedures. With regard to anatomical purposes, those listed as accident or suicide were likely also unclaimed or unidentified and the medical cause of death represents the community sick/poor for whom Milwaukee County had assumed responsibility (Fig. 11.1d). An individual was more likely to be subject to medicolegal investigation if place of death was *not* the Milwaukee County Grounds, while those used for anatomical purposes were more likely to have died in one of the Milwaukee County Institutions (Fig. 11.1g).

Overall, the historical documents suggest that medicolegal investigations were less common than anatomical use. The most common instance of medicolegal postmortem investigation involved a death that occurred elsewhere than the

a Type of Postmortem Investigation

Type of Postmortem Investigation	Number of documented cases	% of Total Burial Population(n=7008)
Medicolegal	229	3.3
Hospital Inquiries	112	1.6
Anatomical Purposes	1624	23.2
subtotal	**1965**	**28.0**

b Postmortem(Investigation(by(Age(Category

Age(Category	Medicolegal	Hospital(Inquiries	Anatomical(Purposes		Total(Postmortem(Investigation	Total(Burial(Population	%(of(Postmortem(investigation
Fetal non-live birth	10	15	138		163	704	23.2
Infant <2yrs	52	38	137		227	1500	15.1
Juvenile 2-12yrs	0	0	4		4	112	3.6
Adolescent 12-20 yrs	2	0	9		11	66	16.7
Young Adult 20-35 yrs	23	5	166		194	805	24.1
Middle Adult 35-50 yrs	83	21	467		571	1517	37.6
Old Adult >50 yrs	59	33	733		825	2304	35.8

c Postmortem Investigation by Sex

Sex (aged 12 and older)	Medicolegal	Hospital Inquiries	Anatomical Purposes		Total Postmortem Investigation	Total Burial Population	% of Postmortem Investigation
Female	12	9	153		174	650	26.8
Males	155	50	1197		1402	4129	33.9

d Postmortem(Investigation(by(COD(Category

Cause(of(Death	Medicolegal	Hospital(Inquiries	Anatomical(Purposes		Total(Burial(Population	%(
Accidents	23	0	65		432	20.4
Medical	127	109	1415		5957	27.7
Homicides	59	0	3		103	60.2
Suicides	8	0	74		286	28.7
Stillbirths	10	15	129		762	20.2

e Postmortem(Investigation(by(Some(Common(CODs

Cause(of(Death	Medicolegal	Hospital(Inquiries	Anatomical(Purposes		Total(Burial(Population	%(
Cancer	5	11	60		266	28.6
Cardiac	58	13	241		847	36.8
Syphilis	3	7	68		259	30.1
Tuberculosis	8	17	419		1133	39.2
Infectious (non-tuberculosis)	5	2	44		460	11.2
Mental Illness	3	4	175		586	31.1
Alcohol-related	11	0	66		193	39.9
Traumatic	58	0	114		542	31.7
Senile	1	1	96		384	25.5

f Postmortem(Investigation(by(Marital(Status

Marital(Status	Medicolegal	Hospital(Inquiries	Anatomical(Purposes		Total(Burial(Population	%(
Single	52	29	681		1835	41.5
Married	21	12	240		841	32.5
Widowed	9	9	260		761	36.5
Divorced	5	1	28		91	37.4

g Postmortem(Investigation(by(Place(of(Death

Place(of(Death	Medicolegal	Hospital(Inquiries	Anatomical(Purposes		Total(Burial(Population	%(
Milwaukee County Grounds	29	58	1074		4161	27.9
Non Milwaukee County Grounds	200	1	607		3481	23.2

Fig. 11.1 Demographic variables related to categories of postmortem investigation **a:** type of postmortem investigation, **b:** postmortem investigation by age, c: postmortem investigation by sex, **d:** postmortem investigation by COD, **e:** postmortem investigation by common COD, **f:** postmortem investigation bymarital status, **g:** postmortem investigation by place of death

Milwaukee County Grounds as a result of a homicide. A death that occurred at one of the Milwaukee County Institutions as a result of tuberculosis or alcohol-related causes was more likely to result in anatomical use (Fig. 11.1e). This was particularly true of single adults, fetuses, middle-age adults, or old adults.

Bioarchaeology of the Milwaukee County Poor Farm Cemetery

In 2013, Historic Resource Management Services of the University of Wisconsin-Milwaukee excavated 632 individual coffin burials from the MCPF in Wauwatosa, Wisconsin. This excavation was preceded by excavations in 1991 and 1992 at the same cemetery location that recovered 1649 individuals (Richards 1997; Milligan 2010; Dougherty 2011; Chap. 10).

The 2013 excavations resulted in the recovery of 632 coffin locations that produced a minimum of 665 individuals including 381 adults and 284 subadults (Fig. 11.2).

Provenience was maintained using a lot number system that assigned a unique identifier to an individual burial. When more than one individual or more than one set of nonindividualized human remains were present in a single coffin, individuals were, when possible, assigned individual lot numbers. This resulted in three recovery contexts: (1) a single individual in a single coffin assigned a unique lot number regardless of the completeness of the individual; (2) a "mixed" context where at least one individual was more than 50 % complete but where other remains could be individualized and assigned multiple lot numbers; and (3) a "commingled" context, where individuality was unclear and a single lot number was assigned to all remains regardless of the minimum number of individuals represented.

It has been noted that bodies in formal cemeteries associated with institutions tend to show more care in their disposal as opposed to discarded teaching collections (Blakely and Harrington 1997; Crossland 2009; Start 2002). The presence of individuals who were subject to postmortem investigation among the burials at the Milwaukee County Poor Farm Cemetery provides a unique opportunity to identify

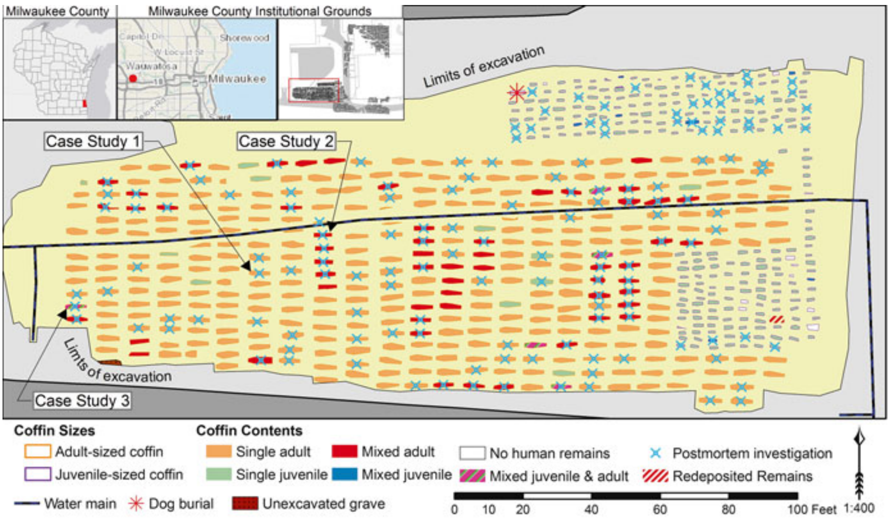


Fig. 11.2 Milwaukee County Poor Farm Cemetery 2013 excavations

the archaeological correlates of different postmortem investigations within the same historical context. Those buried at Milwaukee County expense include individuals who died as residents at one of the Milwaukee County Institutions, those who were unclaimed from the Milwaukee County Coroner's Office, and those who were anatomized by the local medical schools.

Four outcomes were possible for those who died at the Milwaukee County Institutions: (1) the body could be claimed by relatives for burial elsewhere; (2) the body could be buried at Milwaukee County expense with no postmortem investigation; (3) the body could be subject to a Milwaukee County Hospital inquiry; or (4) the body could be sent to a local medical school for use as a medical cadaver. Finally, anatomized specimens could be curated. For example, resident pathologist Henry Hanson reported to the Board of Trustees for the Milwaukee County Poor that "several very interesting specimens have been added to the museum over the past year, increasing our collection to over 275 gross anatomical specimens" (Hanson 1909:110).

Methods

Sex determination of adults was based on the scoring of cranial and postcranial metric and nonmetric traits in accordance with established methods (Acsádi, and Nemeskéri 1970; Milner 1992; Phenice 1969; Steele 1976; Stewart 1979; Walker 2005). Age estimates for adults were based on the scoring of nonmetric traits of the cranium and innominate in accordance with established methods (Brooks and Suchey 1990; Lovejoy et al. 1985; Meindl and Lovejoy 1985; Osborne et al. 2004; Todd 1920, 1921). Established age categories for adults include the following, young adults (20–34.9 years), middle adults (35–49.9 years), and old adults (50 years or older).

The subadult age estimation process included three distinct assessments, beginning with an evaluation of primary element development and epiphyseal fusion (Scheuer and Black 2000; Schaefer et al. 2009). The second and third age assessments focused on dental development (Lysell et al. 1962 as described in Scheuer and Black 2000; Moorrees et al. 1963; Sunderland et al. 1987; Ubelaker 1989) and overall growth (Frazekas and Kósa 1978; Maersh 1970). The first assessment provides the most general results while the second two assessments result in grouping those younger than 2.5 years into finer grained developmental categories. Established age categories for subadults include the following: fetal (less than 40 gestational weeks); neonate (first 4 weeks/28 days postnatal); infant (9 days–11.9 months); toddler (12 months–2.49 years); early childhood (2.5–5.9 years); late childhood (6–12.9 years); and adolescents (13–19.9 years).

Analysis of postmortem intervention among adults focused on identifying marks on bone associated with various medical practices that fully section the bone, as well as kerfs, or grooves, and scratches associated with these incisions. Care was taken to ensure differentiation between sharply angled, smooth-walled incisions made by cutting instruments and the curved, caved, and jagged variety of cuts that can be made by excavation tools and postmortem fracture (McFarlin and Wineski 1997). Contemporary medical manuals (Delafield 1872; Delafield and Prudden 1904; Hektoen 1894) were consulted in order to correlate cut marks with contemporary procedures.

Assessment of subadults focused on recording the specific locations of evidence for craniotomy as well as noting any osseous indicators of the tools used in the procedure. Skeletal modification produced by knives versus that produced by saws was used to deduce the two basic categories of tools. Metal knives used to cut soft tissue will leave well-documented "V-shaped" grooves or cut marks if the blade is drawn across the bone (Walker and Long 1977:608–609). Perforators and craniotomes are different types of saw blades. Saw blades produce longer kerfs in bone that are more consistent than knife cuts and the saw blade teeth produce regular striae along the kerf walls (Symes and Chapman 2010). Retractors and elevators used to ply cut bone sections away from the rest of the neurocranium may leave indentations in the bone similar to those marks left by the blunt edge of a knife blade (Smith et al. 2003).

Results

Established Categories of Postmortem Investigation

In order to evaluate the types of postmortem examination represented in the Milwaukee County Poor Farm Cemetery burials, an osteoarchaeological profile was constructed based on historical research and laboratory analysis for each of the three different categories: legal autopsy, dissection, and medical specimen use. It is important to note that these three categories are not mutually exclusive.

Markers of legal autopsy are determined by the presence of one or more of the following osteological markers: craniotomy; cross-sectional cuts to the body or sternal end of multiple ribs, sometimes accompanied by perimortem breakage of the body or neck of the bones when the rib cage is pried open; and severing oblique cuts to multiple bones of the vertebral column, the result of turning a body to its anterior side and cutting the spinal column free of the surrounding tissue. Individuals are generally found articulated within the coffin. Archaeologically, single lots, six-sided coffins, and little evidence for the disposal of medical waste in the coffin characterize autopsied individuals. Fig. 11.3 illustrates Burial lot 10765 (case study 1 in Fig. 11.2), a potential example of legal autopsy.

Dissection can be determined by the presence of one or more of the following osteological markers: cross-section cuts to one or more postcranial elements, sometimes accompanied by superficial scratches, kerfs, and breakaway spurs on the bones; and extraneous cuts to the cranium which are not associated with craniotomy.

Fig. 11.3 Burial Lot 10765. Case Study 1 on Fig. 11.2. UWM-ARL Image 2013.001.10765.1

Fig. 11.4 Coffin Lot 10751, Burial Lot 11038. Case Study 2 on Fig. 11.2. UWM-ARL Image 2013.001.10751.1

Dismemberment, with no attempt to reassociate elements anatomically, is characteristic, as is the presence of sets of elements including legs or arms as well as knee, ankle, and elbow joints. Archaeologically, mixed lot contexts, either rectangular or six-sided coffins, and the presence of medical waste in the form of bottles, X-ray equipment, test tubes, broken glass, and other miscellaneous items placed in the coffin are associated with dissected individuals in the cemetery. Fig. 11.4 illustrates Burial lot 11038 (case study 2 in Fig. 11.2), a potential example of dissection.

The curation of medical specimens is inferred from the absence of the skull with or without associated cuts to the cervical vertebrae, or the very specific instance of a jar containing the remains of two subadult individuals. Archaeologically, discarded medical specimens were recovered from both rectangular and six-sided coffins that were often unusually stained and included quantities of medical waste. Fig. 11.5 illustrates Burial lot 10971 (case study 3 in Fig. 11.2), a potential example of medical specimen disposal.

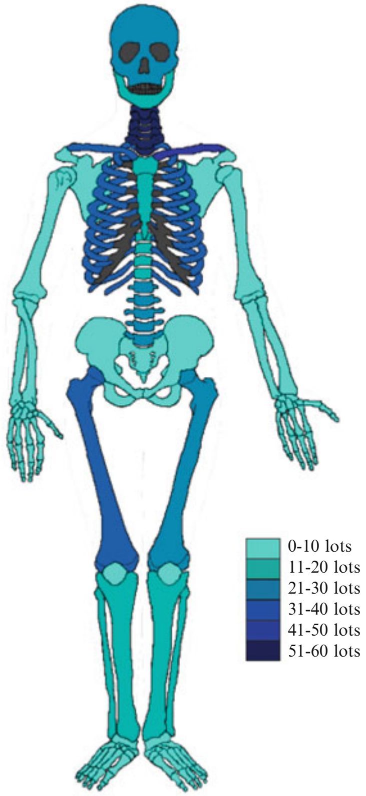
Fig. 11.5 Burial Lot 10971. Case Study 3 on Fig. 11.2. UWM-ARL Image 2013.001.10971.1

Results of Adult Analysis

Of the 381 adult lots analyzed, 176 exhibit craniotomy or cut marks of some type. Mixed and commingled contexts account for 64.2 % (113) of these, and single contexts account for 35.8 % (63). Slightly more than half are males (98) and 11 are female. Middle adult is the most common age category represented at 32.4 % (57).

Cut marks are present on each element of the adult human skeleton. Cervical vertebrae are the most common bones exhibiting cut marks that are either superficial or of full thickness and are present in 31.2 % (55) of lots with cut bones (14.4 % of total lots). Cut cervical vertebrae are the only bones exhibiting cut marks in 13 of these 55 lots (23.6 %), suggesting that the only postmortem investigation was removal of the skull prior to burial (Fig. 11.6). Lot 10792 is the only single adult lot with cut cervical vertebrae and is unusual in that the cut runs obliquely through C1 to C3. Clavicles are the next most numerous, with severing cuts present in 29.5 % (52) of lots with cut bones (13.6 % of total lots). A similar pattern was observed on dissected individuals from the Newcastle Infirmary and the Royal London Hospital Cemeteries in England (Mitchell et al. 2011). All cut clavicles were recovered from mixed lots; no single adult lot exhibits a cut clavicle. Although autopsy manuals of the time do not explicitly recommend severing the clavicle at midshaft, its removal would facilitate investigation of the chest cavity and especially removal of the heart and organs of the neck (Hektoen 1893; Delafield and Prudden 1904; Miller 1914). Other bones in order of prevalence include the femur (43, or 24.4 %) and ribs (33, or 18.8 %). Overall, surface cuts and false-start scratches were minimal outside of craniotomy cuts, suggesting that the bones were not defleshed prior to cutting. Very few lots suggest osteological dismemberment by individuals with anatomical training. Typically, this results in a pattern in which limbs are disarticulated near the joints and scratches or small kerf marks are visible near articular surfaces. Instead, the majority of lots were dismembered by limb bisection, in which severing cuts are made near the joints, long bones are detached in the proximal and distal thirds (especially at the elbow and

Distribution of Postmortem Cut Marks Throughout the Skeleton



CERVICAL VERTEBRAE	%	N
PMI	31.8	55
Autopsied	1.2	2
Dismembered	23.1	40

CLAVICLE	%	N
PMI	30.1	52
Autopsied	0.6	1
Dismembered	19.7	34

THORACIC VERTEBRAE	%	N
PMI	10.4	18
Autopsied	1.2	2
Dismembered	5.2	9

FEMUR	%	N
PMI	24.9	43
Autopsied	0.6	1
Dismembered	18.5	32

LUMBAR VERTEBRAE	%	N
PMI	12.7	22
Autopsied	0.6	1
Dismembered	8.1	14

TIBIA	%	N
PMI	13.3	23
Autopsied	0	0
Dismembered	9.8	17

RIBS	%	N
PMI	19.1	33
Autopsied	1.2	2
Dismembered	12.7	22

HUMERUS	%	N
PMI	9.8	17
Autopsied	0	0
Dismembered	8.7	15

- Numbers reported above reflect the bones most commonly affected by postmortem cut marks in the study; vertebrae were considered one category but have been broken out here into subcategories for clarity
- % above is out of total lots with marks of postmortem intervention minus those with only evidence of trepanation, n=173

Fig. 11.6 Distribution of cut marks

knee), and the feet and hands are severed at ankle and wrist (Reichs 1998). This does not represent the extent of intervention; many bones showed multiple severing cuts in various locations and angles, and cuts were not reserved for the long bones and limbs, but could affect nearly every bone in the body, including the scapulae, innominates, and patellae.

Of the adult lots where the evidence suggests legal autopsy (51), 31.4 % (16) exhibit clear craniotomies accompanied by cut marks to the ribs and vertebrae (Fig. 11.7c). This number may be an underestimate, as many lots contained ribs and vertebrae that were too fragmented to evaluate for cut marks.

Evidence of dissection can be seen in 32.8 % (125) of the analyzed adult lots. Included are cross-sectional cuts to the postcranial bones, especially to the midshaft of the clavicle and the femur, and to the basicranium. This includes 95 lots (Fig. 11.7d) exhibiting evidence for dismemberment and 30 lots with evidence for craniotomy and cuts to the postcranial skeleton including ribs, vertebrae, and sternum.

a Adult Postmortem Investigation: n=133
*Does NOT include 43 comingled lots

	Male	Female	Indeterminate	TOTAL	% of 133	% of 381
Young	12	1	1	14	10.5	3.7
Middle	46	3	8	57	42.9	15.0
Old	23	5	2	30	22.6	7.9
Indeterminant	17	3	13	32	24.0	8.4
TOTAL	98	11	24	133	**100**	**34.9**
% of 178	74.0	8.0	18.0	**100**		
% of 431	25.7	2.9	6.3	**34.9**		

Single Individual Lots	63
Mixed Individual Lots	70
Commingled Lots	43
Total	176

b All Craniotomy: n=67

	Male	Female	Indeterminate	TOTAL	% of 67	% of 381
Young	6	0	1	7	10.4	1.8
Middle	25	0	5	30	44.8	7.9
Old	10	1	2	13	19.4	3.4
Indeterminant	11	2	4	17	25.4	4.5
TOTAL	52	3	12	**67**	**100**	**19.0**
% of 67	77.6	4.5	17.9	**100**		
% of 381	13.6	0.8	3.2	**17.6**		

Single Individual Lots	50
Mixed Individual Lots	17
Total	67

c Autopsy Standards Met: n=49

	Male	Female	Indeterminate	TOTAL	% of 49	% of 381
Young	2	0	0	2	4.0	0.5
Middle	18	0	5	23	47.0	6.0
Old	8	0	2	10	20.4	2.6
Indeterminant	11	1	2	14	28.6	3.7
TOTAL	39	1	9	**49**	**100**	**11.8**
% of 49	79.6	2.0	18.4	**100**		
% of 381	10.2	0.5	2.4	**12.9**		

Single Individual Lots	44
Mixed Individual Lots	5
Total	49

d Dismemberment Markers: n=65

	Male	Female	Indeterminate	TOTAL	% of 65	% of 381
Young	6	1	0	7	10.8	1.8
Middle	20	3	3	26	40.0	6.8
Old	13	4	0	17	26.2	4.5
Indeterminant	6	0	9	15	23.0	3.9
TOTAL	45	8	12	**65**	**100**	**21.8**
% of 65	69.2	12.3	18.5	**100**		
% of 381	11.8	2.1	3.1	**17.1**		

Single Individual Lots	12
Mixed Individual Lots	53
Total	65

Fig. 11.7 Postmortem investigation—adults **a:** adult postmortem investigation, **b:** all cariotomy, **c:** autopsy standards met, **d:** dismemberment markers

Indicators of medical specimen retention overlap with those typical of dissection but are likely represented by 54 lots showing postmortem intervention marks but missing the skull, 33 lots exhibiting cut marks on the cervical vertebrae and no cranium, and 2 lots representing preserved subadults.

Fig. 11.8 compares the results of the osteological analysis (cemetery) to demographic data (demographics). Both data sets include evidence for fewer legal autopsies when compared to dissections.

Results of Subadult Analysis

Total number of subadult individuals analyzed is 284. Evidence for postmortem intervention on subadult postcranial skeletal elements was not observed; consequently this study is limited to 33 subadults exhibiting evidence for craniotomy.

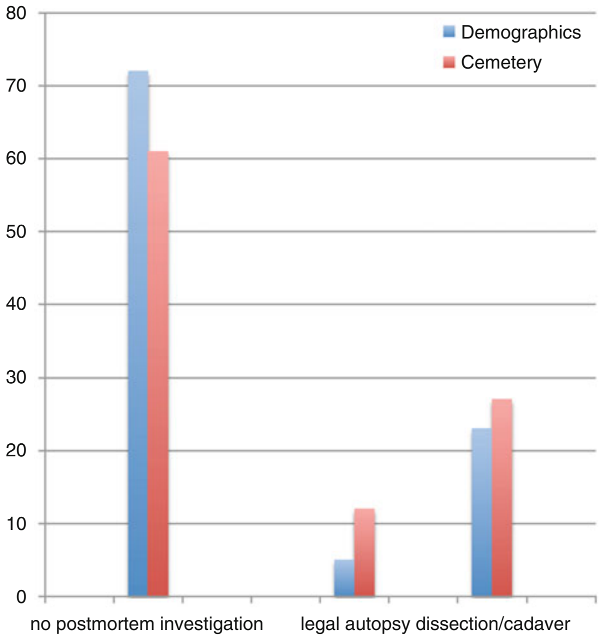


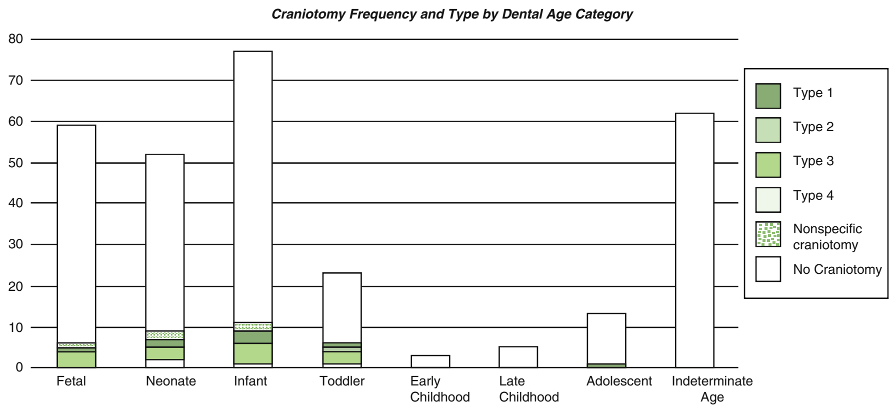
Fig. 11.8 Comparison of demographic and osteoarchaeological data

The 33 subadults exhibiting evidence for craniotomy represent 11.3 % of the subadult population. No individuals of early or late childhood age exhibit evidence for craniotomy; all other dental age categories include individuals with evidence for craniotomy (Fig. 11.9). As a percentage of each age category 10.7 % of the fetal ($n=6$), 17.3 % of the neonates ($n=9$), 14.3 % of infants ($n=11$), 19 % of toddlers ($n=4$), and 14.3 % of adolescents ($n=2$) exhibit craniotomies.

Craniotomy Types

Type 1 craniotomies (Fig. 11.10) exhibit saw marks and match the adult-style craniotomy. A saw was used to remove the calvarium in a transverse plane, affecting the frontals, parietals, occipital, and, at times, temporals. Older individuals may exhibit striae on kerf walls, and exhibited long and regular cuts that compare favorably with saw marks.

Type 2 craniotomy is represented by a single infant (Lot #10,132). Lytic lesions were observed on the frontal bones superior to the brow ridge. Evidence of craniotomy was observed on the occipital and parietals. The incision is not near the crania lesions. The relatively short length of the cut did not facilitate identification of instrument type.



Identified Lesions and/or Pathology in Individuals Exhibiting Craniotomy by Dental Age Category

	Fetal	Neonatal	Infant	Toddler	Adolescent
Lytic	X	X	X		
Blastic	X	X	X		
Abnormal cranial morphology	X	X	X	X	X
Porotic hyperostosis			X	X	
Cribra Orbitalia	X		X	X	
Abcess				X	

Fig. 11.9 Craniotomy frequency and type by subadult age category

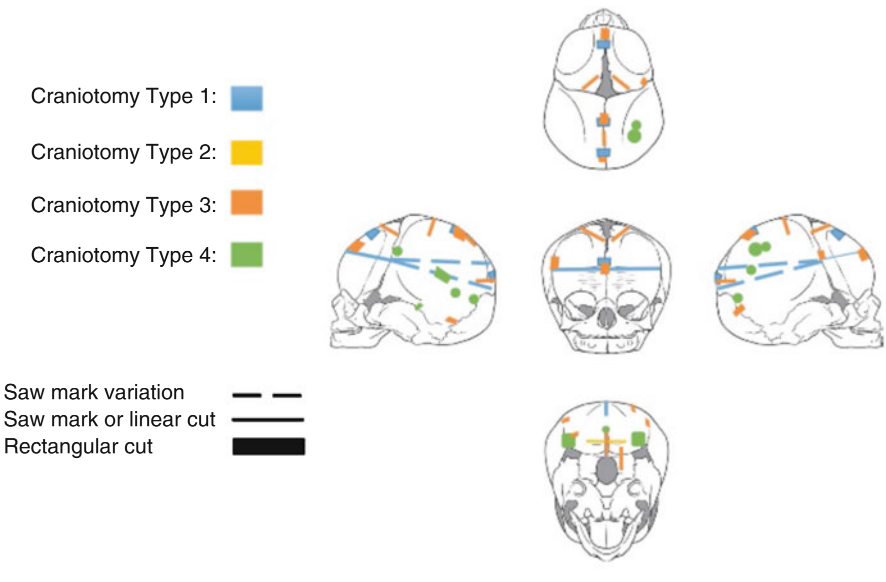


Fig. 11.10 Craniotomy types

Type 3 craniotomy is identified by rectangular cuts or indentations to neurocranial elements. The cuts appear to be the result of metal knife use.

Type 4 craniotomy consists of laterally placed burr holes or cutout perforations, made with metal saws and knives, respectively.

Nonspecific craniotomy (not illustrated) is the last type of craniotomy and represented by cranial elements with what appear to be cut marks but where no specific location could be identified.

Frequency of Craniotomy Types by Dental Age Group

The most common craniotomy is Type 3, followed by Type 1, nonspecific craniotomy, Type 4, and Type 2, respectively. All age groups exhibited Type 3 craniotomies, but those of infant and fetal age exhibited more Type 3 craniotomies, respectively, than the other age groups. Metal elevators used to pry open cranial elements may be responsible for rectangular cut marks observed along suture lines. The presence of Type 1 craniotomies among fetuses and neonates is interesting since cranial elements are so thin. Craniotomy Type 4 was observed among the neonatal, infant, and toddler age categories. Again, neonates and infants exhibiting Type 4 craniotomies is interesting given the thin nature of their cranial elements. A single Type 2 craniotomy was identified on a toddler (lot# 10132).

Crania Exhibiting Abnormal Morphology and/or Pathological Lesions

All subadults with craniotomy exhibited pathological lesions or abnormal cranial morphology except one toddler-aged individual (Lot #10131). Infants, neonates, fetuses, toddlers, and adolescents, in that rank order, exhibited pathological lesions and/or abnormal cranial morphology in addition to exhibiting evidence for craniotomy. Proportionally, this compares favorably with the segment of the subadult population lacking evidence for craniotomy, with the exception of the childhood-aged groups. All eight childhood-aged individuals recovered from the MCPFC exhibit pathological lesions and/or abnormal cranial morphology, and yet none were subjected to postmortem craniotomy.

Discussion and Conclusions

The 1894 Milwaukee County Rules and Regulations for the County Farm and Almshouse include Rule 17:

> The Superintendent shall keep a record of all pauper burials on the County Farm, file all burial permits, and place a painted and numbered head board at each grave, which grave shall, in no case be less than six feet deep. The burial record shall specify the name of the

deceased, date and cause of death, number of burial permit and the number of the grave in which buried. It shall be the duty of the Superintendent to see that the cemetery is kept in decent order.

Despite this rule, records were clearly not kept for all of the individuals buried in the cemetery as evidenced by individuals whose death certificates list the County Cemetery as place of burial but for whom there is no listing in the *Register of Burial*.

Further, if, as permitted by law, an individual who was to be buried at Milwaukee County expense was instead claimed by one of the medical schools for anatomical purposes it was the school's responsibility to assume the cost of transportation and "decent burial" of the body.

Prior to the enactment of this law confusion surrounded the burial of the poor as evidenced by the reporting of the investigation into the action of Undertaker Judson. From February through March of 1894 the Milwaukee Journal published a series of articles focused on an investigation into the activities of Undertaker Charles Judson. Judson & Co. had a contract with the Milwaukee County Board of Supervisors to provide coffins and burial services for the Milwaukee County Poor Farm. The articles note that exhumations had revealed incorrect identification of buried individuals, an alleged financial relationship between Judson and the medical colleges, and several instances where Judson took County payment for burials that never took place. The accounts include a dramatic description of Judson hiding from authorities. Ultimately, Judson was tried and convicted of perjury. Two additional points are notable in this set of newspaper articles. The first is that the investigative committee recommended, "the contract system of burying paupers be abolished. That bodies be buried by the superintendent of the county farm, who shall furnish all coffins" (Milwaukee Journal: February 13, 1884). The second is the testimony of several physicians of the Wisconsin Medical College. The testimony reveals the attitude of some late nineteenth-century medical professionals towards those being used for anatomical purposes. The following statement of a Dr. Burgess who attempted to explain why he didn't feel it was worthwhile to return the anatomized bodies for burial illustrates this. Dr. Burgess opined that it was an injustice to the institution and its students to require that bodies be given up before the students had completed their training and that "besides you couldn't identify the bodies if you wanted to, they are so mutilated and so disfigured … you couldn't identify your grandmother if she were in that party. After those bodies have been pickled and cut up and operated upon by a class of students, you can't tell one from the other" (Milwaukee Journal: February 16, 1894).

The inherent conflict in the anatomization of individuals, the constraints of Milwaukee County budgets, and the prevailing sense of a "proper" or "respectful" burial are replicated over and over again in the MCPFC. Common to every burial is the excavation of a single burial shaft and interment in a coffin. This practice allowed the Milwaukee County Board of Supervisor's program of County-funded burials to maintain the appearance of individuality in death. However, variability in burial practices including multiple individuals in a single interment, comingling, curation of skulls, and groupings of similar elements resulted in a hidden but nonetheless very real loss of individuality.

Despite the efforts of Milwaukee County to create a monolithic category of "pauper" buried in the Milwaukee County Poor Farm Cemetery, this research has demonstrated that:

1. Many more people were buried in the Milwaukee County Poor Farm Cemetery than are recorded in the *Register of Burial at Milwaukee County Poor Farm 1882–1974*.
2. Based on the archaeological data, despite legal prohibition, more than one individual was buried in a single coffin. In some instances, these were not "individuals" but the anatomized remains of multiple people.
3. Early local medical schools relied heavily on both the living and dead poor and could generally be described as unprofessional and arrogant in their approach to acquisition and disposal of bodies despite public outcry.
4. The relationship between the Milwaukee County Board of Supervisors, the contracted undertakers, and the local medical schools contributed to inconsistent and unethical practices.
5. The presence of midshaft severing of the clavicle can be used to distinguish dissection from autopsy. The demographic evidence for autopsy and dissection compares favorably with the osteoarchaeological evidence when the osteological parameters established here for autopsy and dissection are used.
6. The overwhelming majority of subadult individuals with evidence for autopsy also exhibit lesions indicative of infection, illness, or abnormal development. This may suggest that the postmortem investigation of subadults was the result of autopsy and not dissection.
7. A category of medical specimen use was defined based on historical documentation. Osteoarchaeological markers include lack of a skull, evidence for cervical cuts along with lack of a skull, and prepared specimens in a jar.

The bioarchaeological data from the Milwaukee County Poor Farm Cemetery speaks poignantly to the manipulation of the body as it relates to perceived social identity. The poor were almost exclusively chosen for dissection and the individuals who were autopsied and buried were part also of the poor or unidentified community. Thus, simply being buried in the Milwaukee County Poor Farm Cemetery is a marker of social identity. The concept of selective postmortem investigation, as argued elsewhere (Halperin 2007; Richardson 2000; Sappol 2002; Nystrom 2011), is useful when considering modification of the body. However, the practices of autopsy, dissection, or medical specimen use were not intended for public display, and therefore did not serve as markers of social identity. The Milwaukee County Poor Farm Cemetery coffin burials of "individuals" and their marking on the landscape in the Cemetery provided the social identity of "individual pauper" as understood by the broader community.

Consequently, it is only through analysis of postmortem investigation that the bodies buried in the Milwaukee County Poor Farm Cemetery can be understood as the location of embodied agency. The manipulation of social identity by Milwaukee County represented by a line in a register or a marked location on the ground is revealed through the agency of the embodied experience of postmortem investigation. And while the dead bodies of the Milwaukee County Poor Farm might have no direct agency, clearly they, regardless of whether they were legally autopsied, anatomized, or used as medical specimens, influenced how they were buried. The puzzle of why the effort was made to bury anatomized parts in a coffin in a cemetery is perhaps best understood as the result of conflicting ideas of personhood, poverty, and respectful treatment.

In recent decades, economists and social theorists have vigorously debated the notion that the poor suffer from a "poverty of aspirations" (Appadurai 2004). In the case of the Milwaukee County Poor Farm Cemetery, it was likely not a lack of aspirations on the part of either the interred poor or those responsible for their burial that produced the archaeological record described in this study. Rather, it was the hidden practices of anatomizing individuals while appearing to follow legally legislated, humane burial practices that negated the aspirations so evident in Milwaukee County's Rule 17.

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Chapter 12
"The Mangled Remains of What Had Been Humanity": Evidence of Autopsy and Dissection at Philadelphia's Blockley Almshouse, 1835–1895

Thomas A. Crist, Douglas B. Mooney, and Kimberly A. Morrell

Introduction

In September 1883, newly graduated doctor Arthur Ames Bliss began his 1-year residency at the Blockley Almshouse, at that time officially called the Philadelphia Almshouse and Hospital. Opened 50 years earlier, "Old Blockley" was the center of clinical education for hundreds of aspiring physicians who attended Philadelphia's prestigious medical schools, but was now under investigation for its poor management, inadequate care, fraud by its superintendent, and years of "body snatching" from its cemeteries.

Thirty years later, Dr. Bliss discovered his journal from his "Blockley Days" and completed editing it shortly before he died. His account evokes a caring and humane depiction of the patients he served, "outcasts and beggars and weaklings … longing for some place of refuge" who found themselves languishing with 2000 other inmates at the sprawling almshouse (Bliss 1916:15). It is his more scientific descriptions, however, of the dissections and autopsies that he performed in Blockley's "dead-house" that provide unique insights into the source of the thousands of skeletal remains discovered in the former almshouse cemetery during construction activities in early 2001. Writing about his autopsy and dissection of his patient "Edmunds," Dr. Bliss vividly sets the scene:

> In one corner of the room … was a roughly made, unplaned coffin with shavings for a pillow. In this the mangled remains of what had been humanity was to be carried to the

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> Pit or Potter's Field, and there hidden away under the ground … in the ash heap (Bliss 1916:29–30).

The unfortunate Mr. Edmunds and many hundreds of his fellow inmates, as they were then called, were literally buried in a cemetery and ash dump located across the road from the almshouse's front façade. Together with documentary evidence, thousands of commingled bones with cut marks and associated artifacts excavated in 2001 after their discovery during construction activities indicate that the cemetery was used between ca. 1865 and 1895 to bury body parts, surgical waste, and the autopsied and dissected remains of patients from the Blockley morgue. Among the American notable medical pioneers who contributed to producing these human remains were physicians William Osler (1849–1919), the "Father of Modern Medicine" and resident physician from 1885 to 1889, and Elizabeth Blackwell (1821–1910) who interned at Blockley in 1848 and the following year became the first woman in America to earn a medical degree.

The human skeletal remains excavated from the Blockley Almshouse Cemetery collectively embody the social identify of the marginalized people of postbellum Philadelphia, and also reflect the larger history of what medical historian Michael Sappol (2003:75) has named the "anatomical era of American medicine." Indeed, in his study of early Philadelphia's poor, Newman (2003:9) noted that in the prisons, hospitals, and especially the almshouse the city's leaders and the elite sought to "classify and regulate impoverished bodies, often by means of discipline and incarceration … medicalizing bodies thus constituted an exercise in social power." Viewing the impoverished bodies as texts enhances the understanding of "how class, social power, and personal identity were lived and experienced" in early Philadelphia. Similarly, Sappol (2003:322) underscores that to even the poorest members of society, "how one's body was treated after death was a performance that fixed one's moral, aesthetic, and social status." The importance of burial in a coffin with a grave marker could not be overstated: "death in the poorhouse … followed by dissection in an anatomical theater or display in an anatomical museum, was a punishment that commented on the life … a posthumous torture, a secular hell." Likewise, Andrews (2012:22) notes that as medicine became more scientific during the Victorian period, "considerable professional pressure was exerted to convert deceased asylum patients into mere pathological artefacts, serving mental science's higher goals of knowledge production."

The performance of autopsies and dissections comprises both practical and symbolic aspects. Absent modern imaging technology, the action of systematically cutting into corpses and separating their parts following a standard set of instructions provides the means to determine causes and manners of death in the medicolegal setting via the autopsy. Aspiring healthcare professionals learn to differentially diagnose diseases, practice surgical techniques, and treat patients through gross observation at the dissecting table. Symbolically, to medical students both of the past and present, human dissection represents a rite of passage, the entry point into the rarified company of physicians, surgeons, and other healthcare providers (Giegerich 2001; Warner and Edmonson 2009). The industry of dissection, however, has long involved a wider array of actors including politicians, lawyers and judges, religious leaders, educators, funeral providers, journalists, authors, and members of the public. The cumulative results of their voices and influences echo throughout the human remains boxed up at the Blockley Almshouse and buried together in the ash dump situated within view of its main entrance, a neoclassical edifice whose imposing columns masked the abuse and exploitation that occurred inside. The purpose of this chapter, then, is to address the patterns of autopsy and dissection identified among the inmates' remains using a biocultural approach that emphasizes the concepts of structural violence (Farmer et al. 2006; Nystrom 2014), abnormality (Alberti 2011; Kohlstedt 1988; Miles 2004; Worden 2002), and marginalization (Andrews 2012; Philo 2012) as they were applied to the corpses of nineteenth-century Philadelphia's most vulnerable residents.

The Philadelphia Almshouses and Early American Medical Education

Beginning in the colonial period and extending into the nineteenth century, the concepts of hospitals, medical education, and patient treatment followed similar, connected paths of formalization and Philadelphia, established in 1682, lay at the center of these developments. During the first half of the eighteenth century, hospitals that were privately supported and controlled by a self-appointed group of socially prominent citizens (called voluntary hospitals) were opened in colonial almshouses and workhouses following the British model; these later became publically supported institutions staffed by physicians where medical students paid to attend lectures and observe dissections. They also served as a steady source of the cadavers needed for use in the anatomy courses offered by medical schools which began to proliferate at this time.

Medicine in this period was loosely organized into four categories: treatment, surgery, pharmacy, and midwifery (Starr 1982; Stevens 1998). Even after the opening of the first medical school in the colonies in 1765 at the College of Philadelphia (now the University of Pennsylvania), American medical students served apprenticeships in a parochial, unregulated system that varied greatly by region. Students who desired university medical degrees studied in Europe, especially at the University of Edinburgh in Scotland which had established its faculty of medicine in 1726. Indeed, the first faculty members at the College of Philadelphia's medical school were Edinburgh graduates (Stevens 1998). They consequently designed their curricula following the Edinburgh model of education which emphasized human anatomy based on lecture demonstrations, student dissections of corpses, the use of prepared anatomical specimens, and clinical observation of patients in hospitals (Chitnis 1973; Rosner 1992). It was not until 1852, however, that the American Medical Association standardized medical education nationally.

With respect to its role in early American medical education, Philadelphia is a city of firsts. In 1730, Dr. Thomas Cadwalader (1707–1779) presented the first documented medical lectures and dissections in the colonies. In 1751, Benjamin

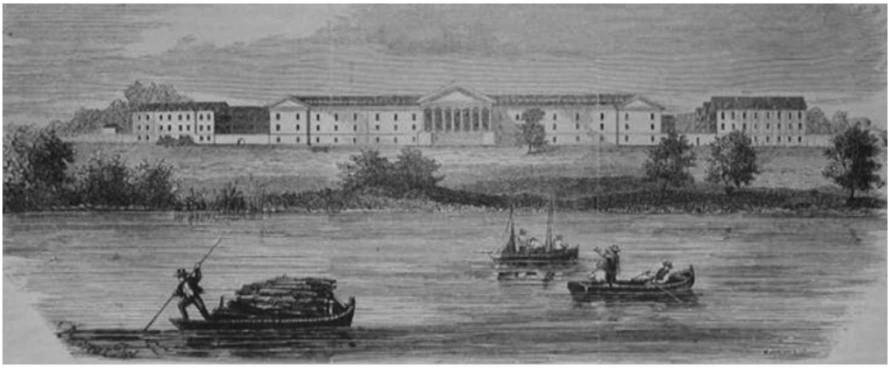

Fig. 12.1 Woodcut of the Blockley Almshouse in 1853 from *Gleason's Pictorial Drawing-Room Companion*. The cemetery site was located in the open field at the *far left* of the image

Franklin helped to establish the first hospital in America (Pennsylvania Hospital) where the colonies' first medical museum, library, and surgical amphitheater all were located (Henry 1897; Williams 1973). In 1765, physicians William Shippen, Jr. (1736–1808) and John Morgan (1735–1789) opened the colonies' first medical school, initiating the regular dissection of the bodies of criminals and people who had committed suicide supplied by the coroner.

Predating the Pennsylvania Hospital by 20 years, the Philadelphia Almshouse opened in 1731 and was the first such institution in the colonies. It included an infirmary that in 1835 was officially named the Philadelphia Hospital (Croskey 1929; Lawrence 1905; O'Donnell 2005). The first two almshouses were located in the center of Philadelphia near Independence Hall but later concerns with overcrowding, unsanitary conditions, and its negative effect on city property values led in 1830 to construction of a new expansive almshouse complex on a 187-acre property located two miles away in Blockley Township on the west side of the Schuylkill River (Fig. 12.1). Effectively isolating the sick poor and other marginalized Philadelphians, the new institution comprised included quarters for 1750 paupers, an asylum for 400 children, and a hospital capable of treating 600 patients (Croskey 1929; Hunter 1933; Lawrence 1905). Recognizing the growing role of the hospital in contributing to the "just reputation which Philadelphia enjoys for furnishing the best and most copious means of medical instruction in the United States," the new building was designed to "have a lecture room sufficient to hold 500 students" and "a dead room and another for post-mortem examinations, etc." (Lawrence 1905:85, 90). The first group of 1081 residents were moved into the new almshouse in July 1834. Thousands would follow them over the next seven decades.

When it opened, the city's Board of Guardians adopted the name "Philadelphia Hospital" for the almshouse's medical department; this name was changed to the "Philadelphia General Hospital" in 1902 as the almshouse system was replaced by facilities that were both physically and bureaucratically separated (Hunter 1933; Rosenberg 1982). Within 10 years of its opening, the almshouse hospital had become central to medical education in the city. For example, the University of Pennsylvania Medical School required all of its students to attend "one course of Clinical Instruction in the Philadelphia Hospital, (Blockley,) or the Pennsylvania Hospital" to earn their medical degrees (Medical Faculty of the University of Pennsylvania 1841:32). By 1845, the Philadelphia Hospital was staffed by four resident physicians and four surgeons, each appointed for 1-year terms. A report by the Board of Guardians that year noted that the physicians were "connected with the medical schools of the city as Professors or Lecturers, and for about 4 months of the year attend regularly at the Hospital, for the purpose of lecturing to their classes." (Lawrence 1905:156). Thousands of medical students subsequently passed through the halls of "Old Blockley" during the second half of the nineteenth century; indeed, in 1893 Curtin (1893:4) estimated that between 15,000 and 20,000 students had attended lectures in the almshouse clinic room over the previous 30 years.

Autopsy, Dissection, and the Blockley Pathological Museum

The thousands of medical students at Blockley benefitted from a steady supply of patients who first served as the subjects of bedside clinical instruction and often later as the source of anatomical specimens to be used for dissection and surgical practice. The Philadelphia Almshouse's Board of Managers first allowed medical students to "practice in the House" in 1788 and, by the time the Blockley Almshouse had opened, hundreds of students from the University of Pennsylvania and Jefferson Medical College (founded in 1824) were paying to attend classes and observe autopsies, dissections, and surgeries performed by the resident physicians (Lawrence 1905:35). The students quickly realized that the patients' bodies provided an easy source of specimens for their own dissections and illegally procured them directly from the almshouse morgue, intercepted them on their way to be buried, or dug them up from the almshouse cemeteries and the city's Potter's Fields (Henry 1897; Lawrence 1905; Sappol 2003; Watson 1830). What followed was an illicit, century-long "traffic in dead bodies" (Lawrence 1905:253, 269, 270; Sappol 2003:99) that was well under way by the mid-eighteenth century when Philadelphia's early physicians first began to offer private anatomy lessons. For example, in 1822 the city's Guardians of the Poor investigated complaints about the disrespectful treatment of the almshouse's dead residents and how inadequate methods were used to bury them. When the committee members visited the Potter's Field they found that large pits were dug to accommodate multiple coffins but that:

> … it takes a considerable time to get a sufficient number to fill a pit, *in consequence of the many visitors to carry off the corpses left there for interment*. It is from three to five weeks before they can cover these pits … an examination was made of the three coffins that were in the pit, and it was found that *one of them was empty*. Your committee are of opinion that the persons who attend at the graveyard have the whole charge of the same, *and make such arrangements with the doctors as they please*, and are not accountable to any body" (Lawrence 1905:67–68, italics in original).

The steward in charge was censured but the practice of supplying the corpses to the physicians and their students continued. Clear evidence of these transgressions was unexpectedly discovered in 2004 when construction activities unearthed the autopsied remains of three children buried without their heads at the site of the almshouse cemetery in South Philadelphia that had been used prior to the opening of the Blockley Almshouse and its cemeteries in 1834 (Crist and Crist 2011; Everett et al. 2005).

Many of the patients' dissected body parts remained at the Blockley Almshouse in the form of anatomical specimens placed on exhibit in the Pathological Museum. In fact, the medical students were required to prepare and preserve any specimens removed during surgery or autopsy that the physicians deemed worthy of display. The Guardians established the medical museum in 1860 "for the preservation of pathological and other specimens to aid in the investigation of diseases" (Lawrence 1905:255). Located in the almshouse's Clinic Building, built in 1861, the museum preserved "a large amount of pathological material" (Agnew 1890 [1862]:33). Catalogues of the museum record a wide range of soft tissue specimens and skeletal remains reflecting normal and pathological anatomy, tumors, healed fractures, and developmental disorders (Guitéras 1893; Tyson and Bertolet 1874). Infants, children, and adults all were represented in the museum. The specimens were periodically removed when they deteriorated or were replaced by better examples; these discarded specimens were buried with thousands of other dissected body parts in the almshouse cemeteries.

The specimens that were displayed in the museum had been removed from deceased patients in the almshouse's postmortem room and adjoining dead-house. In remarks that he offered at the opening of the new operating room in 1892, Dr. Roland Curtin (1893:1–2) noted that the small, square rooms:

> … where all the germ-exhaling bodies were carried after death, and where autopsies were held … opened into a hall that communicated directly with the old operating room. The *pathological room*, where the specimens were taken to be mounted for the museum, was entered from the old clinic-room, and the museum, where all the alcoholic and dried specimens were placed on exhibition, surrounded the top of the amphitheatre (italics in original).

As he so poignantly described in his memoirs, Dr. Arthur Ames Bliss performed the autopsy of his patient "Edmunds" in the dead-house in 1883. Three years later a new, two-story dead-house was opened to replace the one that had served the physicians and their students for 25 years. It was here that William Osler conducted most of his 162 autopsies between 1884 and 1888 (Krumbhaar 1933; Rodin 1973; Fig. 12.2); their remains are very likely among those excavated in 2001. In 1890, a new Pathological Museum was built adjacent to the morgue. The supply of specimens continued unabated; Curtin (1893:6) underscores the use of the almshouse patients' remains:

> We have in the winter over twenty-two hundred sick and nervous patients to glean from. To this add the valuable teaching in pathology, to make more effective we have sometimes opportunities to show the classes not only the case, but also the pathological specimens from the bodies of the patients previously lectured upon, verifying or disproving the opinions expressed to the students in the clinics.

There was never any shortage of patients to dissect and from which specimens could be taken for display. Beginning with the first 1000 inmates who entered in 1834, the annual almshouse population had more than doubled by 1854, and reached

Fig. 12.2 Sir William Osler (seated wearing a bowler hat) performing dissections in the dead-house at Blockley in 1887. Note the separated calvarium lying on the table in the foreground

3000 by 1890. At the turn of the century more than 3600 people lived in the various wards and departments of the Blockley Almshouse.

The new century brought significant administrative and physical changes to the almshouse and its property. Recognizing its expanding mission, in 1902 the hospital was renamed the "Philadelphia General Hospital" and was opened to paying patients who were not almshouse residents. In 1907, many of the mentally disabled residents were moved to the new Byberry Mental Hospital located in the far northeastern section of the city; the poor residents were relocated to a new Home for the Indigent nearby in 1914. By 1920 the Philadelphia General Hospital occupied all of the buildings at the Blockley campus. Most of the original almshouse buildings were demolished and replaced in the 1920s to accommodate the tens of thousands of patients who were treated at the hospital over the ensuing 50 years. The hospital was closed in 1977 and its buildings demolished beginning in 1979 and replaced by a new city Medical Examiner's building, a Veterans Affairs nursing facility, and expansion of the Children's Hospital of Philadelphia (O'Donnell 2005).

Archaeology of the Blockley Almshouse Cemetery

The Blockley Almshouse Cemetery excavated in 2001 was the second burial ground located on the almshouse property in West Philadelphia. First used in ca. 1865 after the first cemetery had been closed and its property sold, the most detailed description of the second cemetery is provided by Dr. Charles K. Mills (1890:97):

> The present cemetery is situated west of the southeastern frontage of the buildings, between them and the Schuylkill. It covers about an acre; is surrounded on three sides by a close board fence, and on one, the east, by a pale-fence in the centre of which is a gateway. The fences, and the cemetery in general, have a somewhat dilapidated appearance … This little plot has its full measure of weirdness and quaintness; two old trees, gaunt and gnarled, stand sentinel over the humble mounds and waiting trenches. In all the enclosure, but one grave is marked—a solitary wooden tablet, with a brief inscription.

The cemetery does not appear in any atlases or plans of the city and is depicted only as a simple square labeled “Grave Yard” adjacent to the “Ash Dump” drawn on a plan of the almshouse grounds by Superintendent Charles Lawrence in 1893. Closed in ca. 1895, aerial photographs of the cemetery property show that it remained an undeveloped field covered with scrub brush and tons of discarded ashes until at least 1930. By 1935 the city had opened new, paved streets over part of the cemetery. In the late 1940s a surface parking lot was laid out over the remainder of the area, protecting the interments for the next six decades.

Personal recollections written by several almshouse physicians and contemporaneous newspaper articles note that almshouse inmates initially were buried in the cemetery in large pits and, after the 1870s, in individual grave shafts. This information was confirmed when, in February 2001, the almshouse cemetery was unearthed during construction of a new parking garage located at the intersection of University Avenue and Civic Center Boulevard (formerly Cleveland and Vintage Avenues, respectively). Over the next 3 months archaeologists from the Philadelphia cultural resources management firm Kise Straw & Kolodner excavated 167 grave shafts containing 442 individual interments located within the half-acre portion of the cemetery that had not been disturbed by construction machinery (Fig. 12.3). Based on Dr. Mills’ description from 1890, this preserved area represented about half of the former cemetery. Almost all of the graves had been dug into intact soil and then covered by layers of ashes. A sewer line that had been extended from the Male Insane Department Building in 1888 had been laid over several of the burials. No grave markers or coffin nameplates were found.

Typical of historical American cemeteries, most of the graves were arranged in rows and columns oriented along the east-west axis of the property with the heads of the coffins located to the west. Almost all of the individual grave shafts contained multiple, stacked coffins buried up to eight deep. As expected of almshouse residents, only two of the coffins were decorated with metal handles and few personal effects were recovered. Many of the coffins had been buried in large pits, one of which was located along the northeast corner of the cemetery and included 30 coffins, 28 of which contained the remains of infants and children. Just over half of the other 412 individuals also were infants and children. In addition to the people buried in coffins, 11 clusters of autopsied and dissected human remains were found, 9 of which were discovered along the periphery of the cemetery with 2 more located among the rows of individual grave shafts (Fig. 12.3). When combined with the 442 people from the single grave shaft interments, an estimated minimum number of 690 individuals are represented in the entire skeletal collection.

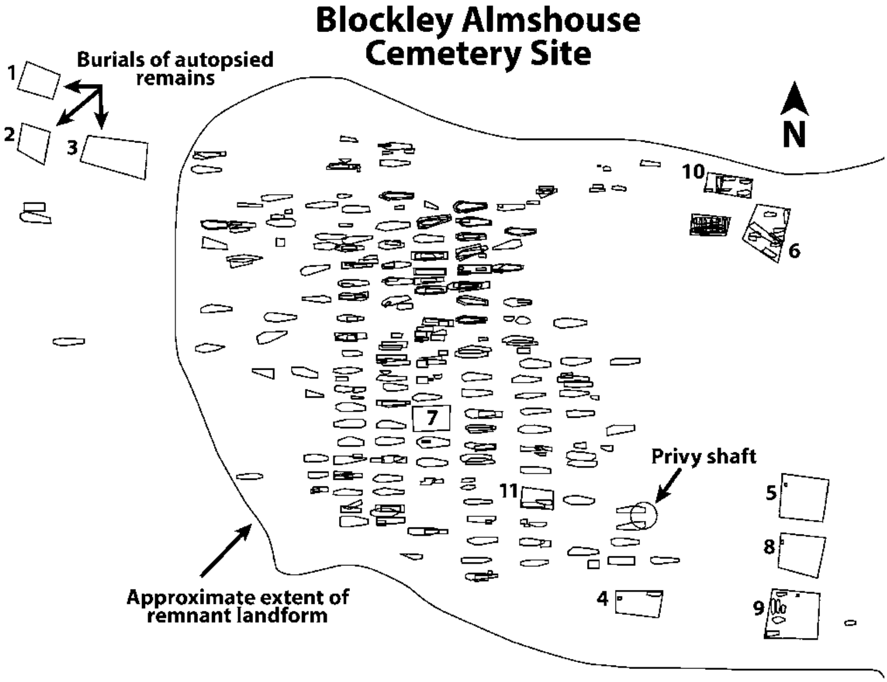

Fig. 12.3 Excavation plan of the Blockley Almshouse Cemetery site (not to scale)

In four of these clusters the remains had been interred in simple rectangular boxes that generally measured 1 ft wide by 4 ft long and 1 ft deep (Table 12.1 and Fig. 12.4). Few of these 138 boxes had lids, even though they were stacked up to four layers deep. All of the boxes were filled with commingled human skeletal remains, occasional sawn animal bones, and artifacts including pharmaceutical bottles, plates, glass syringes, and other debris representing garbage from the Blockley dead-house and laboratories. Based on the number of articulated limbs and vertebrae that were found, many of the body parts had been relatively fresh when they were discarded. In addition, several specimens were fastened together with copper wires and were likely dry skeletal preparations that had been displayed in the Pathological Museum or the clinic room. Commingled human remains and laboratory trash also had been dumped into large pits without boxes in the other five clusters, one of which contained only cremated remains (Table 12.1). In one of the burial pits, the coffins of eight infants had been buried on one side while the other half was filled with dissected human remains. The cemetery was not, however, the only place where dissected remains from the almshouse were buried. In December 2003 a small burial pit containing commingled skeletal remains and medical waste was discovered during soil testing under a lawn located approximately one-quarter mile north of the cemetery. This area had been part of the larger almshouse property but there is no evidence that a cemetery had ever been located there.

Table 12.1 Contents of burial clusters containing autopsied and dissected human remains

Cluster number	Number of wooden boxes[a]	MNI[b]	Contents
General collection	0	12	Autopsied and dissected human remains and medical waste
1	59	11	Autopsied and dissected human remains and medical waste
2	34	12	Autopsied and dissected human remains and medical waste
3	42	38	Autopsied and dissected human remains and medical waste
4	0	6	Autopsied and dissected human remains and medical waste
5	3	67	Autopsied and dissected human remains and medical waste
6	0	11	Loose bones disturbed by 1888 sewer pipe
7	0	–	Cremated remains only present
8	0	29	Autopsied and dissected human remains and medical waste
9	0	32	Autopsied and dissected human remains, medical waste, and eight infants buried in separate coffins
10	0	–	Previously disturbed; no remains present
11	0	8	Autopsied and dissected human remains and medical waste
Burial pit located north of cemetery	0	22	Autopsied and dissected human remains and medical waste
Total		248	

[a]Clusters with no boxes were unlined burial pits in which skeletal remains and medical waste had been buried directly in the soil

[b]MNI determined by numbers of intact and fragmentary crania and mandibles (Baldwin et al. 2014)

Altogether, 150 cardboard cartons of commingled remains comprising 312 cubic feet in volume were recovered from the cemetery site and the northern burial pit. After completion of the archaeological excavations, all of the individuals from the single grave shafts were reburied in the historic Woodlands Cemetery located adjacent to the former Blockley Almshouse property. By order of the Orphans' Court of Philadelphia, the human remains from the clusters of anatomical specimens and surgical waste were retained for ongoing analyses.

Skeletal Evidence of Medical Education at the Blockley Almshouse

The thousands of commingled human bones excavated from the burial clusters in the Blockley Almshouse Cemetery represent the remains of the residents who had been autopsied, dissected, and used for surgical practice over a period of about 30

Fig. 12.4 Excavation of boxes in Cluster 3 containing commingled human remains and laboratory garbage. Note autopsied cranium and bottle at *upper right*

years. The extent of these practices is reflected in Dr. Jefferson H. Clark's comment that over 25,000 postmortems had been recorded between 1867 and 1932 in Blockley's official register (Clark 1933). Analyses of the bones and bone fragments over the past decade have included estimation of the demographic profiles of the individuals represented by crania and mandibles, documentation of patterns of autopsy and dissection incisions, and studies of the pathological conditions that interested the almshouse physicians and their students.

A demographic study of the Blockley Almshouse skeletal collection indicates that most of the individuals whose remains could be analyzed were older men of European descent. Following standard anthropological methods (Buikstra and Ubelaker 1994; Moore-Jansen et al. 1994; Paleopathology Association 1991), in this study all intact and partial adult crania and mandibles from the clusters of commingled anatomical specimens were examined to determine each person's sex, ancestry, and age range at death (Baldwin et al. 2014). Each of the non-mending intact and fragmentary crania and mandibles was presumed to represent a unique individual, although it was possible that some of them had originated from the same person. There were no cranial remains of infants or children in the assemblage.

Of the resulting 248 individuals, 67 % were males, 30 % were females, and 3 % were indeterminate. Among this group 62 % were older than about 35 years when they died. Sixty-five percent of the males and 57 % of the females were older than 35 years at death. Although the ancestry of 71 % of the group was indeterminate, 24 % of the remaining 72 people were estimated to be of European descent, 4 % of African descent, and 2 individuals (1 %) presented morphological features most typical of Asian/Native American ancestry. Men and women were almost equally represented among the individuals who had been autopsied or dissected. Of the 248 individuals, 67 % exhibited evidence of autopsy, dissection, or surgical practice. Four of the specimens had been trephined and 16 others displayed trephination holes together with one or more cuts including bisections, transverse or coronal separations, or inverted V-cuts through the cranial vault bones (Figs. 12.5 and 12.6). No differential patterns of autopsy, dissection, or surgical practice were observed among the demographic subgroups that comprised the study sample. The data suggest that the almshouse physicians and medical students chose to perform their postmortem work on whichever bodies were available and that they often cut into the heads and jaws of the patients to explore and demonstrate specific anatomical structures.

To document which parts of the patients' bodies were most commonly dissected in the almshouse dead room, Hynes et al. (2005) studied the commingled remains from Clusters 4, 6, and 11, which were chosen because they were found in three different sections of the cemetery and possibly reflect temporal differences. After sorting 2534 bones and bone fragments into groups based on bodily regions, Hynes

Fig. 12.5 Right lateral aspect of a cranium from Cluster 8 presenting an inverted-V autopsy cut

Fig. 12.6 Anterior aspect of the same autopsied cranium from Cluster 8 depicting two perimortem or postmortem trephination holes drilled into the forehead

et al. (2005) found that ribs (44.5 %) and vertebrae (13.5 %) together constituted the highest proportion of bone types. Collectively, lower limb bones (femora, tibiae, and fibulae) accounted for 5.9 % of the sample while the bones of the upper extremity (humeri, radii, and ulnae) represented 4.7 %. Twenty-eight crania (1.1 % of the sample), 11 mandibles (0.4 %), and 45 os coxae (1.8 %) were also present among these three burial clusters. Among this sample, 147 bones (5.8 %) presented evidence of postmortem modification resulting from dissection, autopsy, or surgical experimentation. Although ribs and rib fragments comprised the largest proportion of the skeletal sample, none of these bones presented cut marks. Evidence of cut marks was most prevalent among bones of the head: of the 28 crania in the sample, 23 (82.1 %) had been bisected or sawn through transversely. Five of the 11 mandibles (45.5 %) also had been cut, typically bisected at the chin. No pathologic lesions were present among these bones. Among the 341 vertebrae, 19 (13.2 %) had been cut or sawn, the majority of which were from the thoracic region. Most of the appendicular bones had also been dissected or used for surgical practice. When analyzed by bone, 26 % of the 43 humeri, 37 % of the 35 radii, and 40 % of the 40 ulnae had been sawn, all transversely. Similarly, 40 % of the 60 femora, 39 % of the 44 tibiae, and 39 % of the 46 fibulae were cut transversely. The transverse cuts almost certainly represent practice amputations or removal of hands and feet for use as anatomical specimens. The thoracic cage, shoulders, and pelvic girdles do not appear to have been commonly dissected or used for surgical experimentation; only 1 of 14 sterna (7.1 %) had been bisected.

Two studies have documented the extent and nature of the pathological specimens in the Blockley Almshouse Skeletal Collection. Curri et al. (2008) looked at

Fig. 12.7 Anterior aspect of an adult's right proximal tibia and fibula resulting from a healed trans-tibial amputation

the commingled remains found in 42 wooden boxes buried in Cluster 3. Spinal disorders were the most common pathological lesions identified among the thousands of adult remains from this cluster. These disorders were indicated by osteophytes, laminal spurs, fused vertebral bodies, and healed fractures. Five separate examples of vertebrae most likely modified by ankylosing spondylitis (a rheumatic inflammatory disease of genetic origin) were identified in the sample. Examination of the remains from the other 8 burial clusters documented 7 examples of appendicular osteomyelitis, 21 cases of spondyloarthropathy (joint diseases of the spinal column), and 8 cases of healed proximal femoral trauma (Fus Jr. et al. 2006).

Thousands of amputated long bones and fragments were also present in the assemblage from Cluster 3. Virtually all of these long bones presented saw marks with no evidence of healing; they had been either removed from the living Blockley Almshouse patients around their times of death (perimortem amputations) or sawn off after death for surgical practice or to generate anatomical specimens of the various joints. The vast majority of the long bones were cut transversely, with some bisected to reveal their internal structure. Cluster 3 also produced the only sawn specimen in the Blockley Almshouse Skeletal Collection that was healed. This specimen was an adult's proximal right tibia and fibula that had been subjected to a trans-tibial amputation of the leg (Fig. 12.7). In addition to the postcranial evidence of autopsy, dissection, and surgical practice, three crania from Cluster 3 presented trephination holes, none of which were healed. None of the cranial bones presented pathological lesions, suggesting that these holes resulted from surgical practice or experimentation.

Discussion

Philadelphia’s Blockley Almshouse played a pioneering role in the development of the interconnected institutions of American social welfare and medical education. Excavation of the remains of the former almshouse residents provides tangible evidence of how the sick and the poor of the “Athens of America” were perceived, treated, and often mistreated in life and in death. This expression of social power and the consequent marginalization of the city’s “lower sort” (Smith 1990) underscores the point made by Newman (2003:8) that, for them, “class and social status were indelibly inscribed on their bodies … as they struggled to maintain some control over their own bodies and lives.” Newman further notes that the Philadelphia almshouses’ own records reflect concerted attempts by civic authorities, typically the elite of the city, to transform the worthy poor “into hard-working, productive, and deferential members of society” (2003:9). When those efforts failed, the almshouse “inmates” became “patients” under the charge of the physicians and their students who rendered many of them into anatomical specimens and dispatched the others into the cemetery next to the ash dump.

Although tempting to assume that the authorities and medical practitioners viewed the almshouse residents as no more than potential museum specimens or bodies for the dissection table, meeting minutes from the almshouse’s Board of Guardians and the burial practices revealed through the cemetery excavation indicate that this is an unfair characterization. Based on repeated reference in the minutes over a 40-year period, the ongoing problem of body snatching from the Blockley Almshouse cemeteries attracted the attention of the Board members and of the local newspapers. For example, in 1845 six members objected to the removal of bodies from the cemetery for dissection, writing that even among the most depraved:

> … who would not revolt at the idea, if they were consulted on the subject, of permitting their bodies to be exposed in the lecture rooms, cut to pieces for the benefit of the schools and then thrown into a pit containing the remains of hundreds of others? All look to the Guardians for protection; no distinction is practical or expedient (Lawrence 1905:160–161).

The majority of the Board, however, argued that the medical schools must have their subjects and that it was better for the bodies to come from the almshouse than be stolen from the city’s cemeteries and church graveyards. They took no other steps to protect the remains of the deceased residents until scandal forced them to act. In the late 1850s the man who ran the ferry across the Schuylkill River to the almshouse wharf was placed in charge of the cemetery. Lawrence (1905:252) quotes a newspaper article from 1860 accusing the ferryman of selling corpses to the city’s medical students and physicians:

> Medical students during the winter season are charged from ten to fifteen dollars for each human subject for the dissecting tables, and a brisk business is done during the terms of the college lectures in the corpses of those who die at the Almshouse and whose bodies are not claimed by friends.

In response, in 1861 the Board authorized construction of a substantial receiving vault located near the cemetery to store the remains of the deceased residents until they were "removed by their friends or their graves rendered secure from violation by reason of the partial decomposition of their bodies" (Lawrence 1905:264). In proposing the resolution, board member Mahlon H. Dickinson recognized the responsibility of the almshouse overseers to provide respectful burials for all of the deceased residents:

> It is manifestly the duty of this Board to secure to the unfortunate persons who die in the Almshouse the rites of Christian burial, and to extend to their remains after interment the same care and protection as is given to those who have friends and relatives to watch over and guard their last resting places (Lawrence 1905:264).

This sentiment is reflected in the use of individual coffins to bury each deceased almshouse resident. The accounting reports for the Blockley Almshouse include expenditures for hundreds of coffins every year, priced by size for infants, children, and adults. Contemporaneous newspaper articles indicate that the inmates initially were buried in separate coffins interred together in large pits. Beginning in the early 1870s, individual grave shafts replaced the pits, although excavation of the cemetery in 2001 revealed that multiple coffins often were stacked up to eight deep in the shafts. It is likely that the change to individual grave shafts was made to deter the removal of fresh bodies from the larger, open pits by medical students, but the practice is also consistent with the public adoption of more benevolent attitudes towards the sick and the poor that developed as the twentieth century approached. These trends culminated in a ruling by the United States Supreme Court in 1905 that for the first time affirmed the rights of patients to exercise some control over their medical treatment, eroding the "medical paternalism" so prevalent throughout the previous centuries and laying the foundation for the modern concept of informed consent (Katz 2002). This ruling, however, did not extend to the postmortem treatment of a patient's body.

Despite the almshouse rules requiring signed permission from the Chief Resident to conduct autopsies and dissections, the thousands of cut and sawn remains recovered from the former cemetery indicate that these practices were common within the almshouse walls, practices that collectively represent what Andrews (2012:16) calls the routinizing of postmortems where "the dead-house or mortuary had become a central, somewhat mundane site of clinical work." But at the same time the physicians and their students at Blockley expressed some level of respect and sympathy towards the people whose bodies they used. In four of the burial clusters excavated in 2001, the surgical waste from the dead-house and museum had been buried in separate boxes, albeit stacked together in large pits and mixed with laboratory garbage. Curiously, no damaged or broken dissecting instruments were found in any of the burial clusters. In a location where the human remains could have easily been thrown into the Schuylkill River or cremated and scattered in the adjoining ash dump, it is telling that at least some minimal level of dignity was reserved for these mutilated body parts in that the almshouse officials took the time and expense to bury many of them in the simple rectangular boxes that were not quite coffins but were more respectful than no container at all. Additional analysis is required to determine if these different burial practices are date dependent, associated with larger social changes, or reflect orders by the specific members of the Board of Guardians regarding the disposal of the dead.

Even with the care given to the bodies of the residents by the almshouse physicians and their students, burial in the cemeteries did not guarantee permanent nor peaceful rest. Amid unproven allegations that some almshouse physicians were selling bodies in the 1860s and complaints that corpses were being stolen from the cemeteries by medical students and their accomplices (and thereby generating no revenue), proposals for legalizing and profiting from the use of the almshouse dead were regularly made. Finally, in 1883 City Council passed an act that allowed all of the bodies from the almshouse to be distributed to the medical schools for scientific purposes. Lawrence (1905) notes that this legislation effectively ended the practice of body snatching from the almshouse cemetery. Suggesting an end date for the use of the cemetery, Lawrence (1905:317) also wrote that "Since the passage of the bill the Almshouse authorities have not buried any of the paupers who have died." Artifacts recovered from the burial clusters, however, including a newspaper fragment bearing the date 1887, suggest that the former cemetery was used to dispose of the human remains and other garbage from the dead-house until about 1895.

On a different level, the isolated location of the cemetery situated next to the ash dump outside the southwestern corner of the walled almshouse grounds reflects the exclusion of the poor and the sick, first from center-city Philadelphia and subsequently from the almshouse itself. Mirroring similar trends in nineteenth-century England (Philo 2012), establishing cemeteries on the almshouse grounds ensured that the citizens of Philadelphia would be protected from the disease-riddled bodies of the inmates, at a substantial savings to the taxpayers. Stigma was attached to burial in the almshouse cemetery even among the almshouse residents themselves, whose only means of escape, even if symbolically, was interment in a churchyard or public burial ground located elsewhere in the city. Members of the Board of Guardians stated as much in their 1845 protest against the body snatching that occurred from the almshouse cemetery. Philo (2012:100) speaks of the "complex ethico-politics attached to these neglected asylum cemeteries … where deceased lunatics were interred as a 'separate class.'" Having already been separated from the rest of society behind the almshouse walls in the fields of West Philadelphia, the buried residents disappeared from their own enclosed community when they died: as noted by Mills (1890:97) only one wooden tablet stood in the cemetery to mark the graves of hundreds, possibly thousands, of people.

Beyond the sociocultural aspects of the Blockley Almshouse Cemetery, the human remains discovered there also provide insights into medical education in nineteenth-century America. The medical history of the Blockley Almshouse spans the course of 70 years during which time it witnessed thousands of students receiving instruction (Agnew 1890 [1862]; Krumbhaar 1933). As discussed by Hynes et al. (2005), during that time Blockley became recognized as providing "an extensive field for communicating medical instruction to students attracted from all parts of the country by the celebrity of the school" (Agnew 1890 [1862]:22–23). This was further supported by the steady increase in student attendance over the course of the century. Local medical colleges often petitioned to maintain accessibility to clinical education at Blockley. So successful were their petitions that Agnew (1890 [1862]: 17) states:

> … if a patent medicine was to be tested, or any charlatan maneuver to be practiced, the Philadelphia Hospital was a field in which the trial was to be made, like a barber's head everlastingly pulled for stray hairs to determine the cutting qualities of his instrument.

The dissected bones represent the growing importance of gross anatomy as a foundational science in modern medical education. The autopsied remains reveal the evolving interest in, and importance of, establishing causes of death and linking them with specific diseases within the context of a new, scientific field of medicine. The pathological specimens indicate which diseases and disorders interested the physicians and their students as well as the choices they made regarding the specimens to display in the Pathological Museum. At this point in history, medical collections served educational roles that often extended into the realm of popular shows and exhibitions of abnormality (Alberti and Hallam 2013; Worden 2002). The museum at the Blockley Almshouse was well suited to serve all professional and public audiences. Finally, the necessity of medical students to learn and practice the techniques of surgery and amputation is reflected by the hundreds of trephined crania and cut long bones, of which the lower limbs were especially prevalent. Consequently, the Blockley Almshouse Cemetery literally embodies the stories of nineteenth-century American social welfare, medical education, public health, religion, and politics. Beyond the boundaries of Philadelphia, however, the Blockley Almshouse also symbolized the conditions and development of American society on the national scale. The issues surrounding the treatment of the poor and the sick that were faced within its sturdy brick walls, some of which still stand near the now-empty cemetery site, continue to resonate throughout the country today.

One year after they were excavated, the remains from the individual grave shafts were reburied in Philadelphia's historic Woodlands Cemetery. Ironically, there they joined the buried bodies of at least 15 physicians who had trained at or served as resident physicians at the Blockley Almshouse hospital. It is indeed very possible that parts of "Edmunds," the patient whom the young Dr. Bliss had dissected in 1883, lie there too, another anonymous contributor to the success of modern American medicine.

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Chapter 13
Structural Inequality and Postmortem Examination at the Erie County Poorhouse

Kenneth C. Nystrom, Joyce Sirianni, Rosanne Higgins, Douglas Perrelli, and Jennifer L. Liber Raines

Introduction

During the nineteenth century, two processes merged that resulted in the structural inequality of the poor and institutionalized: the reformation of social welfare and the passing of anatomy acts. In the increasingly industrialized United States, high unemployment rates and poverty strained the existing social relief system, fostering the widespread establishment of poorhouses. While ostensibly created to help alleviate suffering, in many instances the conditions experienced by inmates only served to reinforce social and health inequalities. Simultaneously, the nascent medical profession was struggling to professionalize and legitimate itself (see Chap. 6). The *sine qua non* of medical education at this time was the study of anatomy and in an effort to secure a steady supply of anatomical specimens to meet growing demand, and to alleviate the public anxiety associated with grave robbing, anatomy laws were passed that granted medical schools the right to dissect unclaimed bodies. It is argued here that these processes reflect the institutionalization of inequality and manifestations of structural violence.

In 2012, the skeletal remains of 376 individuals were recovered from the Erie County Poorhouse (henceforth ECP) cemetery, 20 of whom exhibited evidence of either dissection or autopsy. While it was a poorhouse cemetery, the unclaimed

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remains of people that died at the Erie County Hospital (henceforth EC Hospital) were also buried there. Therefore, this chapter doesn't focus on the role the poorhouse itself may have played in supplying cadavers for anatomical dissection but rather on the inequality inherent in the formulation and realization of anatomy legislation that made it legal to dissect unclaimed bodies which were predominantly from the poor.

Bioarchaeology of Structural Violence

Structural violence, first articulated by Johan Galtung (1969), is harm done to individuals based on the unequal distribution of resources, wealth, and access to medical services, and above all when the power and control of these resources is unevenly distributed. It is structural because it is embedded in the political and economic forces that constitute social structure and organization; it is violent because it results in direct injury or death (Farmer et al. 2006). As it is so intimately connected to basic social structure and is reinforced and replicated by everyday existence, this type of violence is both invisible and normalized.

To date the investigation of structural violence has focused on lived experiences and the health disparities that manifest due to social inequalities. Researchers such as Fassin (2003), Farmer (2004), and Holmes (2013) have examined the disparities in material resources, education, and job opportunities as they are structured by temporally and geographically distal macro-scale political economic forces. Fassin (2003) focuses on three interrelated structural features of the AIDS epidemic in South Africa including socioeconomic disparities that increase risk of infection, rampant institutionalized sexual violence, and migration. Farmer and colleagues (Farmer 2004; Farmer et al. 2006) discuss AIDS/HIV and tuberculosis epidemics in Haiti and how they are "rooted in the enduring effects of European expansion in the New World and in the slavery and racism with which it was associated" (Farmer 2004: 305). Holmes (2013) describes the experiences of migrant workers in the United States and details the inequalities that are deeply immersed in the labor organization of the farms, as well as the more distal geopolitical forces that affect workers (e.g., NAFTA).

Bioarchaeological investigations of the impact of structural violence have also focused on the lived experience. While evidence of direct violence and trauma may be linked to structural violence, institutionalized social inequalities can also result in other physiological consequences observable in skeletal and dental remains including osteoarthritis and degenerative joint disease, nutritional inadequacies, and infectious diseases (Crandall 2014; de la Cova 2012; Klaus 2012; Harrod et al. 2012; Schug et al. 2013). This chapter argues that the dead can also be subject to harm and that dissection represents a manifestation of structural violence.

Increasingly, bioarchaeologists are considering the life course as extending from conception to postmortem treatment and memorialization (Buikstra and Scott 2009) and that death is not the end of personhood or agency (Crandall and Martin 2014; Hallam et al. 1999). If we accept that death does not result in the dissolution of social persona but may actually intensify personhood (Scheper-Hughes 2011), and that the actions of the living can "harm" the dead, then it is possible to consider "death experiences" as they inform on structural violence. Furthermore, if we are to consider how social experiences become embodied, then we must also consider how "disembodiment" relates to social experiences (Chapman 2000; Duncan and Schwarz 2014; Fowler 2010; Geller 2012; Gillespie 2001; Jones 2005; Rebay-Salisbury et al. 2010).

From this foundation this chapter considers the social significance of evidence of dissection and autopsy within the context of the nineteenth-century United States. The following section discusses two interrelated, macro-scale processes operating at this time that contributed to the structural inequality of the poor: social welfare reform and the passing of anatomy acts.

Structural Inequality of the Socially Marginalized

During the Industrial Revolution there was a fundamental shift in how people worked and earned money, from a predominantly agrarian, credit-based economy to one that was dependent on industrial wage labor (Prude 1999). The industrialization of manufacturing and agriculture resulted in the formation of a class of highly mobile, unskilled, and poorly paid wage laborers that competed for "irregular, seasonal, dangerous, unhealthy, often badly paid work" (Katz 1986: 9–10). These factors increased the likelihood that people would need to seek relief, and during the first decades of the nineteenth century, the increasing number of poor was perceived as a "social problem, a potential source of unrest and the proper object of a reform movement" (Rothman 1971: 156). In 1821 and 1824, Massachusetts and New York created committees to investigate the current state of public relief. They concluded that "outdoor relief" (aid provided outside the doors of an institution) was expensive and likely contributing to the problem of poverty as it encouraged the lazy and indolent nature of the "unworthy" poor, those who are able to work but didn't (Rothman 1971). The root cause of their pauperism was attributed to individual character flaws and not to the fundamental shifts in political economy accompanying the Industrial Revolution. The problem was how to help the "worthy" poor, those who were incapable of work due to sickness, age, or disability, while discouraging the "unworthy poor" (Rothman 1971). The poorhouse was perceived to be the answer: by transferring social relief into the controlled environment of the poorhouse, the worthy poor could obtain the assistance they deserved while also providing the venue in which the character flaws of the pauper could be reformed. The poorhouse failed soon after its implementation, however, and ultimately exacerbated the vulnerability of those that may have sought assistance. While many poorhouses were not well maintained and exposed inmates due to poor and unhealthy living conditions, they were also explicitly targeted as a source of cadavers for medical education in anatomy legislation.

There are two fundamental threads that weave through the social context and history of the nineteenth-century anatomy laws developed in the United States. First, dissection was associated with punishment and was linked to the Benthamite model of social welfare reform (Hildebrandt 2008; Richardson 1987; Sappol 2002).

Secondly, in the nineteenth century, anatomy became a framework upon which society was structured, contributing “to the making of American class identity” and “the creation of a distinctively bourgeois social order and culture” (Sappol 2002: 2, 10). Through these acts, a politically and economically dominant class articulated and utilized dissection as a deterrent and as a punishment for indigence (Sappol 2002). In this manner, anatomy laws were a manifestation of structural violence as dissection became a mechanism “for the ruling class to exert social control over the weak, the marginalized, and criminals” whether or not these groups recognized or were aware of this control (Halperin 2007: 489).

Dissection as punishment for capital offences was first officially sanctioned in 1540 by Henry VIII, and subsequent statutes in both Great Britain and the American colonies reaffirmed this relationship.[1] While this source provided some bodies for dissection, it was insufficient, particularly as the number of medical schools in the United States began to increase in the nineteenth century (from 4 to 160) this supply began to fall short of the demand. This fostered the development of a market for illegally acquired “resurrected” bodies (Hildebrandt 2010; Sappol 2002) and the cemeteries and bodies that were most commonly targeted were socially marginalized groups that had neither the economic or the political capital to stop it (Halperin 2007).

These activities were not invisible and incited public anxiety and fear of grave robbing. Sappol (2002) identifies 20 “anatomy riots” between 1785 and 1855, riots that often targeted medical schools and students. Of particular relevance to this chapter’s topic was the 1788 Doctor’s Mob in New York City. In 1787, a group of free blacks petitioned the city’s common council to stop the removal of the dead from the Negro Burying Ground. The petition was ignored and it was not until a year later when the body of a white woman was reported stolen from Trinity Church that public sentiment resulted in action. The riot that ensued lasted for three days, during which the City Hospital was ransacked, medical students took refuge in the city jail, and six people were killed in confrontations between the mob and a mobilized militia (Sappol 2002). A year later, New York passed the “Act to Prevent the Odious Practice of Digging up and Removing for the Purpose of Dissection, Dead Bodies Interred in Cemeteries or Burial Places.” Many states passed laws to try and stop grave robbing, imposing stiff penalties for both exhuming and receiving bodies.[2] However, these measures seemed to have little effect as grave robbing was a lucrative business given that the fundamental conflict remained: an increasing number of medical schools and anatomy courses and a limited supply of cadavers.

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[1] Here are two examples of such legislation (Sappol 2002): A 1752 act of Parliament required either the gibbeting or dissection of executed criminals, a law that remained in effect until 1832. In 1874, Massachusetts passed a law in which men either killed in duels or that were executed for killing during a duel would be dissected.

[2] A short list of measures meant to stop grave robbing (Sappol 2002): New Hampshire (1796) punishment for the unauthorized exhumation of bodies included a fine of no more than \$1000, no more than 1-year jail time, and a public whipping; Vermont passed similar legislation in 1804; Massachusetts (1815) \$1000 fine and a year in jail; Ohio (1831) \$1000 fine or 30 days in jail with just bread and water.

In the 1820s, the utilitarian philosophy of Jeremy Bentham played a significant role in the development of poor and anatomy laws in both the United States and Britain (Richardson 1987; Sappol 2002). Bentham and his followers argued that poorhouses should be punitive in nature, intentionally designed to dissuade people from seeking public assistance (Sappol 2002); those individuals that did not or could not contribute to society should be made to work. This utilitarian ethos infused the Benthamite perception of the corpse as well. Any sentiment associated with the corpse was an "obstacle to the rationalization of society and culture" and a dead body should only be valued based on its usefulness to the living (Sappol 2002: 118). Grounded in this perspective, Dr. Thomas Southwood Smith, one of Bentham's followers, wrote "The Use of the Dead to the Living" (1824) which would be employed by anatomy law proponents later in the century. Smith argued that individuals receiving public assistance during life owed a debt to society and therefore their bodies could legitimately be used for the public good (Sappol 2002). As mentioned in the Introduction to this volume, the 1832 Anatomy Act and chair of the Select Committee on Anatomy, Henry Warburton was a strong supporter of Bentham. Excerpts from the Committee's report clearly demonstrate the impact of Benthamism: "It is the opinion of almost all of the witnesses … that the bodies of those who during life have been maintained at the public charge, and who die in workhouses, hospitals, and other charitable institutions, should, if not claimed by next of kin within a certain time after death, be given up, under proper regulations, to the Anatomist …" (Richardson 1987: 121). Given that many of the founders of the American medical profession had their initial anatomical training in Europe and Britain, it is not surprising that the same philosophy would come to influence legislation in the United States.

While very controversial, legislatures began to debate, and sporadically to pass, anatomy laws. In 1831, Massachusetts was the first state to enact an anatomy law (limited to Boston) and in 1832 Britain passed the Anatomy Act (Sappol 2002; Richardson 1987). Advocates of these bills focused on two main features of the Act: it would stop resurrection and thus prevent further riots and it would advance medical science as it would provide a steady supply of bodies. In both countries, explicit attempts were made to hide the inherent classism of the bills and eliminate mention of *where* the bodies would be obtained, though the bias was acknowledged and well known by legislators. Richardson (1987: 201) provides this quote from the originator of the British anatomy law, Lord Minto: "that it would be an improvement, if the provisions of the Bill could be so framed as not to point out so distinctly as it did, that its operation had reference to a particular class."

In New York, attempts were made to pass an anatomy law in 1831, 1832, 1843, and 1844, though it was not until 1854 that the "Act to Promote Medical Science and Protect Burial Grounds" (commonly referred to as the "Bone Bill") was passed (Sappol 2002). As in the above examples, proponents of the New York bill stressed that it would stop grave robbing while ensuring that medical science would advance. They justified the inherent classism of the bill based on the utilitarian ethos: "The supply of bodies which this bill may furnish will be mainly from those … brought to wretchedness by improvidence or crime. Having either afflicted the community by their misdeeds, and burdened the State by their punishment; or having been supported by public alms—by offering up their bodies, to the advancement of a human science, they will make some returns to those whom they have burdened by their wants, or injured by their crimes" (Sappol 2002: 129–130, citing 1854 floor speech by New York Assemblyman Rollin Germain). Indeed, supporters of the bill argued that the poor would ultimately benefit as anatomical knowledge "will produce its results in the railroad shanty; it will be felt among the wandering population which fringes the advance of civilization" (Sappol 2002: 128–129).

Despite vigorous opposition, the Bone Bill passed by one vote and was signed into law by the governor on April 3, 1854. While the utilitarian justification of the bill was explicitly articulated by lawmakers, the final version of the bill removed explicit reference to poorhouses which technically meant that any unclaimed body, be it of a wealthy or a poor person, could be used in dissection (Sappol 2002). And while the political economic vagaries of the Industrial Revolution made it such that economic ruin was a distinct possibility for all social classes, in reality the majority of unclaimed bodies came from economically depressed, immigrant, and racialized groups (Halperin 2007). It was these groups of people that were most likely to need the assistance that was offered by the poorhouse while alive and subsequently exposed them to postmortem violence and harm.

Historical and Archaeological Context

The history of the Erie County Poorhouse complex is a rich topic and only a basic outline of its development can be provided in this chapter. The ECP originally opened in 1829 in what is now the Black Rock area of Buffalo, but then moved to its Buffalo Plains location in 1851, finally closing in 1926 (Fig. 13.1). During the 75 years it was open at Buffalo Plains, a reported 181,894 individuals received relief at the ECP. Throughout its history, the poorhouse served the poor of the county and New York State in several capacities including a poorhouse, an insane asylum, a children's ward and school, and a hospital with maternity and consumptive wards. The Erie County Hospital, which started in one wing of the poorhouse, served poorhouse inmates as well as the poor and working class of Buffalo and the surrounding area (Higgins 1998; Raines 2014).

The skeletal remains that are the focus of this chapter were recovered during excavation of the cemetery associated with the poorhouse. Interments in the Buffalo Plains location must have commenced immediately as poorhouse records indicate that the remains of 120 individuals were moved from the Black Rock location in 1852. While the property was transferred to the University of Buffalo in 1909, paupers continued to occupy the Buffalo Plains facility until 1926. Despite this, notations in the Erie County Poorhouse Hospital Mortality Registers suggest that burial in the cemetery ceased in 1913 (Higgins et al. 2014). Therefore, the cemetery was

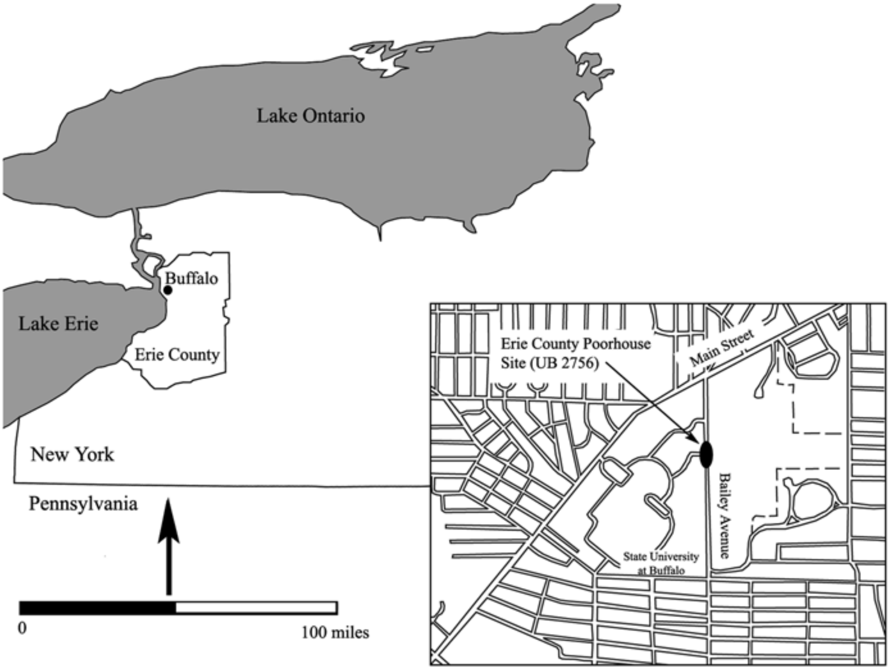

Fig. 13.1 Map of New York State with the location of Buffalo indicated. The inset map demonstrates the location of Erie County Poorhouse cemetery

in use for approximately 61 years and contains the remains of not only the unclaimed bodies of poorhouse inmates but also the unclaimed bodies of individuals that died at the hospital.[3] As a measure of how extensively the hospital was used, records indicate that over a 30-year period (1880–1910) over 46,000 people received care at the Erie County Hospital. Two other statistics derived from hospital records also bear directly on the current topic. Mortality records kept by the hospital indicate where remains were buried. Between 1880 and 1913, of the 7186 individuals that died at the hospital, just over 44 % ($n = 3198$) were unclaimed and buried in the poorhouse cemetery (Higgins et al. 2014). Additionally, the mortality records indicate that between 1897 and 1913, the bodies of 469 individuals were transferred to either the University of Buffalo or Niagara University medical schools to be used as anatomical specimens.[4] Of these, there is only a single record of a body being returned to the ECP cemetery for burial.

[3] While it may be possible that individuals who were not inmates or patients of the Poorhouse complex found their way into the cemetery, it is important to note that both the City of Buffalo and the County of Erie utilized distinct cemeteries for the burial of their other unclaimed dead.

[4] The Medical Department of Niagara University was absorbed by the Medical Department of the University at Buffalo on June 21, 1898.

Archaeological Background

While there are a number of recorded instances of disturbances associated with road construction and/or campus improvement projects, including in 1899, 1938, 1952, 1961, 1964, 1983, 1994, and 2008 (Courier Express (CE), 18 February 1938:7; Courier Express (CE), 5 April 1952:21; Buffalo Evening News (BEN) 1964; Courier Express (CE) 1964; Buffalo News (BN) 1983; Boetsch 1994), the first modern (post-1964) incidence of the discovery of in situ human remains occurred in 2009 during a series of improvements to the university's child day care facilities. At that time, 16 locations were identified that contained partial skeletons in coffins. In 2011, installation of a sewer line in this area prompted active archaeological construction monitoring for human remains, resulting in the documentation of coffin wood at eight locations, and a single human bone fragment. The relative absence of human remains in this area is likely due to sanitation work conducted in 1980. These events, however, set an important precedent for actively searching for remains in conjunction with construction projects.

In 2012, the first controlled, large-scale excavation of human remains from the site occurred prior to major infrastructure improvements to the Michael Road entrance to the University at Buffalo's South Campus (Fig. 13.2). Because human remains were known to exist in this location, the entire proposed work area was excavated to a shallow depth using heavy machinery to remove overburden soils and existing pavement. Following this, a team of archaeologists and physical anthropologists fully exposed individual coffins resulting in the identification of 437 locations with human remains and/or coffin remains. Of these, 364 locations yielded at least one human skeletal element; the remaining locations consisted mainly of partial coffins that had been previously disturbed. Additionally, human remains in the form of small bone fragments were recovered from several locations without coffin remains.

The excavated portion represents approximately 20 % of the total estimated size of the cemetery based on 1929 aerial photos (Fig. 13.2). Material evidence (e.g., coffin orientation and spacing, associated artifacts, condition and construction materials) indicates that there appears to be a line of demarcation between older and newer portions of ECP cemetery. On the east side of this line graves have an east-west orientation and may have been oriented perpendicular to Bailey Avenue or parallel with the southern boundary of the cemetery parcel. This section is considered to be older based on the greater degree of deterioration observed in the human remains and coffins, the presence of more soil in the coffins, and the use of older machine-cut nails and screws in coffin construction.

In contrast, the graves to the west of this demarcation line have a more northeast-southwest orientation and are parallel to, and potentially oriented with, the northern field edge as it existed in 1927. The graves in this area are more tightly grouped with more regular spacing relative to graves in the older part of the cemetery. This section is considered to be more recent based on the preservation of human skeletal material, cloth, leather and coffins, the predominant use of wire drawn nails used in coffin construction, and the recovery of newspapers with 1901 and 1903 dates.

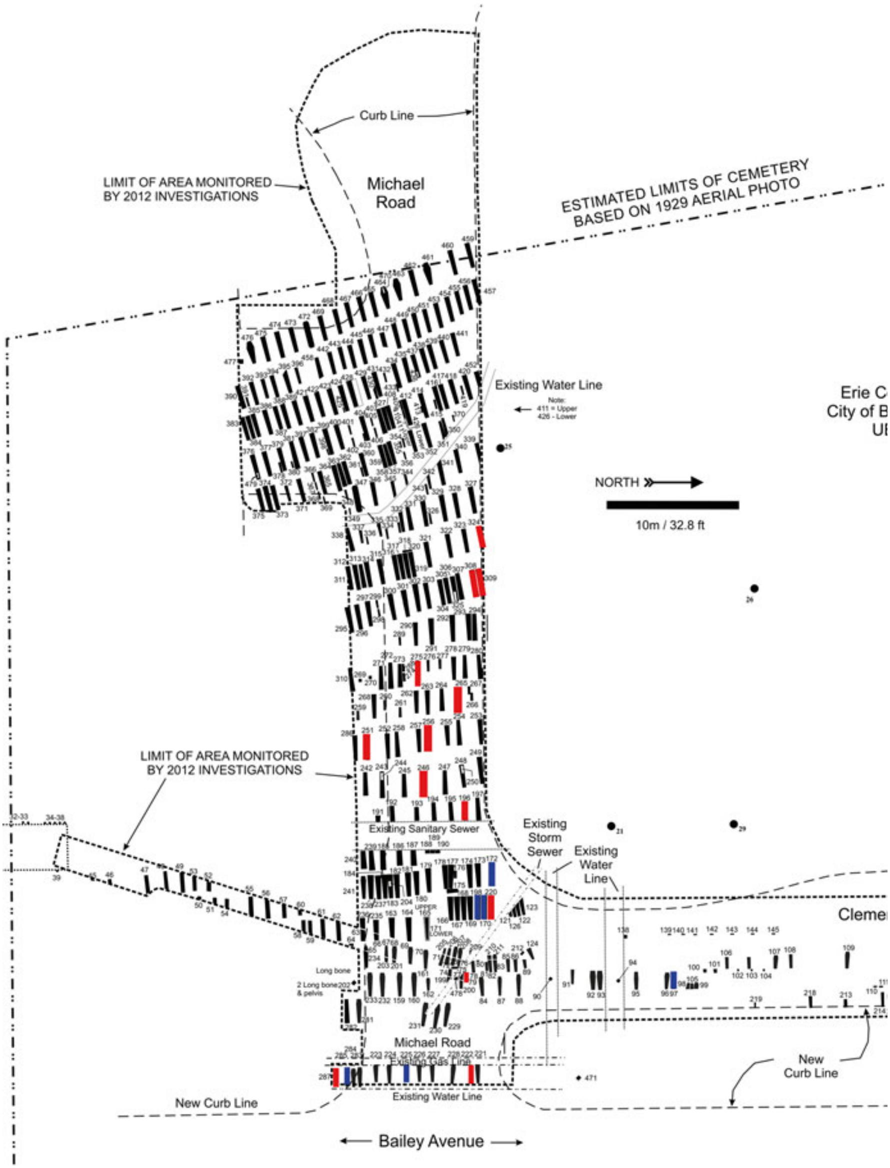

Fig. 13.2 Map of Erie County Poorhouse cemetery with dissected (indicated in *red*) and log burials (indicated in *blue*) highlighted. Base map was created by James Hartner, Archaeological Survey, University at Buffalo

As will be discussed in more depth below, evidence of postmortem examination was observed in 20 burials. As can be seen in Fig. 13.2, eight (40 %) of these individuals are in the western section and 12 (60 %) are in the eastern section. Though these numbers are too small to make any unequivocal statements, the spatial (and possibly temporal) spread of these examples would seem to suggest that autopsies/dissections were occurring throughout the history of the cemetery. In addition to this direct evidence of postmortem examination, six coffins that contained logs were recovered; all are located in the older eastern section of the cemetery (Fig. 13.2). While it not possible to unequivocally conclude that these log burials represents instances in which bodies were kept for dissection or anatomical study, the inclusions of logs would seem to suggest an intentional effort was made to hide whatever was occurring.

Description of Postmortem Examination

The age and sex distribution of the skeletal remains recovered is presented in Table 13.1. There were a total of 58 neonates or infants under two years of age, eight juveniles less than 16 years of age, and 310 adults (Byrnes 2015). Sex estimates were based on standard morphological characteristics of the pelvis and cranium (Buikstra and Ubelaker 1994) and the os pubis (Phenice 1969). Adult age estimates were determined using the methods describing age changes seen in the auricular surface (Buckberry and Chamberlain 2002), pubic symphyseal face (Brooks and Suchey 1990), and phase changes in the sternal ribs (İşcan et al. 1984a, b, 1985).

A total of 20 individuals had evidence of postmortem examination (Table 13.2). Except for one example of a subadult (approximately 7–10 years of age), all of the individuals were adult. There were four individuals (21 %) classified as Young Adult (16–35 years) and 79 % ($n=15$) as Middle or Middle/Old Adult. Of the 19 adults, the majority were male/probable male ($n=9$, 47 %) with only three female/probable female (16 %). The sex of the remaining individuals was either indeterminate ($n=5$, 26 %) or unknown ($n=2$, 11 %).

The most common form of postmortem examination were craniotomies observed in a total of 12 individuals (Fig. 13.3a–d). In ten of these individuals this was the only evidence of postmortem examination. There is variability in the course and direction of the cuts. While not present in all of these examples, the presence of fine-cut marks, particularly on the frontal bone, indicates that the scalp was reflected backwards to expose the bone (Fig. 13.3d).

Two of the individuals with craniotomies also had additional evidence of postmortem examination. One middle adult male (Loc #308) exhibits evidence of a laminectomy, involving a minimum of seven thoracic vertebrae. In five of these vertebrae, it was possible to reassociate the separated lamina and the transverse processes (Fig. 13.4a). In one example, determined to be T3 based on size and morphology, the left lamina was only incompletely transected (Fig. 13.4b). In two instances, it was not possible to unequivocally reassociate the separated transverse processes and laminae.

In addition to a craniotomy, the right femur of Loc #324, another middle adult male, was amputated antemortem, approximately 10 cm distal to the lesser trochanter

Table 13.1 Age and sex distribution of the ECP skeletal collection

	Neonates/Infants (0–2 years)	Juvenile (2–16 years)	Adolescent/Young Adult (16–35 years)	Middle Adult (35–50 years)	Middle/Old Adult (30+ years)	Old Adult (50+ years)	Adult (20+ years)	Unknown age	Total
Male	0	0	19	35	9	6	0	0	69
Probable male	0	0	3	8	24	4	3	0	42
Female	0	0	6	3	3	1	1	0	14
Probable female	0	0	16	5	17	2	7	0	47
Ambiguous	0	0	5	6	30	2	7	0	50
Indeterminate	58	8	9	1	23	1	37	17	154
Total	58	8	58	58	106	16	55	17	376

Table 13.2 Age and sex distribution of those individuals with evidence of dissection or autopsy

	Juvenile (2–16 years)	Adolescent/Young Adult (16–35 years)	Middle Adult (35–50 years)	Middle/ Old Adult (30+ years)	Old Adult (50+ years)	Total
Male	0	1	6	1	0	8
Probable male	0	0	0	1	0	1
Female	0	1	0	0	0	1
Probable female	0	1	0	1	0	2
Ambiguous	0	1	0	4	0	5
Indeterminate	1	0	0	2	0	3
Total	1	4	6	9	0	20

Fig. 13.3 Composite image of craniotomies: (**a**) Loc# 246, (**b**) Loc# 265, (**c**) Loc# 308, and (**d**) close-up of left frontal bone on Loc# 308 exhibiting fine-cut marks possibly due to reflection of the scalp

(Fig. 13.5). There are fine-cut marks near the greater trochanter that possibly represent an attempt to remove the femur.

The second most common procedure observed was sectioned or transected long bones with four individuals (Loc #220, 222, 287, and 304) exhibiting this type of evidence. Individuals #220, 287, and 304 are all middle adult males; Loc #222 is a juvenile of approximately 7–10 years of age. While the age of this individual makes this example distinct, the procedure itself is relatively straightforward. The right tibia was sectioned at two points: immediately distal to the superior surface

Fig. 13.4 Example of a (**a**) complete and incomplete (**b**) laminectomy observed in Loc #308

of the proximal epiphysis and then approximately 4 cm from the distal epiphysis (Fig. 13.6). The sectioning of the left femur of Loc #287 is also straightforward, sectioned completely through at approximately midshaft. The kerf marks on the exposed cortical bone in both individuals run medial/lateral, indicating that the individual was laying supine or prone during the procedure. The evidence in the remaining two individuals indicates more elaborate and extensive examination.

In Loc #220, the evidence suggests that the left elbow was retained. The left humerus is transected below midshaft, just distal to the root of the lateral supracondylar ridge. The left ulna is transected approximately 1 cm proximal to the nutrient foramen and the

Fig. 13.5 The right femur of Loc #324, middle adult male, was amputated antemortem. There are fine-cut marks (*white arrows*) near the greater trochanter

Fig. 13.6 The right tibia of Loc #222 (approximately 7–10 years of age) was sectioned at both the proximal and distal epiphyses

Fig. 13.7 Possible evidence for the retention of prosected left elbow in Loc #220

left radius is sectioned 1.5 cm proximal to the root of the interosseous crest. There seems to be two discrete cutting events on the radius. A more proximal cut is shallower and did not penetrate through the full thickness of the bone. The distal cut has a more sharply angled trajectory (angles proximally from medial to lateral) and intersected with the proximal cut, and continued for nearly the full thickness of the bone. In both the radius and the ulna, there are small, roughened bone spurs on the posterior side of the exposed cortical bone where the last bit of the diaphyses was snapped off rather than cut (Fig. 13.7). While there is no indication of any pathology that might have provided the motivation to keep the elbow, given that the distal portions of the radius and ulna were recovered during excavation, it is suggested that the elbow was preferentially removed, possibly in order to retain it as a teaching specimen.

In Loc #304, a "window" was created in the right femur by removing the anterior portion of the distal diaphysis (Fig. 13.8). Three separate, transversely oriented cuts were made on the distal third of the diaphysis, each cut penetrating only approximately 20 mm into the diaphysis. A longitudinal cut was then initiated at the distal epiphysis and proceeded proximally, intersecting the transverse cuts sequentially. As the saw cut proximally, the blade was reorientated as it met each transverse cut and removed a section of the anterior diaphysis, of which only the most distal section remains. This individual also exhibited evidence for a thoracotomy as the manubrium was cut along the sagittal plane through the middle of the suprasternal notch. The gladiolus is also cut sagittally. The resulting right half of the gladiolus was then cut transversely between the first and second costal notches.

Two other individuals, Loc #171 and #346, both adult males, also have evidence of thoracotomies. In Loc #346, only four transected rib fragments were recovered. The clearest evidence for the opening and removal of the chest plate is observed in Loc #171. In this individual, the body of the sternum was transversely sectioned just inferior to the fifth costal notch. Additionally, there is evidence that eight ribs were cut. Both the right and left second ribs were cut approximately 4 cm from their sternal articulations. The left third through fifth ribs were cut approximately 6 cm, 7.5 cm, and 8 cm, respectively, from their sternal articulations. While the sternal ends of the right ribs were not recovered, this pattern of increasing distance suggests that the chest was cut open in an inverted V-shaped pattern (Fig. 13.9a–c).

There is a single individual, Loc #79, a middle adult male, for which the evidence points toward surgical intervention possibly related to a perimortem fracture

Fig. 13.8 (**a**) Anterior and (**b**) medial view of the right femur of Loc #304

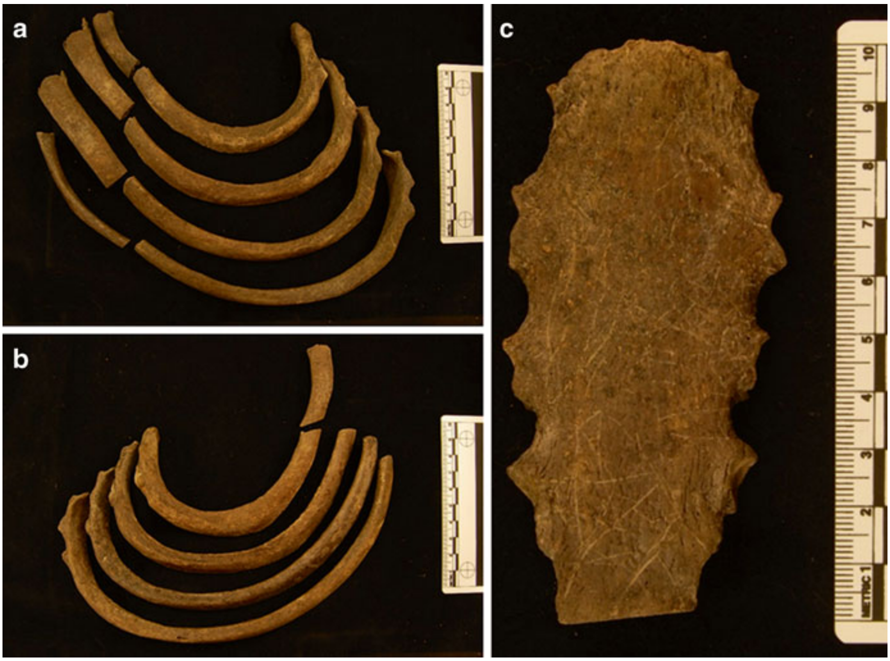

Fig. 13.9 Evidence of a thoracotomy in Loc #346; (**a**) left ribs #2–5, (**b**) right ribs #2–5, (**c**) manubrium

Fig. 13.10 Example of a possible perimortem surgical intervention in Loc #79, a middle adult male

of the left femur. There is an oblique, complete, comminuted perimortem fracture, with at least five fragments (only four of which were recovered) that angles from the anterior midshaft to posterior popliteal surface. There are two sets of cut marks. The first is a transversely orientated cut approximately 18 cm distal from the femoral head. The cut angles from proximal/lateral to distal/medial. Kerf marks on the exposed cortical bone run from anterior to posterior, suggesting that the cut was initiated on the lateral or medial aspect of the thigh (Fig. 13.10).

The fragmentation of the posterior aspect of the distal diaphysis resulted in the creation of a large triangular shaped spur of intact cortical bone near the medial side of the popliteal surface; the proximal 2 cm tip of this spur appears to have been cut off. While there are no observable kerf marks on the exposed cortical bone, it is not similar in appearance to the perimortem fracture, nor does it appear to be due to postmortem taphonomic damage as the exposed cortical bone is very smooth and straight.

Based on the above evidence there are two possible scenarios. First the individual broke his femur and was brought to the ECP Hospital where doctors attempted to amputate the broken leg. The small cut observed on the distal, posterior diaphysis could have occurred simultaneously with the amputation, perhaps as a form of exploratory procedure to assess the extent of the damage, or as a limited post-amputation procedure. Alternatively, the individual could have died before any form of surgical intervention. In this scenario, all of the cuts observed on the individual could be postmortem.

Discussion

It is argued here that there are fundamentally two manners in which structural violence may manifest. Medical anthropologists like Paul Farmer and Seth Holmes have examined how social inequalities become embodied due to structural differences in access to food, education, and health care that are deeply ingrained in our modern political and economic organization. Bioarchaeology is well suited to extend this concept into the past and through the analysis of skeletal indicators can examine the embodiment of lived experience of structural inequalities (e.g., Klaus 2012).

Drawing on sociological concepts of the body, bioarchaeological analyses also have the potential to move beyond considering the impact of social inequality on the living and consider the postmortem fate of the body. A methodological and theoretical focus on the lived social experience to the exclusion of "death experiences" establishes a dichotomy between life and death that neglects the continued presence of a social identity. A bioarchaeology of structural violence must therefore also consider the treatment and fate of the dead body, including "disembodiment" and the fragmentation of the corpse. This chapter sought to frame the discussion of the postmortem examination of unclaimed bodies as a form of structural violence, violence experienced by groups or individuals based on inequalities in access to resources and power that are built into a hierarchical societal structure.

As stated in the introduction of this chapter, the focus of this chapter was on the broader context in which the poorhouse emerged as a punitive institution and anatomical legislation was passed that served as a deterrent to indigence. Indeed, there are still several pieces of this puzzle that are missing that impact our ability to fully understand the role that the Erie County Poorhouse and other institutions such as prisons and morgues may have played in providing cadavers to medical schools. While we know that the EC Hospital was providing cadavers to medical schools between 1897 and 1913, we don't know if they were supplying cadavers between 1854 and 1896, though there are indications that the County Morgue may have been a source of bodies. Further, the level of demand for cadavers is unknown as we do not have enrollment statistics for either University of Buffalo or the Niagara University medical colleges. Additionally, it is not possible to determine exactly where the individuals buried in the ECP cemetery were dissected or autopsied. While the EC Hospital had a system of paid physicians and medical assistants that may have had other university or hospital affiliations, the hospital itself had no known specific formal affiliation with any college medical department. As discussed above, only a single body that was transferred from the EC Hospital to the local medical schools specifically for dissection was returned for burial. While it is possible that the individuals were dissected or autopsied at the EC Hospital, it did not have a medical school. There is no documentary evidence that indicates that dissections or autopsies were occurring, though some of the remarks on the EC Hospital Mortality Records would suggest that an autopsy was performed but it was never actually explicitly stated. Finally, it is possible that the procedures were carried out on the grounds of the poorhouse itself, as there were various "dead-house" and "morgue" buildings during this period, but again, while the documentary evidence is rich, it can also be frustratingly deficient in some regards.

So what do we know? We know that the skeletal remains recovered from the EC cemetery largely represent the remains of unclaimed individuals that died between roughly 1851 and 1913. These bodies came either from the poorhouse itself or from the EC Hospital. We know that the laws of New York State made it legal to dissect unclaimed bodies and that these laws, as argued above, reflect a structural inequality and a form of violence. While we are unable in this instance to unequivocally state that the ECP was a source of cadavers used in dissection, we do know that poorhouses were significant sources of anatomical specimens during this time period (Halperin 2007; Richardson 1987; Sappol 2002). We also know that between 1897 and 1913, the EC Hospital transferred the bodies of 469 individuals to medical schools in the area to be used as anatomical specimens and that they represent the poor and working class of Buffalo and the surrounding region. As unclaimed, the potential existed that these bodies could be dissected or autopsied without any form of consent. At some level, all of the skeletal evidence discussed above could reflect structural violence, as anatomical legislation is a manifestation of economic, political, and social inequalities. Of course, it is not possible to categorize all examples of postmortem examination as manifestations of structural violence, just as not all poorhouses contributed to the health and social inequities experienced by the poor. That being said, based on the skeletal data and our understanding of the historical sociopolitical context, it may be possible to differentiate between examples of autopsy and dissection in the ECP cemetery collection. One very significant caveat: the line between cutting the body for education and cutting the body to determine the cause of death is very fine and likely blended back and forth in practice. Therefore, the following discussion focuses on the most conservative interpretation.

Those individuals in which the evidence most clearly points toward dissection include those instances in which it is possible to observe the greatest degree of fragmentation including when multiple bones were cut (Loc #304), long bones were sectioned (Loc #222, and #287), body parts were retained (Loc # 220), and laminectomies were performed (Loc #308). It is argued that these represent examples of dissection and, given the political-economic and social context in which they occurred, reflect violence and harm.[5] While the level of fragmentation observed in this collection is not as extensive as has been reported in other such samples (Blakely and Harrington 1997; Hodge 2013; Chap. 6), the skeletal evidence observed in these individuals more clearly suggests "exploratory" procedures that fragmented the body. This fragmentation stripped the individual of their social identity and transformed them into objects. In particular this is most evident in the Loc #220, for which there is evidence that the left elbow was removed and retained. As discussed by Hodge and colleagues (Hodge 2013; Chap. 6) bodies were transformed from subject to teaching objects that while involving the loss of social identity simultaneously reinforced a living social identity. While a dead body is no longer an experiencing body, the dead may still interact in a relational social network and therefore continue to have a social identity (Hallam et al. 1999; Tarlow 2008). In her discussion of the postmortem punishment meted out on Cromwell's corpse, Tarlow (2008: 73) suggests that the "social identity between someone and their body did not cease at death: that the body continued to act as an index of the person past the point of death."[6] During the eighteenth and nineteenth centuries, dissection was regarded as a violation of the body and as discussed was punitive in nature. In contrast, an autopsy marked an individual as important enough as to warrant an investigation of their death (Crossland 2009;

[5] The concept that it is possible to harm the dead has been a topic of ethical debate within archaeology for several decades (e.g., Bahn 1994) and is emerging within bioarchaeology more recently (e.g., Zuckerman et al. 2014).

[6] Hodge et al. (Chap. 6) discuss an example in which John C. Warren, founding professor of Anatomy and Surgery at Harvard Medical School, donated his skeletal, noting that "As a successful, white, male, educated, politically connected medical professional, Warren was empowered within the structural systems of his period. He extended his personhood by controlling his body beyond death."

Martensen 1992; Sappol 2002; see Chap. 5 for an example of this distinction). Therefore, how one was treated after death served as index for life experiences.

For the remaining individuals, the skeletal evidence does not as clearly suggest an exploratory or educational intent. The involvement of the skeleton and degree of fragmentation are more limited and are restricted to one area or element: ten individuals had craniotomies while two individuals exhibited evidence of thoracotomies (Loc #171 and Loc #346). This may indicate that the function of the procedure was narrower and more focused which leads to the possibility that these individuals were autopsied rather than dissected. Still, we cannot forget that these individuals represent the unclaimed bodies of the poor and working class of the region and therefore it is unlikely that this reflects the same connection between living social status and autopsy as noted by other researchers (Crossland 2009; Chap. 5). Again, the line between the autopsy and dissection is blurred; the manner in which these specific individuals died may very well have precipitated the investigation of their death (i.e., autopsy) but the intent behind the procedure may have been principally educational and an opportunity to investigate pathological anatomy.

Conclusion

Structural violence may be a useful framework from which to consider the impact of the social reform movement and anatomy laws. Since the sixteenth century dissection was used as a form of postmortem punishment and in the nineteenth century it became a means of deterring indigence. In their bid to distance themselves from the social taint associated with resurrection, the medical profession became enmeshed with the social reform movement and the emergence of the poorhouse as a punitive institution. The inequity of the anatomy laws that were passed during the 1800s was recognized by both opponents and supporters, used by the former to fuel their moral argument and used by the latter as justification. While this fundamental inequity was intentionally hidden behind the word "unclaimed," in reality the law disproportionately impacted the poor, immigrants, and free and enslaved African-Americans and reflects the disparate access to power characteristic of structural violence.

This chapter sought to extend the concept of structural to include harm done to the remains of the deceased. The socioeconomic and political context established a structural inequity that disadvantaged the poor and destitute which during life led to disparate access to resources and increased exposure to conditions that caused harm. This subsequently created the potential for the postmortem continuation of inequality and harm. The contextualized analysis of such evidence can contribute to our understanding of the interplay between sociopolitical and economic organization and changing conceptions of the body and personhood.

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Anthropologists. Additionally, aspects of the discussion of structural violence were presented by the first author at the symposium *The Embodied Politics of Inequality and Pain: Case Studies from Bioarchaeology* at the 2014 Society for American Archaeology meetings. Lastly, the authors thank Debra Martin and the anonymous reviewers for providing very useful advice and comments.

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Chapter 14
Exploring Evidence of Nineteenth Century Dissection in the Dunning Poorhouse Cemetery

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Introduction

Throughout the last two decades, there has been an upsurge of anthropological interest in the history of medical practice in the United States and England and the appropriation of human skeletal remains derived from historically marginalized populations (see, for instance, Mitchell 2013, Schultz 1992). Owsley (1995), as well, has brought to light the nineteenth century use of bodies of African Americans for anatomical experimentation in his analysis of the Charity Hospital skeletal sample (see also Chap. 8). Harrington and Blakely (1995a,b), using a waste stream model, evaluated commingled bones found in the basement of the Georgia Medical School, and concluded that bodies of African Americans were stolen from nearby cemeteries for study, then discarded by medical students. More recently, Kenneth Nystrom (2011) and many authors throughout this volume have explored the social significance of autopsy and dissection through the lens of embodiment theory. As posited by Csordas (1990:5), "This approach to embodiment begins from the methodological postulate that the body is not an *object* to be studied in relation to culture, but is to be considered as the *subjec*t of culture." This approach sheds new light on our understanding of the past, as it helps elucidate decisions, behaviors, and social beliefs of the living and the dead. The goal of our research was to evaluate skeletal evidence from the Dunning Cemetery skeletal sample (ca. 1851–1869), excavated in 1990, through the lens of embodiment theory, and to explore the relationship between social inequity and medical practice in the city of Chicago during the latter half of the nineteenth century.

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Background

The Cook County Poor Farm, consisting of 160 acres, later to become the Cook County, or Dunning Poorhouse and Insane Asylum, was established in 1851—10 miles west of the city of Chicago. An article in the December 14, 1854, *Daily Democratic Press* indicated that the facility included a 3-story brick building, with a 2-story wing designated for the insane. Few, if any, records exist today pertaining to the facility. However, in an unpublished manuscript by Henry Hurd in 1915, chronicling the history of the Chicago State Hospital (which was later built at Dunning), he cites the First Biennial Report of the Board of State Commissioners of Public Charities of the State of Illinois, dated December, 1870. Here he quotes that, “Although the keeper of the Cook County Almshouse seems to be a humane, conscientious man, who conducts the institution on the very best of this ability under the circumstances and surroundings [sic], it is nevertheless for so wealthy a county a miserably planned and badly managed institution” (Hurd 1915:1). His depiction of the “insane department” of the facility is dire: “The cells were about seven by eight feet; they were not heated, except by a stove in the corridor, which did not raise the temperature in some of them above the freezing point; the cold, however, did not freeze out the vermin with which the beds, walls and floors were alive” (Hurd 1915:2).

Poor living conditions in the almshouse and insane asylum were exacerbated by overcrowding. The 1860 census lists the names of 200 poorhouse residents: men, women and children (Grauer et al. 2000). However, by 1870, the census rolls expand to 424 residents (Walker 1872; Grauer et al. 2000). Hurd’s citation of the report of the Board of State Commissioners of Public Charities states that, “the capacity is probably not over 450, while the number of inmates is sometimes as great as 700” (Hurd 1915:1). Accounts of admission of new residents into Dunning corroborate this bloated figure. *The Chicago Daily Journal*, March 11, 1858, reported that 435 individuals entered Dunning during the winter of 1857–1858, and according to *The Chicago Daily Journal*, September 15, 1858, 350 people were admitted during the summer months of that year. Although using “new admissions” cannot be used as a direct proxy for determining “residents” of the facility at any given time, since the population size prior to the arrival of new tenants is always unknown, the high number of new admittants each season suggests that the facility often surpassed capacity. What records of admission and release and census data clearly indicate, nonetheless, is that the preponderance of individuals entering, leaving, and living at the Dunning Poorhouse and Insane Asylum were male European immigrants (Grauer et al. 1998, 2000).

There are no historical records documenting the creation or early use of a cemetery associated with the Farm or Poorhouse. County records from 1869 allude to the fact that 20 acres had been devoted for the burying ground at the County Farm, but that the cemetery grew to become too close to the Insane Asylum. A recommendation was made at that time to move the cemetery approximately 50 yards west (Keene 1989, 1990). When or how the disinterment of bodies was carried out

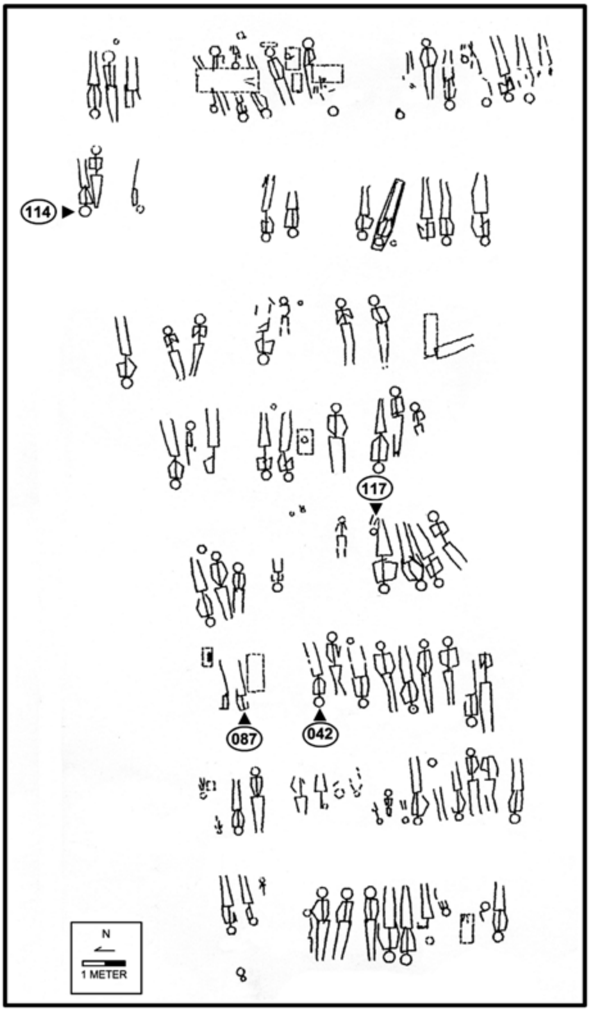

Fig. 14.1 Map of burials excavated from the Dunning Poorhouse Cemetery. Adapted from Keene and Grauer (1993)

remains unknown. However, it is clear from archaeological surveys and excavation that not all of the remains were relocated. In 1990, a minimum of 120 individuals, buried between 1851 and 1870, were recovered from the original cemetery (Keene and Grauer 1993); these are the focus of our attention.

The archaeological excavation of a circumscribed area slated for development revealed the presence of a reasonably well-organized cemetery (Keene and Grauer 1993). Eight rows of interments, with few grave cuts intruding upon previous burials, were aligned on a north/south axis (Fig. 14.1). Most individuals were buried in coffins, recognizable by the recovery of wood and/or coffin hardware. Occasionally, material artifacts such as boots, spectacles, and rings were recovered in association with a burial. Orientation of the heads of bodies within rows was surprisingly variable. The head of some individuals was oriented to the east, while others within the same row and immediately parallel were oriented to the west. Developing a spatial chronology of the cemetery proved impossible, which impaired our ability to assign dates to particular graves or rows of graves.

Before launching into our results, it is important to mention the recent history of the excavation of human remains in Illinois. In 1989, a year prior to uncovering human remains at Dunning, Illinois Governor James Thompson signed the Human Remains Protection Act for the protection and preservation of unregistered graves on public and private land. It was this newly passed law that forced developers, who were building condominiums at the Dunning site, to contact authorities when skeletons began to appear at the base of their trenches. Bioarchaeology as a research paradigm was relatively new; skeletal data recording was not standardized, photographs were taken relatively sparingly, and the goal of contract work was to provide an inventory, demographic assessment, and very brief overview of pathological conditions before the remains were reburied. Fast forward 25 years, we find our records for this excavation and skeletal analysis are limited. Nonetheless, reevaluation of the skeletal and material evidence provides insight into postmortem intervention in late nineteenth-century Chicago.

The Sample

A total of 114 burial features were recorded at the Dunning Cemetery site. From these, 120 individuals were recovered, of which 106 were assigned an age at death. The mortality profile of the skeletal population indicates that 35 % of the cemetery population were under the age of 15, 30 % were between the ages of 15 and 25 years old, and 36 % were over the age of 25 (Grauer and McNamara 1995). Of the 61 adults in the sample, 56 % ($n=34$) were female and 44 % ($n=27$) were male (Grauer et al. 1998). In a demographic assessment of the cemetery (Grauer et al. 2000), which compared the skeletal sample with 1860 and 1870 census records, children and women appear to be overrepresented in the Dunning Cemetery.

Results

Amongst the 114 burial features from the original Dunning Cemetery delineated by the archaeologists, there appears to be five anatomical elements displaying postmortem alteration.

The first instance of alteration can be found in Burial Feature 017C. Here, an assemblage of disarticulated and fragmentary bone was recovered. Included in the assemblage were fragmentary parietals, frontal and occipital bones, a fragment of

T1, and right and left rib fragments. The upper extremity was represented by the diaphyses of a right humerus, right radius, and right and left ulnae. The lower extremities were represented by the diaphyses of the right and left femora, right and left tibiae, and right and left fibulae. Hence, due primarily to postmortem taphonomic destruction, no long bone was recovered with an epiphyseal end. Determination of age at death, other than the individual being an adult, and sex of the individual (or individuals) was impossible. Pathological assessment of the remains noted severe remodeled periosteal reaction along the diaphyses of the right tibia and left fibula.

Along with the assemblage of human bone, the archaeologists recovered coffin nails and fixtures, 19 pieces of coffin metal from the burial fill, one white glass button, and a faunal tooth and claw (Keene and Grauer 1993).

Two human bones from this feature exhibit postmortem alteration. The first instance appears as a transverse cut through the diaphysis of the right femur (see Fig. 14.2). Based on a photograph taken of the specimen, the tight and parallel kerf marks suggest the use of a saw. The cut appears to have been initiated on the medial aspect of the diaphysis of the femur and terminated with splintered bone on the lateral aspect. Postmortem alteration is further suggested by the lack of reactive or remodeled bone associated with this cut.

The second instance of postmortem alteration in this burial feature appears on the left femur, where a transverse cut through the diaphysis was noted. The orientation of the cut was not recorded. Archaeologists note that this burial feature appears disturbed, possibly due to prior construction at the site. However, the possibility that

Fig. 14.2 Postmortem transverse cut through the diaphysis of the right femur of Burial Feature 017C: an adult of unknown sex

disruption occurred well before construction, possibly associated with the original feature, cannot be overruled. The inventory of skeletal material associated with Burial 017C indicates a minimum number of one adult individual. However, given the feature's poor condition and severe disturbance, there is potential for multiple individuals to be represented by these bones.

The next notable burial feature is Burial 087W. This is an adult male whose cranium is absent. The postcranial remains, however, are in fair condition represented by virtually all the vertebrae, many rib fragments, the scapulae, and innominates. The upper extremities are represented by the left humerus, radius, and ulna, and carpals, metacarpals, and phalanges from both sides. The lower extremities are represented by the right femur, the right and left tibiae and fibulae, the right patella, and tarsals, metatarsals, and phalanges. The pathological assessment notes the presence of mild osteoarthritis on some thoracic and lumbar vertebrae, and the presence of Schmorl's nodes on T7-L4. Mild, remodeled periosteal reaction is present on the diaphysis of the right tibia, while the left tibia, and right and left fibulae display moderate to severe remodeled periosteal reaction. The only material artifact recovered from this burial was one white glass button.

Of interest in this burial feature is the left tibia which displays a transverse cut through the proximal third of the diaphysis. The remainder of the diaphysis and epiphyseal end are missing. The orientation of the cut is unrecorded. Although periosteal reaction is noted on this anatomical element, the presence of remodeling, along with multiple elements displaying this lesion, indicates that the transverse cut through the tibia occurred postmortem and was likely not associated with the infection/inflammation that the individual had suffered during life.

Burial Feature 042M yielded an articulated skeleton of a male approximately 45–55 years old. The cranium is represented by the right and left parietals and temporals, the occipital, the mandible, and fragments of the right and left maxillae. Missing are the zygomatics and smaller facial bones. The axial skeleton is represented by fragmentary vertebrae, ribs, scapulae, clavicles, and innominates. The upper extremity is represented by fragmentary humeri, radii, ulnae, and some metacarpals and phalanges. Lower extremities are represented by fragmentary femora, tibiae, fibulae, and a few tarsals and metatarsals.

Pathological assessment of this individual noted that moderate remodeled cribra orbitalia was present, along with moderate osteoarthritic changes to joints of the phalanges, the left acetabulum, the right femur and talus, and articular facets of the cervical vertebrae. The archaeologists note that the recovered material artifacts from this burial feature include 12 coffin nails and some unidentifiable pieces of coffin hardware, and five white buttons. Importantly, archaeologists also recorded the burial as extended, with the hands of the individual crossed over the pelvis. The maxilla was recovered adjacent to the left innominate.

The relevant anatomical element in this feature is the cranium. Here a deliberate transverse cut approximately 37.5 mm below lambda extends around and through the left and right temporals. With no indications of periosteal reaction or other unusual pathological condition, it is likely that this cut represents postmortem dissection.

The final instance of postmortem alteration appears in Burial Feature 114A2. This feature yielded a female approximately 35–45 years old. The cranium was recovered in excellent condition, along with maxillary and mandibular dentition. The post cranial remains are virtually complete, with only the sternum, hyoid, some carpals, metacarpals, and phalanges missing from the upper part of the body, and phalanges missing from the lower extremities. Recorded dental pathology includes the presence of periodontitis with alveolar resorption, enamel hypoplasias, antemortem tooth loss, and severe maxillary prognathism. A healed fracture of the left nasal bone is present, along with a healed fracture of the distal epiphyses of the right radius and ulna, resulting in fusion of these bones with the right triquetral and scaphoid. Mild to moderate osteoarthritis is recorded on many joints throughout the body. Material remains recovered from this burial include coffin nails and three white glass buttons.

The key anatomical element in this burial feature is the mandible. Within this element three deliberately incised circular lesions are present: each approximately 17 mm in diameter. The first lesion appears on the body of the mandible inferior to the right first and second premolars (Fig. 14.3). Puncturing the outer cortex of the mandibular body, the lesion completely transects the cortex along the inferior and posterior margins of the lesion, while failing to completely penetrate the outer cortex on the superior and anterior aspects. The second lesion is located posterior to the first, on the right side of the body of the mandible, inferior to the second and third right molars. While a clearly cut anterior margin of this lesion is recognizable, all other margins are lost due to postmortem damage. The observable margin of this

Fig. 14.3 Two postmortem circular lesions on the right side of the mandible of Burial Feature 114A2: a female approximately 35–45 years old. The lesions were created by a 17 mm trephine

lesion suggests that a same-sized tool was used to create this incision. Lastly, appearing on the left side of the mandible immediately superior to the gonial angle, and impacting the ascending ramus, is another circular lesion (Fig. 14.4). Although the ascending ramus has been lost postmortem, the calculated dimensions of the lesion appears to be similar to the two on the right side of the mandible. In all instances, there are no signs of periosteal reaction or antemortem response to the incisions.

Discussion

The five anatomical elements displaying signs of postmortem alteration stand as unique anatomical elements in an otherwise predictable cemetery assemblage. As such, their presence might provide insight into attitudes towards human bodies, social inequity, and medical practice in nineteenth century Chicago.

Throughout the nineteenth century, anatomy and dissection became primary foci of physicians as they worked to professionalize their field (Sappol 2002:71). Access to bodies, however, was limited. In 1825, the State Legislature of Illinois approved an act to prevent the disinterment of the dead for medical investigation or use. Over a century later, in 1927, Zeuch wrote in disapproval of the ruling: "expressing the opinion that it manifested antagonism to the medical profession because it would hinder physicians and surgeons from obtaining and using human cadavers for dissection" (Davis 1955:368). However, according to Davis, a postscript to the Act provided sanctions under which bodies could be appropriated for dissection:

Fig. 14.4 One postmortem circular lesion on the left side of the mandible of Burial Feature 114A2. The lesion was created by a 17 mm trephine

> "If any person or persons shall open the grave or tomb where the body or bodies of any deceased person or persons shall have been deposited, and shall remove the body or bodies or remains of any deceased person or persons from the grave or place of sepulture, for the purpose of dissection, or any surgical or anatomical experiment or any other purpose, without the knowledge and consent of the near relatives of the deceased, or shall in any way aid, assist, counsel or procure the same to be done, or shall aid or assist in any surgical or anatomical experiment therewith, or dissection thereof, knowing said body or bodies to have been so taken or removed from the place or places of their sepulture, every such person so offending, being thereof duly convicted, by indictment before the circuit court, shall forfeit and pay a fine not exceeding five hundred dollars, and shall be imprisoned in the common jail of the county, not more than twelve nor less than three months, at the discretion of the court, the fine for the use of the county to be paid as other fines are required." (Davis 1955:368).

Whether doctors were successful in convincing families to consent to dissection remains unknown. The overall subtext of the Act, however, is clear: the deceased with stable family ties were readily protected under the law, whereas recent immigrants, the disenfranchised poor, the homeless and mentally disabled, were not. Similarly, bodies of criminals were exempt from this protection, as the 1825 Act specifies that "the provisions of this act shall not be construed to extend to the dissection of the body of any criminal, where the same has been or shall be directed to be delivered up for such dissection by competent authority" (Davis 1955:368).

It can be argued that interment in the Dunning Farm Poorhouse Cemetery serves as a physical representation of an individual's isolation and disenfranchisement. Like criminals, paupers and the mentally disabled were viewed by many in the early and mid-nineteenth century as morally lacking (Klebaner 1964). Two classes of poor appear to have been distinguished: "'the honest, industrious, but unfortunate poor', and the 'idle and vicious'" (Klebaner 1964:384). "Despite the practical difficulties in the way of distinguishing between the two classes, the opinion of most citizens probably remained unchanged—that in the great majority of cases poverty could be traced to vice and served to be treated accordingly" (Klebaner 1964:385). Poor farms and poorhouses were built on the premise that hard work could reform and restore personal character (Katz 1986). Hence, regardless of the 1825 Act to prohibit the disinterment of the dead for dissection, it might be asserted that individuals buried at the Dunning Cemetery were less likely to find protection under the law.

Chicago's burgeoning medical field in nineteenth century also placed bodies slated for interment in Dunning Cemetery in jeopardy. Institutions such as Rush Medical College, founded in 1837, and the Cook County Hospital founded in 1857, employed physicians to serve the sick, injured, and disabled, as well as to teach medicine. For a time between 1863 and 1866, Cook County Hospital, finding itself at the brink of financial ruin, established a hospital at Dunning (Duis 1998). According to Bonner (1991:160–161), "After 1863, the county hospital was located with the buildings for the poor and insane at Jefferson [Dunning], being neither convenient nor adequate. Amerman (George K.) succeeded in getting himself elected in 1865 to the County Board of Supervisors and he promptly persuaded his colleagues to lease the premises of the city hospital as a county hospital… The county's charges were removed from Jefferson to the new hospital the following year." It is possible, although there are no records, that doctors and students at the hospital used the bodies of deceased poorhouse residents for dissection and practice.

While the State of Illinois legalized the appropriation of bodies of the poor for medical experimentation in 1885, this post-dates our section of the Dunning Cemetery by 15 years. Nonetheless, grave robbing as a means of obtaining bodies for dissection and practice, it appears, was common in Chicago during the years that the Dunning Cemetery was in use. An article published in the *Weekly Chicago Democrat* reports that "A scandal in 1857 revealed that the chief physician [of Dunning] exhumed freshly buried corpses of inmates under cover of the night, they reburied the coffins filled with rocks. The bodies were concealed in barrels, which were shipped to medical colleges for a payment of 20 dollars each" (Duis 1998). Excavation did not yield any evidence of body snatching, or grave robbing, associated with our section of the Dunning Cemetery, as recovered burial features yielded human bodies, often carefully laid out within grave cuts, not empty graves. We do, however, have ample evidence that bodies were being used for postmortem examination, with or without permission, prior to burial.

The types and nature of the postmortem alterations recovered during the Dunning Cemetery excavation suggest that bodies were not only being used for dissection, they were being used for medical practice. The transverse cut through the femur, for instance, recovered from Burial 017C fails to completely transect the anatomical element, displaying a small boney spur where the bone has been snapped to complete the transection. The orientation of the cut is also unusual, as it appears to have been made medio-laterally across the bone, rather than the more common antero-posterior orientation (Owsley 1995; Chamberlain 2013). The presence of an overlapping calvarial cut, noted in Burial 042M, that impacts the temporal and zygomatics, rather than avoiding them to preserve the integrity of the cranium and its contents, might also suggest the work of practicing medical students and professionals. Lastly, the circular incisions recorded on Burial 114A2, made by a trephine, appear multiple times in a single anatomical element and fail to completely penetrate the cortex. A wide range of trephines were available to the medical community in the mid-nineteenth century, and numerous examples of their use are described in American Civil War documents (see Echols 2014). Their use for the treatment of depression fractures and gunshot wounds to the crania suggest that the technique was complex and the results often poor (Bell 1814; Corson 1885; Preul 1997:78). Burial 114A2 displays multiple trephinations of an unusual anatomical element void of any recognizable pathological condition or trauma. The fact that the individual is nearly complete and lacks evidence of surgical intrusion on the cranium is also perplexing. We posit that it is likely that the bodies of these individuals were used for medical practice prior to burial.

The location of burials displaying postmortem alteration within the cemetery also warrants evaluation. One row of the cemetery, the third from the western margin, yielded two individuals with cut marks: Burial 042M with the calvarium cut, and 087W with a transecting cut of the left tibia. The burials do not appear to be associated with one another. That is, there is no archaeological evidence that the two individuals were buried at the same time. The third burial displaying postmortem cuts is 017C, located immediately west of 042M and 087W: within the fourth row from the western margin of the cemetery. Since spatial chronology of the cemetery cannot be determined, assessing whether these individuals were buried close in time to one another (for instance, when the County Hospital was located at Dunning) is impossible. What can be offered, perhaps, is that the spatial "clumping" of these burials is unlikely a random occurrence, and reflects definitive actions of doctors, students, overseers of the cemetery, and grave diggers.

Viewed as a whole, the placement within the cemetery of individuals with postmortem cuts offers another perspective. Although each of the four burial features containing postmortem cuts are integrated within rows containing bodies with no cut marks, each of the burial features appear as outliers (see Fig. 14.1). For instance, Burial 042M rests at the end of a row containing eight other burials to the south. Immediately north of Burial 042M, no burials or grave cuts were found. Burial 087W appears within a small cluster of burials, separated by over a meter from larger cluster of nine burials containing 042M. Burial 0114A2 rests at the eastern end of the excavated area: approximately 7 m away from row 4. The body marks the farthest northern margin of the excavated area. Hence, individuals displaying postmortem cuts can be visually interpreted as members of the poorhouse population, but their placement within the cemetery suggests that their bodies were singled out from others. Age at death and sex of the deceased do not appear to be factors guiding the decision to appropriate a body for medical use or practice, as the bodies of both adult men and women are found with postmortem alteration. Rather, it appears, that social isolation and disenfranchisement, few economic resources, and prevailing cultural attitudes towards poverty and mental illness contributed to the likelihood that a body would be illegally used for medical practice without legal recourse.

Conclusion

The Dunning Cemetery was excavated and analyzed 25 years ago. In spite of the limitations of working with incomplete data, new questions can be posed and answers postulated. The individuals recovered during the 1990 excavation of the cemetery likely died at the Dunning Poorhouse and Insane Asylum. Their bones are the embodiment of mid-nineteenth century social attitudes and political outcomes of poverty and mental illness. The cut marks upon their bones and the locations of their burial rest as symbols of the regard they were afforded during life. Our research suggests that destitute immigrants, the poor, handicapped, and the mentally ill did not have the sociopolitical or economic power to protect their dead from being taken for anatomical study or medical practice. Sappol (2002) confirms that it was not uncommon for those of greater economic means to feel it was the poor's duty to offer themselves to the professionalization of physicians as restitution for their dependence on taxpayers. We attest that viewing human remains through the lens of embodiment theory enhances our understanding of nineteenth century medical practice in Chicago and will support a growing understanding of the interplay between culture and the human body.

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Chapter 15
A Historical and Osteological Analysis of Postmortem Medical Practices from the Albany County Almshouse Cemetery Skeletal Sample in Albany, New York

Kim Lusignan Lowe

Introduction

Interest in skeletal samples from cemeteries to reconstruct social, historic, and demographic aspects of the past has increased in recent years (Saunders and Herring 1995; Grauer 1995). These analyses offer insight into how the population lived and how the individuals were treated after death. In 2002, the Cultural Resource Survey Program of the New York State Museum carried out excavations of the Albany County Almshouse cemetery, in which 1427 skeletons were exhumed. This cemetery was in use from 1826 to 1926 and included inmates of the almshouse, unclaimed individuals, and individuals from the nearby rivers and penitentiary (Phelps 1881). Almshouse interment and record of death ledgers also indicate that indigent Albany County residents unable to afford burial elsewhere and Albany Medical College specimens were also buried within the almshouse cemetery.

Within the almshouse skeletal sample, some individuals show prevalent postmortem cut marks on the skeleton. The primary goal of this paper is to investigate the techniques of dissection with respect to anatomical teaching at the medical college. The interest lies in the quality of the dissections and the locations of the cuts. The reasoning for this is to determine that the cuts were done within a teaching institution rather than a professional setting, a dissection versus an autopsy. As such, those individuals with postmortem cut marks in the skeletal sample from the almshouse cemetery are hypothesized to be cadavers that were acquired and utilized for dissection in the teaching of medicine at Albany Medical College and

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were also from the poor classes of Albany County, New York. A secondary goal of this paper is to determine if those buried within the cemetery are representative of the individuals from that time period.

Albany in the 1800s

In 1797, Albany became New York's state capital and with this new importance came an increase in population due to road travel. This travel doubled the population size and increased the commerce within the city. All the roads in one way or another led straight back to Albany. With Albany situated on the Hudson River, it became a port for the trade of lumber and flour. Other local industries growing were breweries, meat processing, tobacco rolling, book publishing, and cast iron production. With the invention of the steamboat and the Erie Canal, Albany soared to its height as a port city. Taking the land by storm was the invention of the rail; this allowed for easier and quicker movement of people and goods (McEneny 1998).

With this rapid expansion of people into the area also comes the spread of infectious diseases and the need for medical assistance. Albany still did not have a sewer system, the water came from wells, the streets were littered with livestock, and too many people were crowded into one small area; so there was no surprise that infectious diseases spread. In response to the need for a place to house the poor and sick, in 1826, the Albany almshouse, or the Poor House Farm, opened with 123 residents (Reynolds 1906; Munsell 1859). The almshouse was located in a large superblock called Alms House Square that contained 216 acres of land, which extended from Lark Street to Perry Street and then from West Ferry Street to the city line down south (Fig. 15.1) right across the street from Albany Medical School and Albany Hospital. A penitentiary, a pest house for those with contagious diseases, the almshouse (McEneny 1998; Munsell 1854, 1857) and the almshouse cemetery were also part of this superblock.

Almshouses were a place for the dependent and destitute, the mentally and physically ill, the able-bodied and disabled, and foreigners. They housed the elderly, prostitutes, alcoholics, the homeless, the insane, the disabled, and the mentally impaired (Rothstein 1987; Rosenberg 1987; Deutsch 1941). Almshouses provided care for the incapacitated and the city's most helpless and deprived, as they were not permitted within hospitals (Rosenberg 1987). Population within the almshouse increased as unemployment rose and with the cholera epidemics. By the end of the nineteenth century, over 100,000 people lived within Albany, most of them among the poor populations (Hughes and Lusignan n.d.). The Albany County Almshouse Cemetery was created at the western end of the Almshouse Square and became the final resting place for the unclaimed dead from within the city, the river, and the penitentiary (Phelps 1881). It has also been suggested that interred within the cemetery were indigent Albany County residents who could not afford burial elsewhere, Albany Medical College specimens, and almshouse inmates (Albany County Almshouse Interments 1880–1936).

Fig. 15.1 Map of the Cities of Albany and Rensselaer and portions of Bath and East Greenbush, New York in 1898 (modified from Sampson, Murdock, & Co., 1898) featuring the Almshouse square (highlighted area)

Albany Medical Practices History

Before the founding of medical colleges, students learned medicine by apprenticeship; they learned to identify sickness by reading books and following the instructor on his rounds. For additional training, most were required to seek coursework abroad. Boosted by the two cholera epidemics in 1832 and 1834 and with the assistance of doctors Alden March and James Armsby, Albany Medical College opened in 1839 in the donated Lancaster school house on Eagle Street with 57 students. It did not move to its present location at New Scotland Avenue until 1899.

Entrance into a medical school required proficiency in the natural sciences and Latin as well as 3 years of an apprenticeship and early coursework demonstrations centered on the treatment of fractures, lacerations, amputations, and obstetrics (Beebe 1983). The advancement in medical school curriculum did not begin until the late nineteenth century, when early medical schools such as Pennsylvania, Dartmouth, and New York College of Physicians implemented, on top of an apprenticeship, 3–4 months of formal lectures each year. Such courses included anatomy, physiology, surgery, midwifery, and the theory and practice of medicine (Shafer 1936). Clinical training, an important part of medical teaching, did not become integrated into the medical college curriculum until 1850 (Brieger 1972). Prior to this, clinical instruction was arranged through the apprentice's advisor and it was not uncommon for the student to go to the almshouse for his cases (Albany Medical College Circular 1838). The proximity of the medical school to the almshouse allowed for the inmates of the almshouse to provide experience to the students in the treatment of their ailments. Dr. March cited that the two main purposes of the hospital were to treat the helpless and to provide valuable teaching resources outside of lectures for the students (Beebe 1983).

Since anesthesia did not become available until 1846, the knowledge of surgery was limited to live specimens; so knowledge of the human body was gained through the use of cadavers. Beginning in the late nineteenth century, students partook in dissections as was the case in the Medical College of Georgia in 1896 (Blakely and Harrington 1997) and New York University in 1885 (Sappol 2002). Dissections involved the muscles, the organs, the bones, nerves, and arteries beginning with the stomach, then the legs, head, thorax, and arms (Shafer 1936). However, the major obstacle that stood in the way of teaching anatomy was the obtainment of corpses. Since the beginning of formal anatomical instruction, body snatching from the cemeteries of the poor had been the fundamental source of cadavers. Records indicated between 600 and 700 graves were robbed per year to sustain the medical colleges within New York City (Humphrey 1973). To deter the robbing of graves for cadavers, states began passing anatomy laws, which allowed the use of unclaimed bodies to be used for dissection at medical schools (Blakely and Harrington 1997; Richardson 1987; Shultz 1992; Haagensen and Llyod 1943). Massachusetts was the first to enact such a law in 1831, with New York following in 1854 (Humphrey 1973) and the rest of the United States by the 1920s. In New York, the anatomy act was called the "Bone Bill" and it gave medical schools the permission to dissect bodies of those unclaimed individuals who died in an almshouse or prison (Sappol 2002). This law continued to be used into the twentieth century and it provided that cadavers, those not claimed by relatives or friends within 48 hours, were to be delivered to medical schools for study (MacDonald 1964). The one thing that the anatomy act assured was that cadavers would come entirely from the lowest social classes (Humphrey 1973); after all, the poor owed a debt to society for providing them with the care they needed while they were alive (Sappol 2002).

Dissection Techniques

The method of dissection has not changed drastically over the years since the nineteenth century (McFarlin and Wineski 1997), so *Grant's Dissector* (Sauerland 1994) was used for a summary in the techniques of medical dissection.

Cranial cuts consist of the removal of the skullcap (calvaria) and the occipital wedge. The calvaria cut consists of saw cuts from the mid-temporal of one side, above the supraorbital margin, then to the other mid-temporal region, and continuing to 2 cm above the occipital protuberance (Sauerland 1994). Since a saw is used to make these series of interconnecting cuts, irregular saw cuts and false starts are common. An occipital wedge cut may complement the calvaria cut. Saw cuts extend from the lateral edge of the foramen magnum to the lambdoidal suture on both the right and left sides (Sauerland 1994).

Post-cranial dissection consists of a variety of different events; however, long bone, clavicle, and vertebrae dissection techniques are discussed here, as these are the procedures that are evident within the skeletal sample. First, dissection of the limbs does not require any skeletal dissection; however, sections of the femur can be removed for accessing hematological diseases, slices or blocks of bone for histological examinations, and for joint studies (Sheaff and Hopster 2001). Second, the clavicle is dissected at two points. First, there is a lateral cut made close to the trapezius and deltoid muscles and the second cut is close to the medial end of the clavicle (Sauerland 1994). And third, before removal of the spinal column, the sacrum should be removed by oblique saw cuts. Then a horizontal cut should be made in the lumbar vertebrae through the vertebral body and through the pedicles of the vertebral bodies from the lumbar to the cervical vertebrae (Sheaff and Hopster 2001).

Demography Assessment

The use of the state censuses in this paper is to determine whether or not the Almshouse skeletal sample was indicative of those that lived in Albany County during the same time period. Was there a difference in the age and sex of the skeletal sample? Was it similar? Did the skeletal sample accurately represent the individuals living in Albany?

The censuses that were available within the years the almshouse and the Medical College coexisted were limited to 1865 and 1875. These years were also chosen because other censuses failed to report mortality data. The Kolmogorov–Smirnov test was utilized to determine if the age distributions from the skeletal sample were similar to the census. The Chi-squared test was used to test the sex distributions between the same samples. For all data sets for these two tests, the level of significance was set to 0.05.

Material and Methods

The cemetery was first discovered in 1989 when construction workers were installing a boiler for the Wadsworth Center for Laboratories and Research (LoRusso 1990). The initial archaeological excavation in 1989 yielded about 30 burials and based on this excavation, it was estimated that about 200 additional burials would be impacted by the new construction. These burials were to be removed from this site prior to the building of the Center for Medical research by the Charitable Leadership Foundation. The land in discussion for this new facility was an empty undisturbed parcel behind the New Scotland Avenue Armory, which was located to the west of the Wadsworth Center. Salvage excavations on the grounds of the old Albany County Almshouse Cemetery took place in 2002 and interments were to be exhumed and reburied at Albany Rural Cemetery. Of the 1427 individuals excavated in 2002, 903 skeletons were in good enough condition to be included in this study. The sample contains 283 females, 441 males, and 179 individuals of unknown sex. Fifteen females, 30 males, and six of indeterminate sex show evidence of postmortem dissection cut marks. There could have been many more individuals for study; however, the Charitable Leadership Foundation halted further excavations in order for construction of the research facility to open on time.

After the removal of each burial, each skeleton underwent an osteological evaluation, which included skeletal inventory, age, sex, ancestry, measurements, and an assessment of pathologies. Due to the poor soil conditions at the site as a result of the infiltration of water, a variety of markers were utilized to determine age and sex since not all skeletal markers were available in all burials. Age determination was based on dental eruption and attrition, auricular surface and pubic symphysis morphology, signs of osteoporosis, and degenerative joint disease. Sex determination was made on the basis of pelvic morphology, such as the sub-pubic angle, sub-pubic concavity, and the angle of the sciatic notch. Due to the condition of some of the skeletons, sex determination was also based on cranial morphology, such as the shape of the mental eminence, the size of the gonial angle, the size of the mastoid, and the thickness of the supraorbital ridge (White 2000; Bass 1995; Buikstra and Ubelaker 1994; Steele and Bramblett 1988). Subadults, those with a median age of around 16, typically were not given a determined sex and age due to the lack of sexual maturity. However, one analyst attributed ages and sex to the three skeletons in question and should, hence, be considered estimates only.

Results

Skeletal Assessment

Of the 903 individuals in the skeletal sample from the Albany Almshouse Cemetery, 51 (5.65 %) exhibit postmortem cuts. Of these, 38 (74.51 %) have cranial cuts, nine (17.65 %) have postcranial cuts, and four (7.84 %) have both cranial and postcranial cuts. Males have the majority of post-cranial cuts and only females have both cranial and post-cranial cut marks (Table 15.1).

The most common cut seen in the crania from this sample is the calvaria cut, which is found in 19 (47.5 %) individuals. One variation of the cut consists of a lateral cut across the frontal bone which follows the temporal line and then travels either posteriorly to the lambdoidal suture found in two individuals (Fig. 15.2) or circumferentially around the occipital found in 12 individuals. One of these 12 individuals also shows an additional dissected component on the cranium, consisting of bilateral cuts on the occipital that extend from the lambdoidal suture to the foramen magnum, similar to the occipital wedge cut. There are also five skulls that show a typical straight calvaria cut with cuts a few centimeters above the supraorbital margin and occipital protuberance; however, many of these calvaria cuts are cut at more oblique angles or fail to connect at the occipital.

Fourteen individuals (35.0 %) also have fragments of bone that are suggestive of calvaria cuts including three with lateral frontal cuts, two with occipital cuts, and three with frontal and occipital cuts that suggest a circumferential cut across the calvaria. In addition to the fragmentary cuts, three individuals showed cut marks only on one cranial bone. One individual had only one piece of cranium that was cut obliquely and horizontally on the occipital. Another individual had an oblique cut to the parietals midway between the coronal and lambdoidal sutures and another individual had a fragment of a circumferential cut from one temporal region to the other via the occipital. Finally, three individuals had numerous fragments of bone with cut marks. One individual had horizontal and longitudinal cuts on both the left parietal

Table 15.1 Demographic data for individuals with dissection cut marks (M = Males; F = Females; Unk = Unknown)

Age	M	% M	F	% F	Unk	Total	% Total
<19	0	0.00	0	0.00	3	3	5.88
20–24	5	15.15	0	0.00	0	5	9.80
25–29	4	12.12	0	0.00	0	4	7.84
30–34	6	18.18	2	13.33	0	8	15.69
35–39	6	18.18	3	20.00	0	9	17.65
40–44	4	12.12	1	6.67	0	5	9.80
45–49	0	0.00	4	26.67	0	4	7.84
50+	5	15.15	5	33.33	3	13	25.49
Total	30	100.00	15	100.00	6	51	100.00

Fig. 15.2 B706 (Male, 28–44) is one variation in the calva cut, sometimes referred to as the V-shaped cut (with drill holes). Courtesy of New York State Museum, Albany, NY

and temporal bones. The second individual had two horizontal cut marks on the frontal, temporal, and occipital bones while the third individual had multiple fragments of frontal bone showing cut marks (Fig. 15.3).

There were seven (17.5 %) individuals that showed either abnormal cuts on the crania or abnormal calvarium cuts. Two individuals showed cut marks across the frontal and a cut mark across the parietals in the coronal plane just a few centimeters posterior to bregma. Two other individuals have similar cuts to those mentioned previously except the cut through the parietals is midway between the coronal and lambdoidal sutures. Another individual had the inverse, in which the cuts are just posterior to bregma, across the parietals, and horizontally around the temporal to the occipital. Another individual has a cut that is just posterior to the foramen magnum that extends to the temporal region and superiorly to the frontal bone. It also has a second cut that divides the lower portion of the frontal bone. The last individual is unique in that the first cranial cut extends from the left pterion region to the right temporal. Cut two is a U-shaped cut across the occipital from the left parietal near the temporal bone to the other temporal region.

Most post cranial evidence for dissection is represented by cuts on long bones (81.8 %), which include radii, ulnae, humeri, femora, tibiae, and fibulae. Most of these bones are cut transversely through the shaft of the bone. One femur has an unusual cut with a segment measuring 5.2 cm by 2.4 cm that is cut out of the shaft of the medial side of the bone (Fig. 15.4). Three other types of bones that have cuts on them are vertebrae, a clavicle, and a pelvis. The two vertebrae come from the

Fig. 15.3 B318A (Male, 50+) showing false starts. Courtesy of New York State Museum, Albany, NY

Fig. 15.4 B136 (Female, 40–45) has unusual femur cut. Courtesy of New York State Museum, Albany, NY

same individual. The cuts on the eleventh thoracic vertebra are cut medial–lateral through the lamina, while cuts on the second lumbar vertebra pedicle extend in the anterior–posterior direction through the superior portion of the lamina. Another individual shows a diagonal cut mark on the medial half of the clavicle. The last individual shows a cut on the ischium from the inferior to the acetabulum and on the anterior side near the ischial tuberosity.

Demographic Assessment

The results of the Kolmogorov–Smirnov ($p=0.05$) test between the 1865 and 1875 state censuses deaths and the skeletal samples are significantly different, suggesting a difference in age distributions between the samples.

Chi-square tests between the skeletal sample and the 1865 and 1875 state censuses indicate that the results are significantly different at the 0.05 level, suggesting a difference in the sex ratio between the samples [1865: $X^2=9.568$; df = 1; p $(0.05)\approx 3.841$; 1875: $X^2=12.704$; df = 1; p $(0.05)\approx 3.841$].

Discussion

Medical Representativeness

Medical dissection was necessary to understand the human body and as the nineteenth century progressed, medical teaching, especially of anatomy, increased with great earnest. The teaching of anatomy required the use of cadavers and corpses were obtained either legally or illegally. Legally, medical colleges in New York were allowed to use executed criminals after 1789, and the poor from almshouses after 1854; however, there were also cases of illegal obtainment of corpses through the robbing of graves. It was not unknown that wealthy individuals' graves were robbed but it was more common for individuals of poor standing to have their graves disturbed by grave robbers. Historic records of Albany, New York (Munsell 1858) recorded an incident in 1829 in which a vault in a Presbyterian cemetery was erected to protect the recently deceased individual from the grave robbers. Proof of grave robbing has also been unearthed in the Albany County Almshouse Cemetery Excavation, where a few coffins showed evidence of disturbance. The robbing of graves requires prying off the lid and lifting the corpse out by the neck (Blakely and Harrington 1997). Figure 15.5 shows such a disturbance in that the northern top of the coffin where the head lay has the lid boards crisscrossed as if they had been haphazardly replaced in haste, while the rest of the lid remained intact. Furthermore, the coffin was empty.

Fig. 15.5 B1519 disturbed coffin top. Courtesy of New York State Museum, Albany, NY

After 1854, when the "Bone Bill" was passed in New York, New York medical colleges were legally allowed to use unclaimed individuals from public institutions, which included the almshouse. Historic documents (Albany County Almshouse Record of Deaths 1880–1947) provide evidence that Albany Medical College was accepting cadavers from the almshouse and state penitentiary beginning in 1894. After dissection, the reburial of cadavers was left to the medical college's discretion, but most dissected remains were returned in coffins made of unplaned wood riddled with knots and without handles (Richardson 1987). Historical evidence (Albany County Almshouse Interments 1880–1936) indicates there were at least six incidents between 1890 and 1892 where Albany Medical College returned dissected individuals for burial to the almshouse cemetery. It is unknown how many individuals were returned for burial in each instance as the records only indicate that subjects from Albany Medical College were returned for reburial. However, there is a discrepancy between when Albany Medical College took bodies from the almshouse, 1894, and when they returned them for reburial, 1890, 4 years earlier than records said they took the bodies. This likely proves that Albany Medical College was getting bodies from the almshouse prior to when the records began in 1894.

Within the almshouse skeletal sample, 51 individuals were found to have cut marks consistent with postmortem dissection, surely not enough individuals to have provided adequate teaching material since the founding of Albany Medical College in 1839, but more than the records indicate were returned for burial. The differences between the historic records and the skeletal sample could suggest either a discrepancy in the records or that the dissected individuals were buried elsewhere or were disposed of by other means, such as cremation.

The locations of the cuts on the skeletal material in comparison to the instructions in a dissection manual show that the individuals with postmortem cut marks were dissected in conjunction with the teaching of anatomy especially since the individuals were not fully dissected as they would be in an autopsy. For one, in the removal of the spinal cord, the vertebrae are cut. This type of cut is also seen in the Albany County Almshouse skeletal sample. Second, in the examination of the shoulder, both the dissection manual and an almshouse individual have a cut to the medial end of the clavicle and third, in the removal of the calvaria. However, there are also instances in the cut calvaria where variations are seen in some individuals. The standard calvaria cut (Fig. 15.3) was found in five individuals from the Albany County Almshouse skeletal sample but there were also two other variations of the same cut, some which were misaligned and did not connect at the occipital protuberance. The two other variations in the calvaria cut offer evidence that the quality of the cuts varied, which also indirectly relates to the individuals who performed the cuts, that is, the medical students. The quality of the students' cuts are also seen when the saw has been realigned, leaving false starts on the bone (Fig. 15.3). Besides these irregularities, most cuts followed modern dissection techniques from *Grant's Dissector* (Sauerland 1994); however, the variations in the quality of these cuts most likely depended upon the skill of the medical student.

Another anomaly that was discovered on some of the crania was the presence of drilled holes, which suggests that the crania were rearticulated as a further teaching model (Fig. 15.6). Some professors also went to great lengths to get their hands on an individual with an unusual disease (Richardson 1987) for dissection or as a specimen in an anatomical museum (Sappol 2002), in which case a rearticulated skeleton would be useful. Four individuals show evidence of these drill holes, two of which have unusual circumstances: one has congenital syphilis, the other a gunshot wound. Three individuals have the drilled holes in the temporal region including one with wire connecting the two holes, and the third, the gunshot victim, has the drilled holes on the frontal and occipital bones.

Post-cranial bones, on the other hand, did not follow the modern techniques, as the long bones are rarely sawed in modern dissections. The skeletal sample contained a variety of long bone cuts. One individual was particularly interesting in that a section of bone was cut out of the femur (Fig. 15.5). Since modern dissection techniques only require femoral cuts for histological analysis, perhaps this is the reasoning behind this case. There were also multiple individuals that showed transverse cuts of the long bones (Figs. 15.7 and 15.8), and three in particular also had

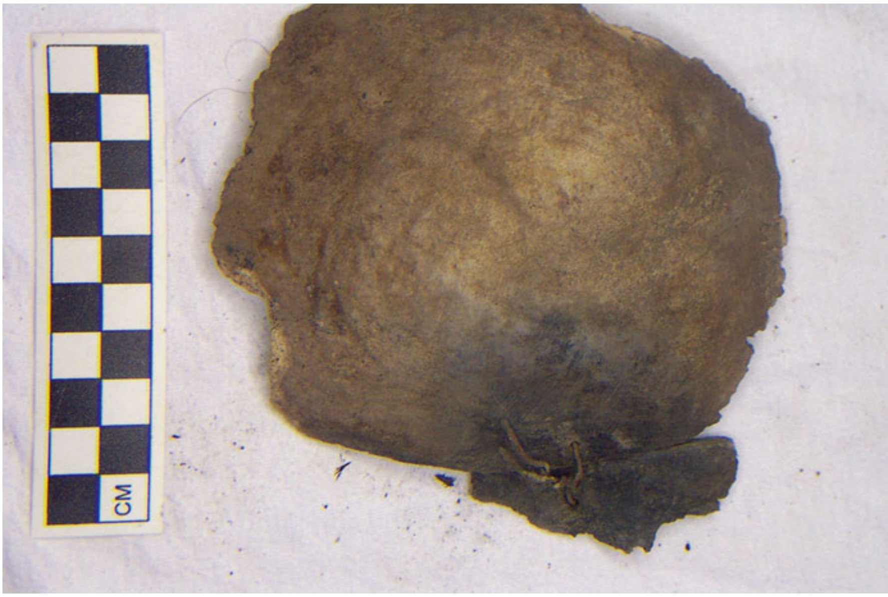

Fig. 15.6 B481 (Female, 30–40) showing autopsy cuts with drill holes and rearticulation with wire. Courtesy of New York State Museum, Albany, NY

Fig. 15.7 Severed long bones of B2179 (Male, 35–40). Courtesy of New York State Museum, Albany, NY

Fig. 15.8 Transverse cut of the tibia of B2006 showing saw cuts (Male, 27 years). Courtesy of New York State Museum, Albany, NY

amputations. Amputations within the dissection sample showed evidence of healing while dissection cuts did not. One individual was a double amputee of the lower legs, one had an amputated right leg, and the other individual had an amputated arm. These differences in the dissection of long bones may reflect the changes in the study of anatomy between the nineteenth and twentieth centuries.

Nineteenth and twentieth century dissection methods are also seen in the Charity Hospital skeletal sample in New Orleans (Owsley 1995). There were three types of cuts found in the skeletal sample from the Charity Hospital. The first is the autopsy cut, which results from sawing across the forehead, parietals, and occipital, avoiding the temporal region. The second is the medical experimentation cuts, which include learning the techniques needed for dissection. And the third is a surgical intervention, such as amputation (Owsley 1995). The Albany County Almshouse Cemetery skeletal sample also showed similarities to the cuts found at the Charity Hospital. Although some crania show circumferential cutting and few fail to cut the temporal bones, most crania show experimental cuts, such as false starts and misaligned cuts, consistent with an anatomical dissection. The third form of cut in the Charity Hospital sample, amputation, is found in eight individuals from the Albany County Almshouse skeletal sample, but only three also had postmortem cut marks. As such, these cut marks are more commonly associated with experimentation in the process of learning anatomy. Also, standard autopsy procedures are conducted to determine the cause of death; however, the deaths of older individuals are rarely questioned because of their age (Owsley 1995). The dissected remains at Albany

Fig. 15.9 B127 (Male, 18–23) showing trephination. Courtesy of New York State Museum, Albany, NY

almshouse cemetery, however, tended to have a greater number of older individuals, which suggests that fewer autopsy procedures were occurring and that more anatomy lessons were in progress.

Support of medical experimentation and dissection is also seen in the Medical College of Georgia skeletal sample. During a renovation of the basement in the original medical college building, human bones were found with postmortem cut marks. McFarlin and Wineski (1997) demonstrated through modern dissection at the Morehouse School of Medicine that the cut marks found on the bones from the Medical College of Georgia were similar in appearance to modern dissection cut marks, inclusive of false starts. Those bones found cut in the almshouse dissection sample closely relate to the bones found cut in the Medical College of Georgia sample in respect to the types and locations of cuts.

Also similar to the Medical College of Georgia skeletal sample, one skull in the almshouse skeletal sample shows evidence of a trephination with a coring tool. This individual has no other dissection cuts but has two circular overlapping cuts on the right parietal with one cut showing some signs of healing (Fig. 15.9). In the Georgia skeletal sample, McFarlin and Wineski suggest that the unhealed trephination was likely done postmortem in the practice of surgical procedures. The Albany almshouse individual either had the trephination after death or right before he died, as the second cut has no indication of healing. As with the Georgia skeletal sample, the Albany skeletal sample shows that postmortem dissection was occurring in the nineteenth century.

Age and Sex Representativeness

The determination of age-at-death of the skeletal sample produced results that were not consistent with the mortality data of either the 1865 or 1875 state censuses. The 1865 and 1875 mortality data suggest that the majority of deaths for that specific year were children under 4, followed closely by adults over 50. This is a different pattern to that seen in the almshouse skeletal sample. The Albany County Almshouse Cemetery sample had few children under the age of 19 and a large number of adults over 50 years of age. A typical human age pattern for mortality is high for infants, declines around 5–10 years, and then begins to increase again around age 40 (Gage 2000).

Examinations of the Almshouse Interment Records indicate that the number of infants interred in the almshouse cemetery has been underrepresented. Records show that between 1886 and 1926, approximately 28 % of interments were stillborns, infants, and young children under 13 (Seinfeld n.d.), indicating that 252 of 903 individuals could be children, more than twice the estimate of 114. These differences reflect either the preservation quality of infants and children or the fact that children were buried elsewhere. Records indicate that an orphanage was contemporaneous to the almshouse for some time (Phelps 1881) and it was possible that an orphanage graveyard existed near the almshouse property.

The skeletal sample at the Albany County Almshouse Cemetery was disproportionately male (61.07 % male; 38.93 % female). While the male to female sex ratio in the skeletal sample is approximately two to one, the mortality data of the 1865 and 1875 state censuses indicate an approximate one to one sex ratio. The almshouse skeletal sample also had 176 individuals of unknown sex, and it is near certainty that some of these unknowns were females. It has also been suggested that osteologists tend to overestimate males in archaeological samples (Larsen 1997). However, if the ratios are correct, it might suggest that more males were in need of almshouse care than females. Another suggestion is that more males were buried within the almshouse cemetery from other areas such as the penitentiary or the streets, further suggesting that more males were in poverty than females. Also, the preponderance of males in the almshouse sample in respect to the mortality data of the 1865 and 1875 state censuses could indicate that the growth in population and urbanization resulted in the need to find shelter for these growing numbers and most men ended up in the almshouse for support.

Conclusion

The analysis of the locations and the quality of the cut marks on the skeletal evidence from the Albany almshouse skeletal sample and comparisons to the cut mark analysis of the Medical College of Georgia skeletal sample suggest that 51 individuals of the Albany almshouse skeletal sample were used by Albany Medical College in the nineteenth century. Furthermore, evidence of grave robbing from the almshouse cemetery also provides confirmation that those being exploited in the teaching of anatomy were from the lower social classes.

Skeletal samples, due to a number of variables including preservation, do not always form a cross section of the living population, but rather are skewed in age, sex, or other factors (Waldron 1994). Kolmogorov–Smirnov and Chi-square tests indicate that the skeletal sample is not representative of the mortality data for the 1865 and 1875 New York State Censuses for Albany County. This is perhaps expected as the cemetery spans about a century, so to assume that one or two census years is similar to the cemetery is unreasonable. It is also unknown if the skeletal sample itself is representative of the total number of individuals buried in the cemetery as an estimated 2500 more burials remain on the property (Hughes and Lusignan n.d.). Plus, individuals from other counties in New York could also have resided within the Albany County almshouse. After 1824 when the Yates Report (1971) required counties to build almshouses and stopped the shipping of indigents back to their home county, individuals could receive aid in any county.

In conclusion, the Albany almshouse cemetery was the final resting place for the inmates (men, women, and children) of the almshouse along with individuals from the penitentiary, the rivers, the streets, Albany Medical College cadavers, and individuals who could not afford burial elsewhere.

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Chapter 16
Conclusion: The Anthropology of Dissection and Autopsy

Kenneth C. Nystrom

Skeletal evidence of dissection and autopsy is not as rare or uncommon as one may think. Remains have been recovered from a wide range of contexts including cemeteries, hospital cemeteries, privies, wells, and trash middens. In the United States, the evidence spans over 300 years, from some of the earliest colonial episodes (1604–1605, Chap. 2) to the mid-twentieth century (Chap. 9). The chapters in this volume illustrate the potential these data have for contributing to our understanding of the connections between the development of the medical profession, social marginalization, inequality, personhood, and the body.

In the last two decades, bioarchaeologists have made contributions to this topic from several different perspectives. Broadly, research on the skeletal evidence of postmortem examination can be grouped into three categories: descriptive/paleopathological, medical historical, and social bioarchaeology/biocultural. A large portion of the literature considers the evidence relative to medical history, including a number of reports from Great Britain (Anderson 2002; Boston et al. 2005, 2009; Brickley et al. 1999, 2001; Chapman 1997; Hillson et al. 1998; Hull et al. 2003; Henderson et al. 1996; Miles et al. 2008; Mitchell et al. 2011; Western and Bekvalac 2015), Canada (Pfeiffer et al. 1989), Poland (Bugaj et al. 2013), France (Signoli et al. 1997; Valentin and d'Errico 1995), and Western Europe (Charlier et al. 2014). In the United States, in the early 1990s, three reports appeared that were principally historical in focus, discussing the skeletal evidence relative to what was known regarding medical practices at the time; Wesolowsky's (1991) description of material from the Uxbridge Almshouse, Mann and colleagues' (1991) discussion of material recovered from a privy in Annapolis, Maryland, and Owsley's (1995) presentation of evidence from the Charity Hospital in New Orleans.

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The contextualization and interpretation of results using various social theory frameworks allows the establishment of connections between skeletal evidence and broader cultural and historical processes. While this clearly involves examining the lived social experience, researchers are also approaching the evidence of postmortem examination from a biocultural perspective. Drawing from archaeological and sociological treatments of the body and embodiment, and the recognition that death is not the end of social existence, researchers are considering the extension of social experience after death (e.g., Baadsgaard 2011; Buikstra et al. 2011; Crandall and Martin 2014; Tung 2014). As social bioarchaeology, this research attempts "to transcend the skeletal body into the realm of lived experience and to make a significant contribution to our understanding of social processes and life in the past" (Agarwal and Glencross 2011: 3).

The first, and most substantive and holistic, set of analyses that could be considered biocultural/social bioarchaeology is the Blakely and Harrington (1997) edited volume *Bones in the Basement*: *Postmortem Racism in Nineteenth-Century Medical Training*:

> "Our multidisciplinary approach required a theoretical framework that was not narrowly defined. At the outset, we realized that the research fell into three divisions of scholarship in the field of historical archaeology: scientific (or generalizing), historical (or particularizing), and humanistic (or aesthetic)" (Blakely 1997: 14).

Blakely and the contributors to the edited volume strove to combine processual and post-processual approaches to archaeology. As such, the research included forensic skeletal and artifactual analyses (e.g., Duncan 1997; Harrington 1997), dietary reconstruction based on faunal analysis and trace elements (Dillingham 1997; Terrell and McFarlin 1997), as well as ethnographic studies (Capozzoli 1997; Curtis-Richardson 1997) of medical students and Augusta residents. Ultimately, however, Blakely (1997: 18, emphasis in original) notes that while they "were able to apply aspects of both [processual and post-processual] to the total research program" they "were seldom able to combine them *within* components of the project." Still, the volume remains a seminal contribution to the study of postmortem examination in the United States. In this regard, the volume contributes to medical history (e.g., Duncan 1997; McFarlin and Wineski 1997) as well as addressing more anthropological questions related to the study of structural racism and the use of African American and the indigent for anatomical study (e.g., Blakely and Harrington 1997; Jackson 1997). This historically grounded, biocultural perspective continues to influence research on postmortem examination (e.g., Blakey 2004; Davidson 2007).

All three approaches discussed above manifest, in varying degrees, in the contributions to this volume, reflecting the potential of these data for addressing a wide range of historical and anthropological questions. While all of the chapters provide some degree of historical contextualization, there are contributions that speak more directly to medical history and the development of the medical profession and education (e.g., Chaps. 2, 4, and 7) while others are grounded in the biocultural paradigm (e.g., Chap. 15) or more explicitly incorporate social theory (e.g., Chaps. 5, 6, and 14).

Volume Themes

There are two themes that run through this volume that I would like to focus on briefly as they speak to how these data can be employed to address questions of broader anthropological significance. Dissection and autopsy can be viewed as transformative acts that inform on the creation and destruction of social identity and as the materialization of social inequality.

The postmortem examination of bodies was a transformative act, for the medical profession, the medical student, the individual/subject, and the body. With the proliferation of medical schools during the 1800s, anatomy courses were one of the most fundamental aspects of medical education and the reputation and survival of medical schools depended upon being able acquire a steady source of anatomy specimens. Schools competed for access to cadavers and advertised to students their ability to supply specimens. As quoted by Owsley and colleagues (Chap. 7: 145), the Medical Department of Hampden-Sydney College (later the Medical College of Virginia) extolled the virtues of their location for "While at Richmond, not only is the supply of subjects ample, but the temperature is such as to allow dissection to be continued without interruption from October until March."

While dissection and gross anatomy courses were the *sin qua non* of medical education in the eighteenth and nineteenth centuries, the nature of the medical profession and the centrality of dissection to medical education curricula, has transformed. In modern medical education, the major benefits of dissection includes gaining a multidimensional understanding of the organization of the human body, appreciation of anatomical variability, learning the basic language of medicine, establishes the primacy of the cadaver/patient, and peer group/team learning. Beginning in the 1970s, however, medical education was critiqued for an overreliance on "data collection, memorization, and regurgitation" and on didactic teaching (Aziz et al. 2002: 24). The centrality of learning anatomy through dissection to medical education began to be questioned. Additionally, with the growing importance attributed to what were considered the "more clinically relevant disciplines of molecular and cell biology, microbiology, immunology, pharmacology and the neurosciences" (Aziz et al. 2002: 22), medical school curricula modified the amount of time devoted to gross anatomy. In fact, while gross anatomy is still considered one of the most basic aspects of medical education (Cottam 1999), there has been a significant reduction in the amount of time spent in the dissection laboratory, from 338 h in 1939 (Eldred and Eldred 1961) to 182 h and 165 h in 1994 and 1999 respectively (Collins et al. 1994; Cottam 1999). Medical school curricula continue to adapt with some teachers advocating for the increasing use of prosected specimens, 3D reconstructions, medical imaging, and living bodies (McLachlan 2004; Topp 2004).

For the nineteenth century medical student, gross anatomy courses represented the most significant component of their education. Anatomical knowledge was not only considered to be the basis of medical professionalism, it was also the benchmark of a new social identity. The dissecting room was characterized as a dangerous, even liminal, space where the anatomist conquered the dead body. The corpse was considered to be dangerous, putting the aspiring medical student in both physical and moral jeopardy as it could produce noxious gases and fluids that could poison medical students and the community, while also fostering desire, necrophilia, and the rejection of religion (Sappol 2002). Through encountering and conquering the dead body, the medical student was marked socially and professionally; "dissection and grave robbing were rituals, mysteries, that served to bond a group of young men together in opposition to the outside, rituals that marked a passage from protected youth to masculine adulthood" (Sappol 2002: 81). Even today, encountering a cadaver and engaging in dissection continues to be a key transformative process for medical students today (Charlton et al. 1994; Horne et al. 1990; Moxham and Plaisant 2007; O'Carroll et al. 2002).

The chapters by Chapman and Kostro and Hodge and colleagues speak to this performative aspect of engaging in dissection or autopsy and the intertwining of socioeconomic status, medical knowledge, and the establishment of medical authority within the United States. These authors remind us that as much as previous researchers have considered the impact of the performance from the perspective of those that were dissected (Sappol 2002; Nystrom 2011), it is also necessary to consider how "Medical expertise was created and transmitted through embodied performance in lectures, study, and specimen preparation" (Chap. 6: 125).

The transformation "experienced" by the individual and their body is the most dramatic, transitioning from subject to object, beginning before the individual reached the dissecting table. With the expansion of the American medical education system during the nineteenth century, the dead body was transformed into a commodity, something that could be bought and sold. The market in dead bodies could be quite lucrative, with interregional networks transporting bodies from New York to New England, mid-Atlantic, and Southern states (Sappol 2002).[1] Writ large, the dehumanization and commodification of the corpse "also served as a metaphor for the erasure of the humanity of the working people, whose labor was also extracted and reduced to the status of a commodity. The fact that the vast majority of cadavers were working-class secured the connection: The anatomical narrative of body snatching and the body trade was a parable of capitalism" (Sappol 2002: 320–321).

The medical education system emphasized and encouraged a clinical detachment that resulted in the erasure of individuality and the objectification of the dead body. Several authors in this volume, as well as other researchers (e.g., Hull et al. 2003), document and discuss how individuals were transformed, their bodies becoming teaching tools, the "parts" and "preparations" of the anatomy lecture that could be removed and "checked-out." Hodge and colleagues (Chap. 6: 124) engage with the "relationship between the treatment of dead bodies and the creation or destruction of personhood" as bodies and body parts were "prepared" to serve as instructional

[1] See the discussion by Nancy Scheper-Hughes (2011) on the modern commodification of the dead body.

tools. Muller and colleagues (Chap. 9: 188) document how the skeletal collections became datasets, informing "studies of human variation, health and disease, growth and development, and forensic identification."

In many instances, this transformative process culminated in the disposal of the anatomized human remains in basements, dry wells, trash-laden fill/midden, privies, and in backyard pits. These locations likely served as a convenient and expedient disposal sites for unwanted, or even illicit, material. The transformation into waste is reinforced by other associated material including animal remains, ink bottles, specimen jars, beer bottles, ceramics, clothing, and a wide variety of scientific instruments (Chaps. 3 and 7; Duncan 1997; Hodge 2013; Hull et al. 2003; Mann et al. 1991). While the disposal of the dissected material may reflect expediency, it also speaks to the status of the deceased: "To anatomy professors, students, and grave robbers at the Medical College of Georgia, the corpses were natural objects used as specimens—commodities utilized as teaching aids before becoming trash" (Blakely 1997: 16).

It is well established that the bulk of the cadavers used in medical school anatomy courses during the course of the nineteenth century came predominantly from those that could not prevent their bodies from being used in this manner: the poor, almshouse inmates, prisoners, immigrants, and African Americans (Halperin 2007; Humphrey 1973; Richardson 1987). With the notable exception of the work by Blakely and Harrington (1997), what distinguishes more recent analyses is the explicit engagement with structural violence and how this framework could contribute to our understanding of dissection and autopsy in the United States (Nystrom 2014).

Dissection has long been associated with marginalized social status. First employed as a form of postmortem punishment to deter crime, its association with social transgression was perpetuated and extended by the anatomy laws of the nineteenth century as it became a means of deterring indigence. In some ways, many of the authors in this volume touch on how structural violence may be used as a framework from which to interpret this type of evidence; though they may not explicitly articulate their research in this manner, their analyses and discussion highlight the socially marginalized status of the people that were dissected. Other authors explicitly ground their research within the concept of structural violence.

The contributions by Dougherty and Sullivan and Muller and colleagues (see also Nystrom 2014) take their engagement with structural violence one step further. These authors call upon bioarchaeologists to recognize and acknowledge how our own research may ultimately be an extension of the underlying social inequalities that facilitated dissection in the first place. Dougherty and Sullivan highlight how dissection was only the first step in a process of transformation from subject to object; the excavation and recovery of skeletons is resurrection in the name of a new science (Highet 2005). These authors argue that "… it must be acknowledged that, like the corpse for the nineteenth century anatomist, the disinterred skeleton is the currency of the bioarchaeologist" which are "inventoried, analyzed in occasionally destructive ways, photographed, and placed on display in publications and conferences" (Chap. 10: 230). Similarly, Muller and colleagues (Chap. 9: 198) caution anthropologists to consider how "the standards for anthropological measurements and identification have been largely developed on the bodies of those devalued and/

or discarded by society" and to "reflect upon our potential contributions to the perpetuation of structural violence, avoiding an uncritical privileging of scientific discourse and methodology." A critical, biocultural approach requires that the researcher be cognizant of the position of power they hold relative to the remains they are investigating (Zuckerman et al. 2014) and to strive to avoid perpetuating the culturally sanctioned and institutionalized inequality that fostered the acquisition of these bodies in the first place.

While the use of unclaimed bodies began to decline in the 1930s, particularly with the passage of the Uniform Anatomical Gift Act in 1968 (Garment et al. 2007), one recent estimate indicates that 20 % of cadavers in the United States and Canadian medical schools are unclaimed (Dasgupta 2004) with several states (i.e., Maryland, Texas, North Carolina, Pennsylvania, Michigan) automatically offering them to state anatomy boards (Jones 2012). A news article published (O'Reilly 2011) in the *American Medical News* quoted one state official from Maryland as saying that they receive 200 unclaimed bodies per year. The use of unclaimed bodies continues to be prevalent in other countries as well. In India, "mostly unclaimed bodies are handed over to anatomy department for teaching and research purpose" (Rath and Garg 2006: 331). Osuagwu and colleagues (2004) report that over a three year period, that 78.6 % ($n=22$) of the bodies dissected at the Department of Anatomy at the University of Ibadan, Nigeria were criminals that were killed by law enforcement officers, while 21.4 % ($n=6$) were the unclaimed bodies of car accident victims. Gangata and colleagues (2010) sent out a survey to 48 medical schools; of the 14 schools that responded, unclaimed bodies from hospitals, prisons, and the bodies of dead bandits constitute the main source of cadavers. As summarized by Gangata and colleagues (2010: 174) the use of unclaimed bodies "disproportionally affect people who were homeless and poor, criminals, people with fewer social links, and social outcasts."

The main ethical issue raised by Jones and Whitaker (2012) concerning the continued use of unclaimed bodies to teach anatomy is autonomy (the right to choose the final disposition of your remains) and informed consent. While it is legal to use these bodies for teaching and/or research, Jones and Whitaker (2012: 247, 249) contend that "their legal legitimacy transitioned into their ethical legitimacy" and that while "anatomists may use unclaimed bodies for wholly legitimate ends in both research and teaching, the legitimacy of these ends does not justify the ongoing use of unclaimed bodies." In the authors' opinion, in the absence of informed consent the use of unclaimed bodies opens the door to "a wide range of practices, including ethically dubious ones …" (Jones and Whitaker 2012: 250–251).

Bioarchaeologists working in prehistoric and historic contexts also need to consider how this principle of informed consent influences their research. Zuckerman and colleagues (2014), drawing on the concept of embodiment, advocate for a relational ethical principle that would guide the analyses of human remains that represent those that were oppressed during life and those that were discriminated against, socially marginalized, and disenfranchised. The authors argue that researchers should "… explicitly engage in an ethics of social responsibility, wherein they would explicitly recognize that skeletons are not inert archives of information but are, symbolically, participants in the research process whose values and interests must be recognized" (Zuckerman et al. 2014: 517).

The surge in research over the last decade that examines skeletal evidence of dissection or autopsy reflects the application of increasingly sophisticated methodological and theoretical approaches that cross the disciplines of archaeology, bioarchaeology, anthropology, and social history. Undoubtedly, examples of this type of evidence from a variety of contexts will be discovered in the future. As we move forward, we need to carefully approach the ethical implications of such research, when the mere publication of results could be construed as potentially violating the principle of informed consent. Many of the contributions to this volume are based on skeletal material that represents the remains of oppressed and discriminated groups. Is there any redeeming value then to this type of research? Is it possible to simultaneously conduct research on skeletal remains of marginalized groups without perpetuating the social injustice that led to their dissection? Perhaps there is value in this research in that it increases the visibility of how dissection was, and continues to be, linked to social inequality. The contributions to this volume illustrate how institutionalized racism and inequality operated to create categories of people that had no power or recourse. One of the most insidious aspects of structural violence is that it is so much a part of our everyday existence that it becomes invisible and normalized. The nineteenth century anatomy laws that legalized the dissection of unclaimed bodies began this process of normalization and continues to be a significant ethical issue. As anthropologists, we are in a position to examine the impact of discrimination and marginalization and to connect past evidence with what is occurring today.

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