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Finding Those Once Lost: The Analysis of the Potter's Field at Woodland Cemetery, London, ON

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Finding Those Once Lost

The Analysis of the Potter's Field at Woodland Cemetery, London, ON

L. A. Hope Atkinson , Cameron J. Beason, Casey E. K. Boettinger, Ed Eastaugh, Teegan Muggridge, Nicole K. Phillips, Lauren S. Poeta, Émy Roberge, David Seston, and Isabella V. Vesely

Edited by Andrew J. Nelson

Western

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I. Forward

Mortuary archaeology is the archaeological study of death and burial. In North America, the anthropological, cross-cultural, and deep temporal perspectives are employed (cf. Martin et al. 2013a). The myriad ways that societies deal with death are the product of complex and intertwined social, economic, and environmental factors such as class, gender, ethnicity, subsistence practice, and social complexity, to name a few. Therefore, the study of mortuary rituals sheds important light on social complexity and organization. This makes it an excellent topic for an advanced course in a Department of Anthropology. The research described in this report is the result of a group project for an honours level undergraduate and graduate course entitled Anthropology 4493G/9104B; Advanced Special Topics in Anthropology/Advanced Bioarchaeology; Mortuary Archaeology, which was taught in the Winter Semester of 2020. The syllabus for the course is included in this report as Appendix 1.

Mortuary archaeology typically involves the excavation of mortuary contexts of societies from prehistory. However, its methods and theory are equally applicable to historic and even forensic contexts. The exercise of analyzing one's own culture in the recent past is an important test of our approaches and interpretations and it forces one to be reflexive, confronting assumptions of "how things are supposed to work" in one's own culture. Nowhere is this truer than when considering the context of a potter's field, the final resting place of the poor, the marginalized, and all others who lived – and died – on the fringes of society.

This project arose from discussions between the course instructor, Andrew Nelson, and staff at Woodland Cemetery in London, ON, including Roula Drossos (director) and Meagan Fillmore and Thomas Sayers (public historians and archivists), that began in the spring of 2019 as

the course was being prepared by Nelson. The objective was to design a class project that would have a practical, hands-on component for the students and would also make a meaningful contribution to the Cemetery. Discussions continued into the fall of 2019, gradually coalescing on the topic of remote sensing in November of that year. The Department of Anthropology at Western is lucky to be well equipped with remote sensing equipment and the expertise of Ed Eastaugh, the Department's Bioarchaeology Lab Manager. Was there an area of the cemetery that was unmarked that might contain graves?; and would it be helpful for the Cemetery to have a survey of that area? The answer was a very enthusiastic one: *the potter's field!*

This project is the latest in a series of collaborations between Woodland Cemetery and Western University. Since 2015, students from Western, initially under the direction of former director Paul Culliton, have undertaken projects at Woodland. For instance, in 2018, Culliton obtained funding from the Canada Summer Jobs program to involve Western students Levi Hord, Leah Abaza and Thomas Sayers in the creation of a walking tour for the Cemetery, featuring the potter's field. This work was featured by the CBC (CBC, 2018) and Western News (Cheater, 2018), and led to the flyer, included here as Appendix 2, entitled *Lost and Found: Untold Stories of from Woodland's "Potter's Fields"* (cited in this report as Abaza, 2018). Thus, a firm basis was laid for further work to be done on this subject.

In 2017-2018, students in the Department of History's Public History program at Western took on the Woodland Cemetery as their class project under the guidance of Dr. Michelle Hamilton. Their result, cited here as Brash et al. (2019), is a comprehensive report of Woodland Cemetery's history and the important role it has played in the London community since its opening.

The combined and sustained efforts of the Woodland Cemetery History team were recognized by a 2019 London Heritage Award from the Architectural Conservancy of Ontario London Region and Heritage London Foundation (Van Brenk, 2019, Sayers pers. comm.).

The specific topics to be covered by the 2020 Mortuary Archaeology class group project emerged during discussion in the early weeks of the winter semester, as the students became more familiar with the general area of mortuary archaeology and the topic of potter's fields. Fillmore and Sayers visited the class on January 20th, 2020, to present a power point presentation, outlining the subject, and what was known about it (cited in this report as Fillmore & Sayers, 2020). This presentation helped to frame the problems and possibilities for the students. The students then developed their topic areas for the remainder of the semester.

We were very lucky with our timing as we were able to perform a day of remote sensing in a very narrow window of opportunity between the melting of the snow, and the lockdown of the University and community as a result of the COVID-19 pandemic. We had the class out to the potter's field site in two shifts on Sunday, March 8th, 2020, during which we were able to perform ground penetrating radar scans over the southern 60-meters of the potter's field area. In addition, we also employed magnetic susceptibility on a 10-meter section. Unfortunately, this did not allow us to cover the full extent of the potter's field area; the plan was to return for another day of survey to extend our coverage. However, by March 17th, 2020, the provincial government declared the COVID-19 State of Emergency, and Western University closed the campus to shift to 100% online instruction on March 20th, 2020, in order to finish the winter semester. Thus, we were unable to return to complete the survey. However, it is still our goal to finish the job!

Archival work was also affected by the COVID-19 shut down. Preliminary inspections of the archives in the London Room of the London Public Library and at the Diocese of Huron

Archives were accomplished in early March, but the State of Emergency prevented return visits. Fortunately, during the final assembly of this report, several colleagues generously shared information they had gathered for other projects. See Acknowledgements for details.

The specific topics chosen by each student, and the theoretical orientation they reveal are presented in Section 1.1 of this report. These topics contextualize Woodland Cemetery's potter's field within the history of the cemetery and its predecessors, and 19th century mortuary practices in Ontario and North America, including other potter's fields. Theoretical issues such as social death and the role of women and children in archaeological and historical analyses are included. Finally, issues such as the decomposition of the body, taphonomy, and the workings of remote sensing and its interpretation are presented. The final product is a map of the unmarked graves in the southernmost 70-meter stretch of the potter's field.

The detailed analysis of the remote sensing data is presented in Section 7 of this report. We initially had great concerns that the tree roots and ground conditions would make it difficult to gather meaningful results. However, the final product was successful beyond our expectations. Ed Eastaugh's comment when he first presented the results to Nelson was "There's no room at the inn!" The map reveals a complex pattern of grave clustering, aligning, and of gaps and of the variable depths of burials. When placed in the context of what is known from archival documents, this data sheds important new light on the early days of Woodland Cemetery, and the movement of burials from (the third) St. Paul's Cemetery between 1880 and 1886.

This project has been an excellent University-Community collaboration, the latest of several successful collaborations between Western and Woodland. It also provided an extraordinary learning opportunity for this group of students. It is very rare to have access to a research project such as this, and to the sophisticated set of analytical tools that we have in our

Department. But it is the students themselves and the great deal of work they put into this project (particularly the three graduate students who coordinated the report assembly) that makes for a remarkable report.

II. Acknowledgments

We must start by acknowledging the staff at Woodland Cemetery, including Roula Drossos (manager) and Meagan Fillmore and Thomas Sayers (public historians and archivists) for giving us permission to undertake this project and for their ongoing collaboration regarding the cemetery's history and archival material, as well as their help with research and preparations for our fieldwork day. Levi Hord also provided important contextual information on the potter's field walking tour project. Many thanks to Meagan for allowing us to use her photo for the cover art and in Figure 14 and to Leah Abaza and Levi Hord for allowing us to include the brochure for the walking tour of the potter's field. Former cemetery manager Paul Culliton helped to provide context to the ongoing Western-Woodland collaborations. Other staff at Woodland, including Eric Venesoen (supervisor), and the groundskeepers were also very helpful during our visits to the Cemetery.

Michelle Hamilton and Mike Dove of the Department of History, Western University, were very helpful in terms of directing inquiries, providing information about previous research, and providing a copy of the Brash et al. (2019) report.

Initial access to archival material was facilitated by Anne Quick, Archivist at Archives and Special Collections, Weldon Library, Western University and John Lutman, Archivist at the Diocese of Huron Archives.

1. Introduction

A potter's field, also referred to as a pauper's graveyard, indigent cemetery, free ground or pit grave, is a place in which the indigent, unknown, and ostracized dead are buried. Potter's fields were common in North America in the 19th century and existed as either a stand-alone cemetery or part of another (Willis, 2018). MacLean and Williams (2009) provide a definition in their *Encyclopedia of Death and the Human Experience* that encompasses the variety of individuals buried in potter's fields, noting that, "…potter's fields have become the final resting places of those whose remains were never identified along with those who died in prisons, hospitals, almshouses, workhouses, orphanages, in isolated medical colonies or other public facilities that warehouse individuals." (p. 179-180).

The following report presents the results of archaeological and archival research on the potter's field located at Woodland Cemetery in London, Ontario (see Figure 1). The research was conducted from January to May of 2020 by three graduate and six undergraduate students of bioarchaeology from the Department of Anthropology at the University of Western Ontario as a group project for a course in Mortuary Archaeology. The students were under the instruction and supervision of Dr. Andrew Nelson and Ed Eastaugh, also of the Department of Anthropology. The project arose from consultations with staff at Woodland Cemetery to help increase their knowledge of their potter's field as their historical and physical information about the site was limited.

Figure 1

A base map showing the locations of key features discussed in this monograph.
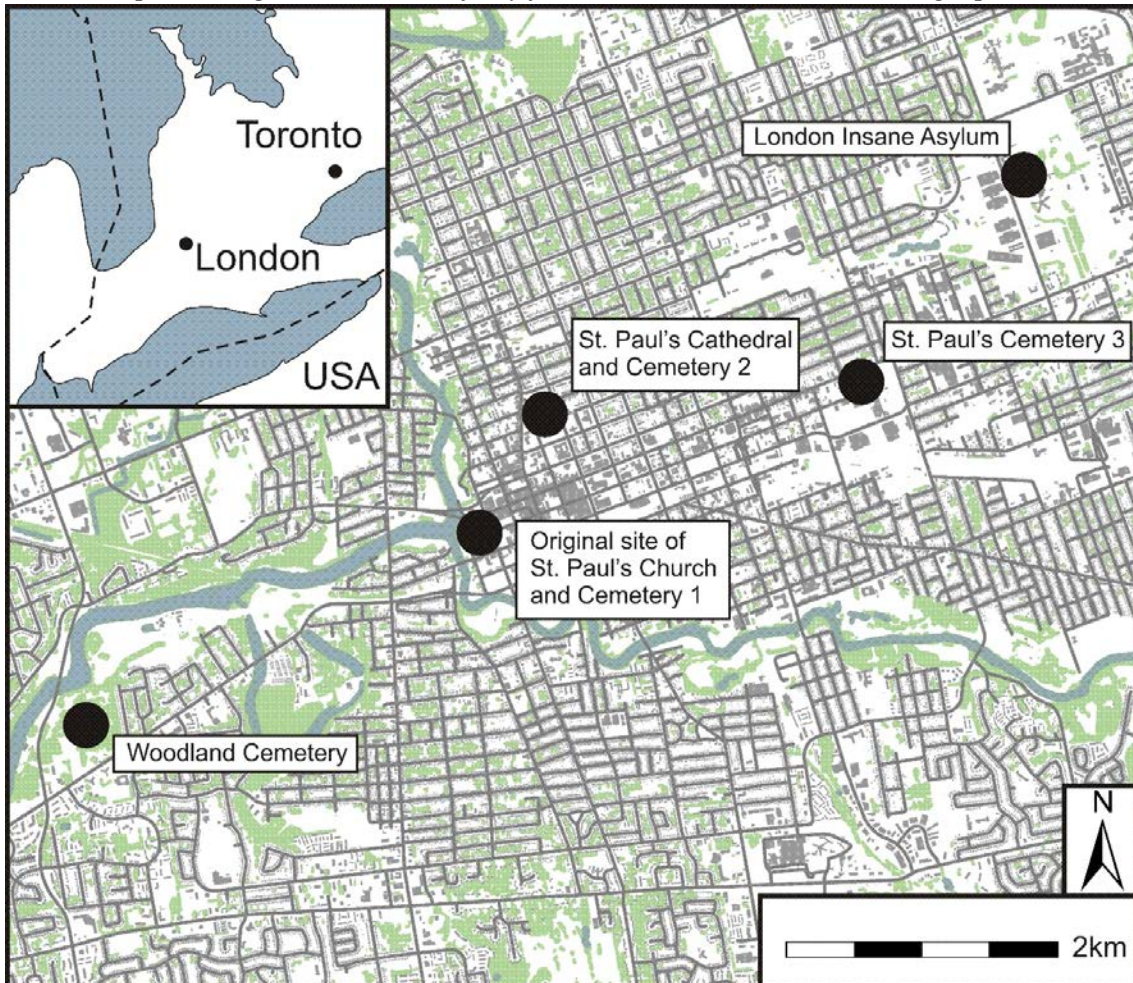
Woodland's potter's field is a long and narrow tract of land located on the easternmost edge of the cemetery (Figure 2). This area is not within the consecrated area of the cemetery (Woodland Cemetery, pers. comm.). It is marked by the general absence of headstones and a row of large coniferous trees which border the eastern side. The ground is grassy and uneven, likely as a result of tree roots, soil subsistence, and the presence of the grave cuts (see cover page).

Figure 2

The location of the potter's field in Woodland Cemetery.
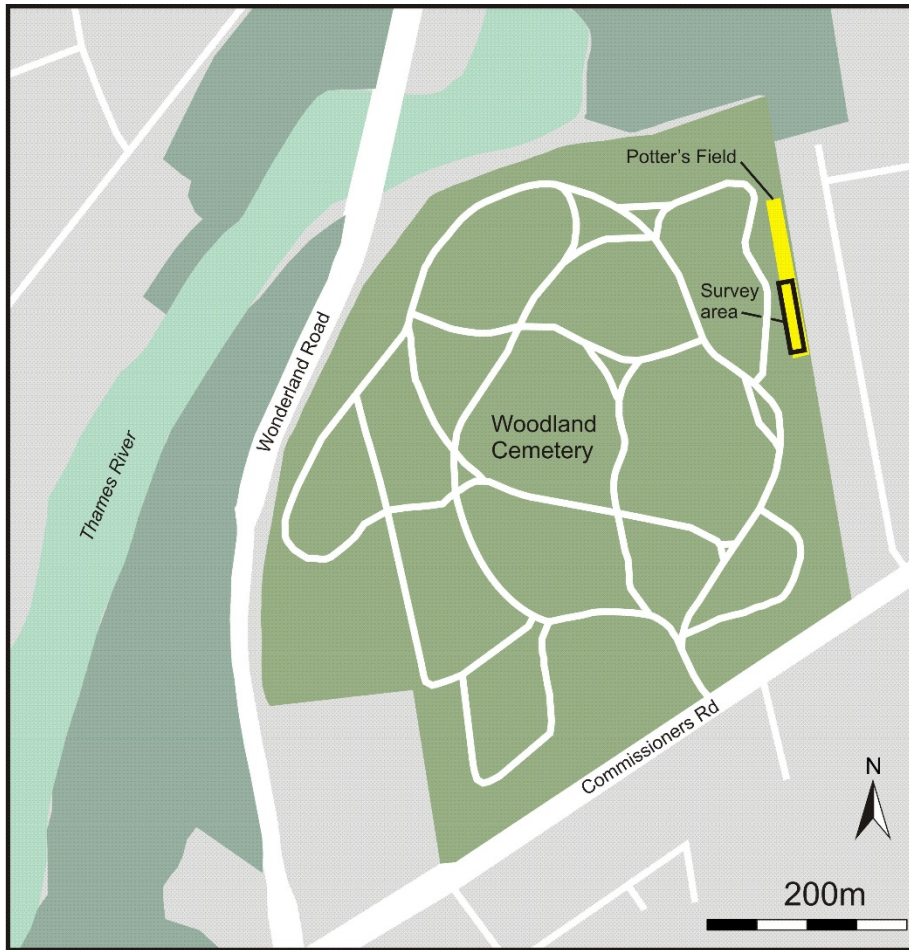
Note. Figure prepared by Ed Eastaugh. After maps.google.com

1.1. Theoretical approach

The students involved in this project have backgrounds in various subdisciplines of archaeology and physical anthropology. Mortuary archaeology, or funerary archaeology, is the study of the numerous ways that societies deal with death and how these mortuary contexts have varied through time and space (Martin et al., 2013b). Throughout the Mortuary Archaeology

course and during this project, we have engaged with a range of approaches in archaeological theory that have been useful to interpret mortuary practices in the past.

Broadly speaking, there are two central paradigms that have been at the forefront of archaeological theory during the past 50 years - processual/new archaeology and post-processual archaeology. Processual archaeology arose in the 1970s and emphasizes the importance of empirically grounded interpretations resulting from hypothesis-driven, scientific methodology (Binford, 1970; Saxe, 1970). On the other hand, post-processual archaeology arose during the 1980s as a critique of the processual approach, offering alternative interpretive perspectives (Hodder, 1985). This approach often uses a phenomenological interpretation of the archaeological context, which is concerned with the phenomena associated with an individual's lived experience, in this case an individual long dead (Brück, 2005).

The contributors in this report offer a blend of both processual and post-processual paradigms in their analyses. A general history of Woodland Cemetery and a timeline of the burial transfers from St. Paul's Cemetery are provided by Casey Boettinger in Section 2. Teegan Muggridge provides an overview of North American burial practices, including examples of other potter's fields in North America in Section 4. In Section 7, David Seston provides technical information and summarizes the results of hands-on phase of data collection and Isabella Veseley covers the mapping of the potter's field using the remote sensing and archival data that was collected. Ed Eastaugh also made important contributions to this section. In Section 6, Émy Roberge summarizes the stages of decomposition and the preservation of human remains while Hope Atkinson assesses the taphonomic processes of the potter's field and ties the research into the broader mortuary context.

While the individuals above employ a processual approach, several contributors engage with a post-processual interpretation of various contextual components, especially the marginalization of particular social groups. Nicole Phillips discusses the secularization of potter's fields and the changes in institutional control over the burial of the poor throughout history in Section 3. In Section 5.1, Lauren Poeta explores the concept of social death, providing insight into the different identities of the individuals in the potter's field and the various types of marginalization they experienced. Casey Boettinger analyzes the role of women, asylum patients, and other marginalized individuals in the potter's field, including background on the London Asylum in Sections 5.2-5.4. Cameron Beason summarizes the presence of subadults in the potter's field and discusses the underrepresentation of children in the archaeological record in Sections 5.5 and 5.6.

1.2. Methodology

Overall, this project is composed of two main components: (1) archival and historical research into the conditions and formation of this specific mortuary context and (2) hands-on remote sensing fieldwork at Woodland Cemetery's potter's field. All students participated in the collection of archival and historical data, and in the field work. The remote sensing operation was overseen by Ed Eastaugh who undertook the subsequent processing of the data which are presented in Section 7, *Physical Analysis of the Potter's Field*. Two techniques were employed for the collection of remote sensing data: ground-penetrating radar (GPR) and magnetic susceptibility (MS).

The historical and archival research included searching through numerous archival and historical resources from Western University's Archives and Special Collections at the Weldon Library, the Huron Anglican Diocese archives, the London Room of the London Public Library

and from Woodland Cemetery. These resources included microfilms of historical maps, burial records, transfer documents, and images from St. Paul's Cathedral Cemetery, St. Paul's Cemetery at Western Fair (a cemetery in London from which thousands of burials were transferred to Woodland Cemetery in the 1880s) and from Woodland Cemetery itself. Additional reports and archival materials were generously made available to this project by Timmins Martel Heritage Company (TMHC) and Kyle Gonyou, the Heritage Planner in the City Planning – Urban Regeneration Division of the City of London. The results of this review include: (1) a historical overview of Woodland Cemetery and its predecessors, and the individuals buried in the potter's field; (2) an anthropological analysis of the broader social context and how potter's fields fit into that context (with respect to both London, Ontario and North America in general); and (3) a physical analysis of the site, synthesizing the remote sensing results with information on taphonomy and decomposition.

Ultimately, the goal of this project was to apply archaeological theory and methodology to study a historic cemetery, working with community partners to enhance our understanding of this particular potter's field, and the broader mortuary and social context of this time period.

2. Historical and Literary Review

2.1. History of Woodland Cemetery

The first Anglican minister sent to serve London was Reverend Edward J. Boswell. He established the first St. Paul's Church and Cemetery on a 2.5-acre property at the Forks of the Thames on the site of what is now Museum London (see Figure 1). This property was granted to the Church of England by the Crown in or before 1831 (Heller, 1987). The church was a timber frame building and tower that was never finished. The land adjacent to the church was used as

cemetery from 1831 to 1834 (Woodland Cemetery, n.d.(b)), even though it was not consecrated (Heller, 1987). Interments at this cemetery included victims of the 1832 cholera epidemic (TMHC, 2019a).

In 1832, Reverend Benjamin Cronyn arranged with the Crown to exchange the site at the Forks of the Thames for land at the present site of St. Paul's Cathedral at the corner of Richmond St. and Queen's Avenue (see Figure 1). The original church was moved to the new location in the winter of 1832 and burials began on the new site in 1833 (Woodland Cemetery, n.d.(a,b)). Individuals in marked graves at the first St. Paul's site were moved to the new one (Heller, 1987). However, some burials were left behind and were encountered during building construction in 1925, and again during excavations at the London Regional Art and History Museum (now Museum London) in 1991 (Lawson, 1991; Wilson & Horne, 1996).

The St. Paul's Church burned down in 1844, and construction soon began on a larger English Gothic Revival style building on that site (City of London, 2015). The new church was opened for worship in 1846 (it is now the oldest church in London), and St. Paul's was designated as a cathedral in 1857 when the Diocese of Huron was established (City of London, 2015). In the meantime, by 1845, the second St. Paul's Cemetery was approaching capacity and the decision was made to seek new land. In 1846 Reverend Cronyn bought 16 acres of land east of London (grounds of the modern Western Fair) (see Figure 1) to serve as a new cemetery, the third St. Paul's Cemetery (a.k.a. St. Paul's Grove (Woodland Cemetery, n.d.(b))). In 1849, the Village of London ruled that the dead could no longer be buried within the village boundaries, cementing the need for the new location, which opened in 1852. At that time burials ceased at the St. Paul's Church cemetery (Heller, 1987; Woodland Cemetery n.d.(a)), and the existing burials were moved to the

new cemetery, although several individuals are known to have been left behind (Heller, 1987)[1].

However, after 28 years, interments at the third St. Paul's cemetery site also had to stop, following the 1880 action by the Village of London East to prohibit the burial of the dead within its boundaries (Government of Ontario, 1880). Thus, St. Paul's Cemetery had to be moved a third time (Brash et al., 2019; Heller, 1987).

In mid-August of 1879, the diocese found a new 56-acre site and named it Woodland Cemetery (after part of the property that was called Woodland Park) (see Figure 1). The first burial at the new location took place in December of 1879 (Woodland Cemetery, n.d.(b)) and the move of burials from St. Paul's Cemetery to the new location began in 1880, ultimately taking 6 years (Woodland Cemetery, n.d.(a)). Estimates for the total number of burials moved ranges from 4,500 (Brash et al., 2019) to 8,000 (Heller, 1987). One thousand, three hundred and seven burials were moved from the St. Paul's potter's field (Fillmore & Sayers, 2020), at the expense of the rector and churchwardens of St. Paul's (Government of Ontario, 1880)[2], although "not much care was paid to" these burials through the removal process (Brash et al., 2019: 52). Burials destined for the Woodland potter's field were among the first to be moved. The asylum burials were moved in January and February and the potter's field burials in February and March of 1880 (Fillmore & Sayers, 2020). Many individuals buried in the main St. Paul's Cemetery whose family members could not be found, were also buried in the potter's field at the Woodland cemetery site (Brash et al., 2019).

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[1] There are 16 grave markers lying flat in the north lawn of St. Paul's Cathedral, in the area where the 2nd St. Paul's Cemetery was located (TMHC, 2019a). One marker dates to 1832, and so was likely moved from the first St. Paul's Cemetery.

[2] Note that the potter's field is referred to as the "free ground" in the 1880 document (Government of Ontario, 1880).

St. Paul's Cemetery was one of two large cemeteries at the site of what is now the Western Fair (see Figure 3). The second was the Wesleyan-Methodist Cemetery, in use from 1854 to 1879, after which it was moved to Mount Pleasant Cemetery on Riverside Drive (Heller, 1987). However, in 2003, human bones were encountered when construction started for the Western Fair Agriplex, which was being built on the site of the Wesleyan Cemetery, initiating a Stage 4 Archaeological Assessment (Archaeologix, 2007). Stage 4 assessments lead to the development of strategies to conserve sites of cultural heritage interest and may lead to the documentation and removal of an entire site through excavation (OMHSTCI, 2020), as was the case here.

Figure 3

Map of the City of London and Suburbs, 1878, showing St. Paul's Church (ellipse), St. Paul's Cemetery (the third) (circle) and the Wesleyan (square) Cemeteries (after Rogers, 1878).
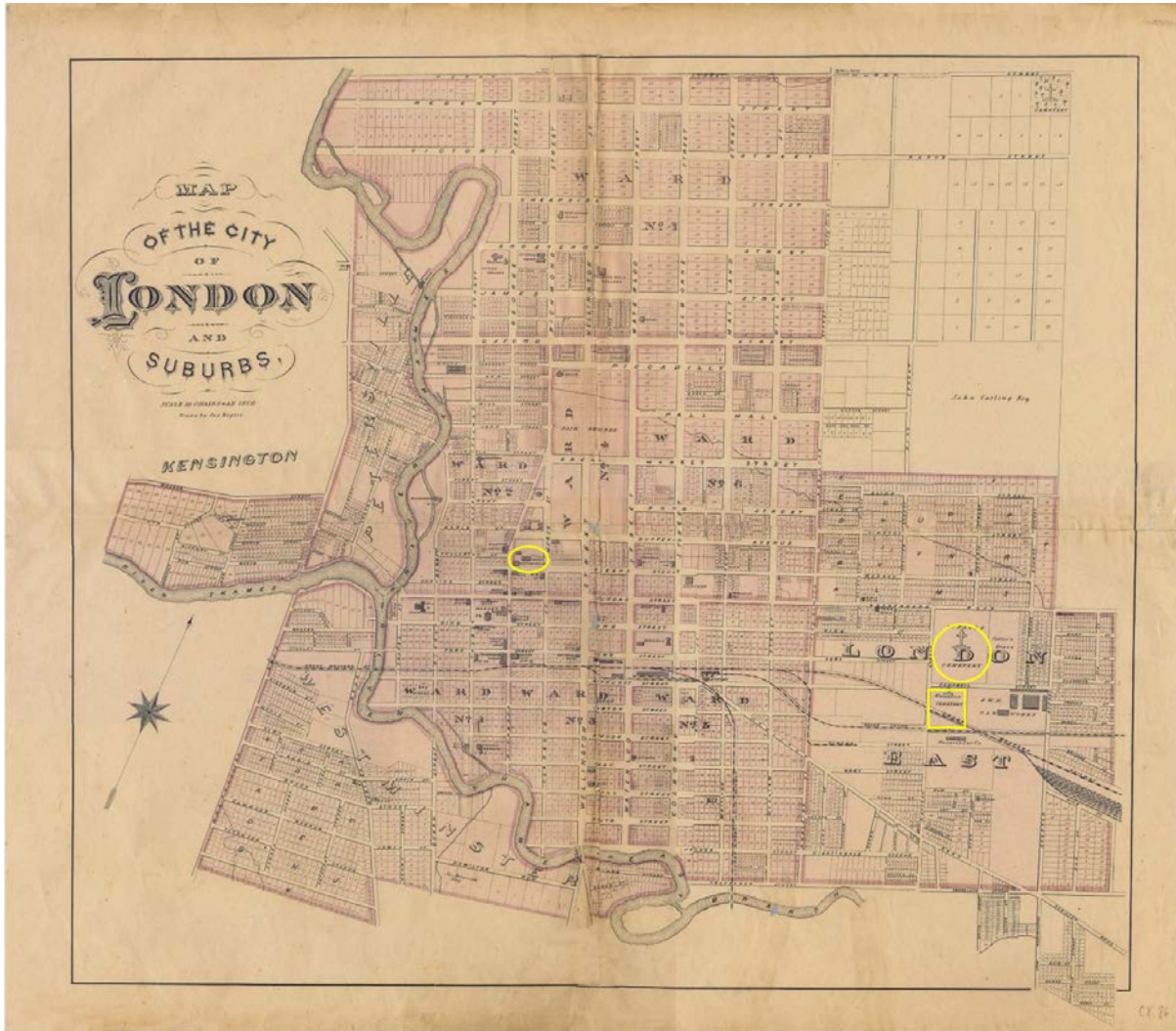
Excavations at the Western Fair site between October 2003 and February 2004 led to the discovery of 555 grave shafts, 26 of which were intact. The intact shafts contained the remains of 28 individuals. One hundred and thirty of the grave shafts were only partially complete. The incomplete shafts contained an additional 140 individuals (Archeologix, 2017). These are individuals who were left behind in the 1880s when the Wesleyan-Methodist Cemetery was moved to Mt. Pleasant. Fifty-eight percent of those left behind were subadults. Archaeologix (2017)

speculated that the reason for this bias may be that the graves were small and easy to miss. Subsequent Stage 1 and Stage 2 Assessments of Western Fair property (documentary and low intensity inspection of the site) undertaken by Timmins Martelle Heritage Consultants (TMHC) (TMHC, 2018; 2019b) suggest that it is highly likely that many burials were also left behind from the St. Paul's Cemetery. TMHC (2018) suggest that burials encountered near York Street in 1911 were individuals from St. Paul's potter's field based on the location of the free ground presented in the Government of Ontario gazette ("situate [sic] on the south side of a line one hundred and forty-eight feet north of and parallel to the northerly limit of York street" 1880: 317) (see Figure 4). Thus, it is almost certain that the entire contents of St. Paul's Cemetery, including all its potter's field burials, did not make the transition to the new site.

See Figure 4 for the location of the St. Paul's potter's field according to the description presented above. Note that it is spatially separate from the main part of St. Paul's Cemetery as indicated on the City Map.

Figure 5 shows the change in land classification of the London East site, 4 years after the closure of St. Paul's Cemetery. By 1884, the Wesleyan Cemetery had disappeared from the map, its move apparently complete by then. However, the St. Paul's Cemetery move was still in progress, as it still appears on the map.

Figure 4

A detailed plan of the St. Paul's Cemetery in 1878, with the potter's field indicated as described in Government of Ontario (1880).
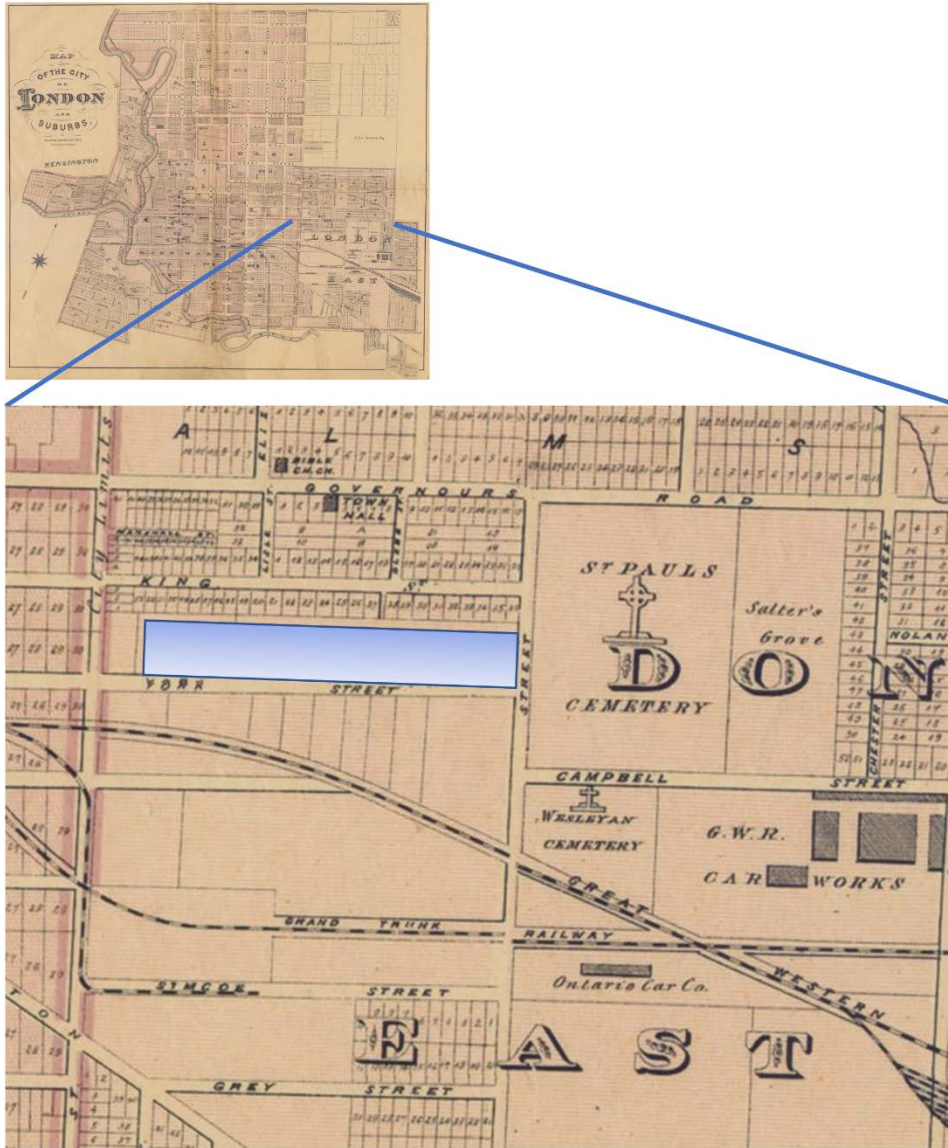
Note. There is visible spatial separation between the *free ground* and the main cemetery. Dimensions of the potter's field are approximate; they are intended merely to indicate its location (after Rogers 1878)

Figure 5

Map of the City of London and Suburbs of London East, London West and London South, 1884.

Note. The image indicates that the move of St. Paul's Cemetery was still in progress, but the Wesleyan Methodist Cemetery's move had been completed (after Graydon (1884)).

Over the years, Woodland has expanded to include different dedicated sections within its cemetery. The Veteran's section was created in 1939; it is a quiet and wooded slope of the

cemetery. London's first crematorium was built in Woodland and started its operation in 1964. It was designed to resemble and old English stone chapel (Woodland Cemetery, n.d.(a)). Due to a rise in cremations, the old stone chapel was transformed into a columbarium called 'Woodland Sanctuary' (Woodland Cemetery, n.d.(a)). London's first outdoor columbarium was in use by 1980. It has six sides and holds 144 niches total. Cremating the remains of people has allowed for a larger population of people to be accommodated at Woodland. The columbaria hold the cremated remains in urns and allow a higher volume of remains in a smaller space. By 2000, there were five columbaria in place at Woodland (Woodland Cemetery, n.d.(a)). See Figure 6 for a 1993 survey of the Woodland Cemetery. The potter's field is a narrow strip running north-south along the eastern edge of the cemetery.

The land on which Woodland Cemetery sits was annexed by the City of London in 1961 (City of London, 2020).

Figure 6

Survey of Woodland Cemetery dated 1993.
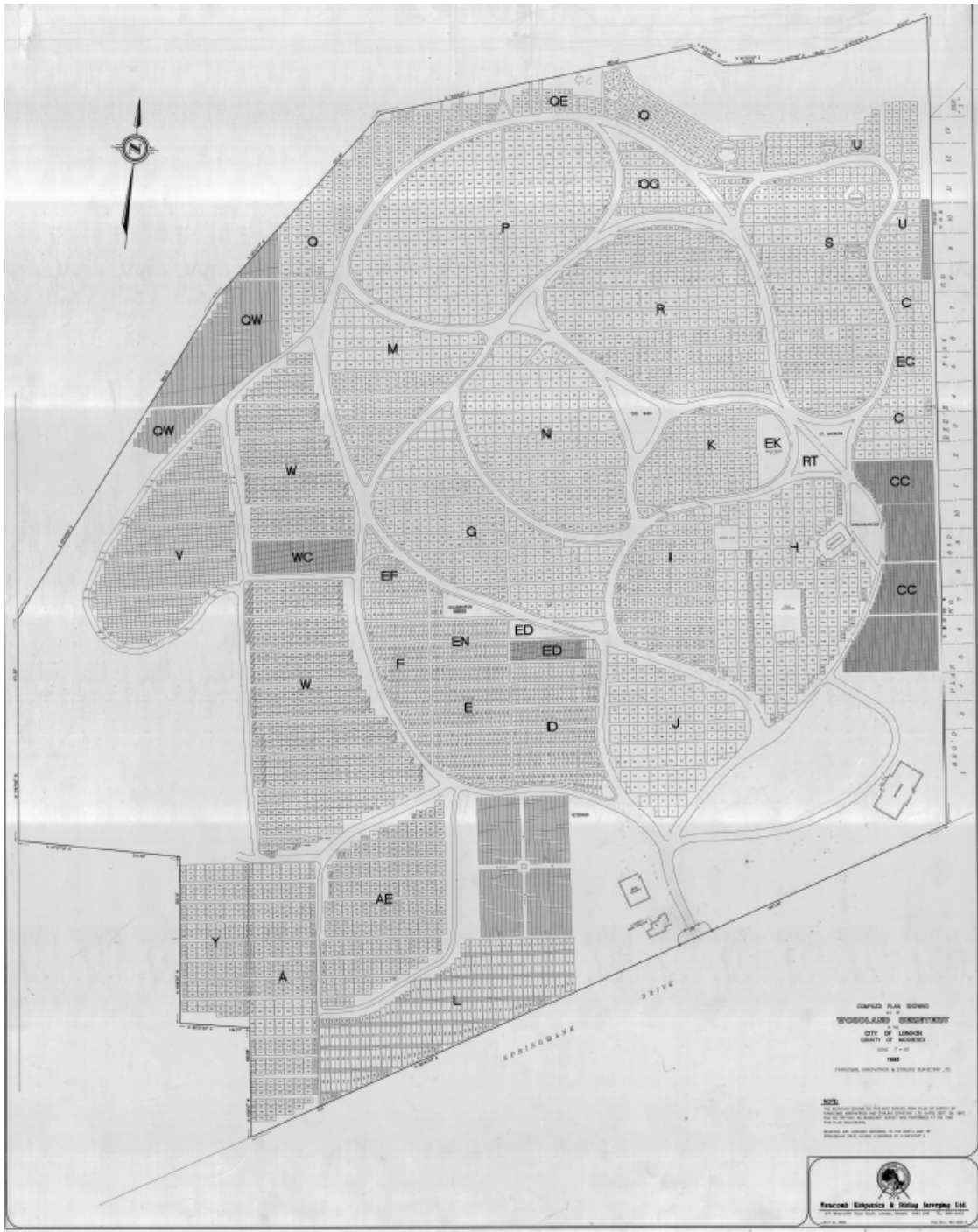
Note. The potter's field is the narrow strip along the east (right) side of the map (Farncomb et al., 1993).

3. Historical Analysis of Mortuary Practices in London, Ontario

3.1. Secularization of the potter's field

Secularization is the process of shifting from religious to non-religious contexts and has been a common process in many European and North American burial practices over the past century (De Spiegeleer, 2017). The use of potter's fields in particular, has undergone significant changes as a result of the secularization process, with some aspects transformed and others removed all together.

The origins of the practice of burying people in a potter's field lie in the Biblical passages of Matthew 27:3-8. In these passages, Judas Iscariot is remorseful for betraying Jesus to the Romans in exchange for thirty pieces of silver. Judas tries to repent his act by offering the silver to the priests at the Temple of Jerusalem. However, the priests refuse the offering because it is blood money. Left with the silver, the priests prohibit its use in the poor box, instead using the money to purchase land for the burial of the poor. The area was a section outside of the city where local potters went to mine clay, hence, the origin of the potter's field's name. This unworkable land became the burial grounds of strangers, foreigners, the poor, and outcasts. See Menken (2002) for an extensive analysis of the development of this interpretation from the original Hebrew biblical text.

The practice of burying the poor in potter's fields continued throughout the history of Christianity. The initiation and continuation of this practice likely stems from Christianity's emphasis on the importance of the soul (Gross & Ridenour, 2017). Should the deceased not receive a Christian burial, the individual has no chance of heavenly ascension upon the Last Judgement as they have no body to resurrect. Combined with this notion of final judgment is the adherence to

virtues (Gross & Ridenour, 2017). In the context of burying the poor, charity is the most important virtue because it encourages Christians to care for fellow humans, societies' poor and outcasts included. The combination of the soul's importance and Christian virtues leads to a continued care of the poor in death. However, beyond the simplest requirements of burial and grave positioning on east-west alignment (head to the west), nothing else is required to fulfill this religious obligation. Therefore, the social treatment of the poor is similar to their experience in life; they receive minimal support and are socially isolated from the rest of the population (see Section 5). This separation is seen physically in burial grounds where the poor are buried anonymously, in distant areas.

Central to this burial form is the traditional Church's ability to control who receives a potter's field burial and who does not. This ability to control people's death practices, in conjunction with their lives, allows the Church to use the dead to display its religious authority. This form of control over people's lives and deaths is referred to as biopower and is seen in religious, and later secular, mortuary contexts (Lazzarato, 2002). The potter's field then becomes a way for the Church to use the dead to discourage people from straying from doctrine or falling into an unacceptable social position/class, through the threat of mortuary ostracism (De Spiegeleer, 2017).

However, during the 19th and 20th centuries, the Christian monopoly and authority over death and care for the poor started to diminish (De Spiegeleer & Tyssens, 2017). The divisions in intra-Church theology, combined with new philosophies (science and liberalism), produced a retraction of religious involvement and an increase in the secular government's participation in the care of the poor.

Intra-Church conflicts in this period produced a great diversity of Christian denominations in a short period of time (De Spiegeleer, 2017). The consistency of Christian scriptural interpretations within a region, traditionally in the form of the Roman Catholic Church for most of Europe, became increasingly inconsistent, which likely led many individuals to question their spiritual affiliations. Coupled with this inconsistency was the increasing challenges Christian dogma was faced with due to scientific advancements. Fundamental teachings of scripture were being contradicted by tested scientific research, such as the origin of species. Additionally, scientific advancements in medical treatments made previously fatal conditions survivable. The result was a shift in the authority of life and death away from religion and towards medicine and science (Gijbels, 2018). These factors led to a challenge of Christianity's authority over the natural world.

The emerging movement of liberalism in this period also caused large retractions of Churches' powers in the governing of the state (De Spiegeleer & Tyssens, 2017). Liberalism is characterized by several features but key to mortuary contexts are its emphasis on individual rights, legal equality, and freedom of religion. For the poor, this new wave of thought produced legal changes which gradually conferred them greater autonomy in life. However, the promise of liberal individualism did not permeate through to death because many of the poor were still buried in potter's fields due to economic conditions beyond their control.

The combination of Christian duty and new philosophies has brought potter's fields to their modern, secular form. Though the involvement of religion is limited in modern North American potter's field burials, the Christian concept and form of the potter's burial and field are still used today. The potter's field on Hart Island, New York, used continuously since 1869 (Dajao, 1999), has been in use recently for the burial of unclaimed Covid-19 pandemic victims (Rosen, 2020).

Individuals in modern potter's field burials are based solely on economic status (or in the case of Hart Island, pragmatics); moral or social positions no longer determine the individual's burial in a potter's field. One primary change is that the burial is paid for by the municipality or the state, which provides a basic form of burial. In parts of Canada and some U.S. states, the poor are cremated, with the ashes spread in a designated area or buried in a communal area if the remains are unclaimed (Davis, 2015; Young & Russell, 2017). In each case, the governing body can dictate the terms of the deposition. Importantly, these burial forms are no longer directly dictated by religious doctrine because the forms have become normalized burial practices. Additionally, the poor are still denied their individuality through these anonymous burials, which is the same situation as the Church's potter's burials. Therefore, although many of the specific religious practices have changed, secular care of the poor still maintains strong Christian associations.

Within this context, it is worth noting that there was an active discussion among Church Wardens in 1879 whether the new cemetery in Woodland Park should be named St. Paul's (the 4th) or given a new name. The more secular "Woodland Cemetery" title won out in the end (Brash et al., 2019).

4. Historical Analysis of Other North American Potter's Fields

4.1. A brief history of 19th-century North American burial trends

At the beginning of the 19th century, most burials were those of the early pioneers. During this time, burials were often done on the home property, as family farms were often far from the church (Smart, 2011). An example of this kind of burial site is the Stiles family cemetery, in the modern subdivision of Stirrup Court, off Sarnia Road in London, ON. This site was used between 1840 and 1890 and would have been on the outskirts of London (Cook et al., 1985, Woodley 1992).

These burials were simple affairs with the family being responsible for preparations and the individual often interred in a homemade coffin. This was considered a time of grieving for the family who were to focus on the funeral while neighboring families were expected to help the grieving (Smart, 2011). As cities grew, so did churches, and in time, church cemeteries became the dominant places of burial. However, funeral preparations were still the responsibility of the individual's family and wakes were held at the house before the individual was transferred to the church cemetery (Smart, 2011). With the church as the central place for burials, religion was the primary driver of funerary practices.

As the 19th century went on, funeral practices became more elaborate and the cost of a funeral increased. By the mid- to late 19th century, the commodification of the funeral industry and the growing disparity between the wealthy and the poor was visible. There were increased standards for burials and a notion of what was required for a "decent" funeral (Smart, 2011). These standards outlined specific criteria for the "proper" casket – which was much more complex than previous casket styles and involved the inclusion of additional decorative aspects, such as interior trimmings – and a particular dress code for both the deceased (Smart, 2011) and mourners (Oshawa Community Museum, n.d.).

During this time, a shift also occurred in who was responsible for different aspects of the funeral, and the role of the undertaker began to appear and evolve. In the mid-19th century, many cabinet makers began to take on the role of undertakers, providing products and services for the funeral, such as coffins (Beal, 2018)[3]. Following the American Civil War, embalming also became an increasingly common and accepted practice for those who could afford it (Trompette &

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[3] For a discussion of this in the London, ON, context see Brash et al. 2019:63-64.

Lemonnier, 2009). By the late 1800s, the position of undertaker became a full-time job, as they were responsible for most of the funeral duties, including planning the service and providing someone to watch over the body during the wake (Smart, 2011).

Additional developments in 19th century burial practices come from the increased secularization of funerary practices, an increase in disease epidemics, and changes to the law. The second half of the 19th century saw an increase in the presence of public, non-denominational cemeteries that were owned and operated by the cities and townships (Smart, 2011). These cemeteries were sometimes used as potter's fields (a good example of this is the Toronto Potter's Field – see below). Additionally, sanitation became a growing problem in cities, as epidemics became more common. The main epidemics faced by Canada were the cholera epidemics in 1832 and 1834, the typhus epidemic in 1847, and the smallpox epidemic in 1885 (Cadotte & James-abra, 2013). The combination of overcrowding and sanitation concerns caused several cemeteries to be closed and relocated outside of city limits (Simpson, 2011) (as was the case with St. Paul's Cemetery discussed above). Additionally, embalming was promoted as a "sanitized" process and was, therefore, highly encouraged (Trompette & Lemonnier, 2009). Increases in individuals with disabilities as a result of war and industrial accidents also led to the introduction of what were termed "ugly laws" in the later 19th century (Swiech, 2015). These laws allowed for the legal segregation of the disabled and others who may have been considered "undesirable", such as those seen to be unstable (Sweich, 2015), into insane asylums, poor houses, orphanages, and prisons (Byrnes, 2015). This segregation in life often carried over into death, as the use of potter's fields increased.

By the beginning of the 20th century, cities increased in size and houses tended to be smaller. This meant less room for in-house funerals and the further commodification of the death

industry. Undertakers began offering funeral space within their establishments, moving the place of the wake from the family's front parlour to the funeral parlours of funeral homes (National Museum of Funeral History, n.d.). Around this time, there was also an increase in population mobility, leading to an increased number of migrants and strangers living in cities, separate from their families (Byrnes, 2015).

Altogether, the conditions and expectations surrounding burial practices in the 19th and early 20th centuries created a larger disparity between the wealthy and the poor in terms of burial treatment. Additionally, perceptions of the time allowed for the segregation and ostracization of many underprivileged groups – the disabled, the diseased, the mentally unwell, the criminal, and the unknown – both in life and death, making them likely candidates for burial in potter's fields.

4.2. Known Examples of Potter's Fields

Other examples of potter's fields in North America provide a general understanding of this burial practice. However, it is important to note that these are case studies of individual potter's fields and may not be representative of all potter's fields. This section will examine the potter's field in Toronto, Ontario; the Cincinnati Music Hall potter's field in Cincinnati, Ohio; the potter's field in Santa Clara County, California; the Greenwood Cemetery potter's field in Owen Sound, Ontario; Holt Cemetery in New Orleans, Louisiana; and Hart Island in New York, to illustrate the variety in potter's fields in North America.

The Toronto Potter's Field was in use from 1825 to 1855. This cemetery was the first cemetery in Toronto that was public and non-denominational. The first to be buried at the site was an infant; infants made up 40% of those buried at the cemetery by the time it closed (Smart, 2011). Many of the other individuals who were buried here were victims of different epidemics in Toronto

– namely typhoid, cholera, and diphtheria (Mayers, 2007). By the time that the cemetery closed, 6,700 individuals had been buried there (Mayers, 2007).

The Cincinnati Music Hall Potter's Field, also referred to as the Public Burial Ground, was accidentally re-discovered and excavated in 1988. It had not been recorded on maps since 1838, when the Cincinnati Orphan Asylum was built on the land (Grauer et al., 1995). While in use as a burial ground, the site was used to inter individuals of lower status, the indigent, and migrants into the community. Analysis of the remains indicated that the sample was roughly 66% male, with a mean age of 40-45 years. Approximately 40-60% of the individuals were also determined to be of African American ancestry, a disproportionally high percentage in comparison to the population profile of Cincinnati at the time (Grauer et al., 1995). Grauer et al. (1995) suggest that this could have been the result of the marginalization, with African American individuals being more likely to be buried in a public burial ground rather than in church yards, or that the burial grounds had themselves been segregated and construction happened to disturb an area reserved for African American, suggesting that excavations in other areas would encounter other ethnic samples.

The potter's field in Santa Clara County, California, is another potter's field that was accidentally lost to time. This burial ground was used from approximately 1875 to 1935 and ceased to be recorded on maps after 1958 (County of Santa Clara, 2013). It is thought to have been used a burial ground for patients from the hospital who could not afford a burial or who did not have family to bury them (Griffin et al., 2012). As of the summer of 2013, the remains of 631 individuals, with some simple redwood coffins (in some cases containing handles and other hardware) had been discovered at the site (Santa Clara County, 2013). The redwood coffins and the presence of handles and hardware make for more elaborate coffins than are generally seen in most potter's fields, although this anomaly is not noted in the report. While no known records of

these burials exist, osteologists have performed some analyses of the remains. The majority of the individuals were estimated to have been those of men between 23 to 60 years of age. Females composed a smaller portion of these remains and the remains of infants and adolescents even less so (County of Santa Clara, 2013). Additionally, evidence of amputation was identified on many of the remains. Unspecified laboratory tests were also done on the best-preserved remains. These tests revealed that syphilis and other infections were the likely cause of death for several of the individuals and others may have died as a result of diabetic complications (County of Santa Clara, 2013).

The potter's field at Greenwood Cemetery in Owen Sound was in use for 100+ years since 1860. There are no grave markers in this potter's field, although the city does have some general records about who was buried there (City of Owen Sound, n.d.). Approximately 1,242 people were interred in this field, including stillborn babies, newborns and toddlers in addition to orphans, seniors, the working-class poor, and the homeless as well as hundreds of individuals from the black community (City of Owen Sound, n.d.).

Originally intended to be a cemetery for the indigent dead of New Orleans, Holt Cemetery holds unknown veterans, jazz musicians, and those who died as a result of epidemics and inner-city violence. Most of these individuals are of African American ancestry. In contrast with other cemeteries in New Orleans, Holt Cemetery holds exclusively below-ground graves. These graves are shallow and lack order. Many of the graves do not have headstones, and throughout the cemetery's 150+ (and still active) years of use, several of the grave plots have been reused (Krummel, 2013). This has led to a scattering of fragmentary remains on the surface of the graveyard. Unlike other potter's fields, Holt Cemetery contains much cultural and dedicatory material, including offerings placed at many of the graves, as well as some homemade gravestones

(Krummel, 2013). A renovation project with a budget of $450,000 was announced for Holt
Cemetery in 2013 (Rainey, 2013).

Figure 7

The Baby Trench at Hart Island.

Note. Photo © Joel Sternfeld, courtesy of the Hart Island Project.

Hart Island is an immense potter's field in the Bronx area of New York City which has
been in use since 1869 as a place of burial for the poor, unidentified and unclaimed. As of 1969,
more than 700,000 individuals had been buried there, two thirds of whom are children (Dajao,
1999). Mass burials began in 1875, when a numbered grid system was implemented to keep track
of individual burials (Hart Island Project, 2020). Access to the island was restricted until 2015,
after which relatives seeking to visit the burial site of loved ones were allowed on site. Hart Island
contains the remains of individuals from the 1918 Flu Pandemic (Hunt, pers. comm.) and is now
receiving burials from COVID-19 victims (Rosen, 2020). See Figures 7 and 8 for photographs of
burials from Hart Island. Interested readers are encouraged to visit the Hart Island Project web
site at https://www.hartisland.net/.

Figure 8

Adult mass burial, February 1992.

Note. Photo © Joel Sternfeld, courtesy of the Hart Island Project.

While these examples of potter's fields demonstrate that they share a common theme – a burial place for ostracized individuals – there is a considerable amount of variation among potter's fields. The composition of these sites varies from mostly adult males to a high proportion of infant and children remains. Additionally, the record keeping, visitation, and longevity of these sites varies from region to region, illustrating the diversity in site treatment and care. With respect to Woodland's potter's field, burial records are limited, especially regarding individuals' burial location and the transfer of burials and records between sites. The records that exist from St. Paul's Cathedral (1977) and Cemetery (1988) (which indicate individuals who are likely to have been

moved to Woodland) show a number of infant and young child burials, as well as the burials of both adult men and women in the second and third St. Paul's potter's fields. The recorded professions of many of the individuals (or in cases of women and children, the profession of their spouse/father) suggest that they were of lower socio-economic status, a common factor among most potter's fields. Additionally, the specific mentions of disease, race, and unbaptised status suggest that many of those who did not meet society's standards to receive a proper burial were interred here.

5. Social History and Context

5.1. Identity and Social Death

Identity is a social construct that is built around a variety of qualities that determine an individual's position in their social environment. Identity is not only indicative of how an individual fits in a structured society, but also how the individual relates to others in that society (Stets & Burke, 2000). Identity is based on both one's biological and symbolic notions of persona and fluidly reacts to the changing environments that an individual may encounter (Stets & Burke, 2000; Králová, 2015). Individual agency and existing social structures contribute to the evolution of each person's identity (Králová, 2015). Aspects of one's identity are reflected through both social and biological representations and can be favoured or disadvantaged by one's social surroundings. This creates the basis for ingroup and outgroup dynamics, developing a social hierarchy. Oppression can be felt by an individual or a group when one's identity is ranked socially lower than that of others. The resulting social inequalities shape the lived experience of individuals as well as the future biology of the marginalized groups. For a discussion of identity from the bioarchaeological perspective, see Martin et al. (2013a).

Social death is the result of extreme alienation or marginalization of a person from society. This may occur before or after a person's physical death, but these deaths rarely happen at the same time. For example, when an individual dies, their social identity lives on through the cherished memories of loved ones, extending their social life past their physical death. Norwood (2009) considers social death to be the result of three losses: loss of individual identity, loss of the ability to participate socially, and loss of relationships. No matter how or when it occurs, social death will ultimately result in the loss of individual identity and personal agency.

Social death before physical death occurs based on the perceptions and actions of others that create and maintain an individual at a distance from their society, removing their personal agency, and devaluing them in social relationships. This may be a result of immutable characteristics or unfavourable actions that an individual or the group of people they are associated with made during life. This significantly impacts the individual's life continuing past the event of their social death and the treatment they will receive before and after physical death occurs. In extreme cases, this can result in the dehumanization of an individual or group of people in the eyes of the society to which they belong.

Social class is constructed based on a multitude of aspects of one's identity and can lead to a great deal of prejudice. Feagin (1972) was the first to study the general public's beliefs about the causes of poverty, developing a list of 11 causes that fall under three broad categories: individualistic explanations (individual choices and personality traits), structural explanations (societal traits such as class system), and fatalistic explanations (uncontrollable factors such as bad luck or disability). Feagin (1972) conducted this study in America, determining that the blame for poverty fell mostly on individualistic factors. In fact, the most common factor that Americans blamed for poverty was a perceived laziness of the individual experiencing poverty (Feagin, 1972).

The act of dehumanization and lack of care towards individuals becomes easier when their circumstances and experiences can be blamed solely on their own actions or inactions. Feather (1974) later conducted a similar study examining the preconceptions of poverty in Australia, which reached similar conclusions. However, while Australians still focused on individual blame, some were more aware of structural and fatalistic causes of poverty as well as individualistic factors. A snowball effect then emerges with blame and marginalization reinforcing each other (Gans, 1995). The result of these preconceived notions of individualistic causes is that the poor remain in a morally inferior position relative to people in higher-ranking social positions (Gans, 1995).

However, these studies considered poverty strictly in a financial sense. Technically, the term 'poor' can be related to a state of being that is less than desirable. Poverty can be assessed according to a lack of finances, family, religion, health, or anything needed to thrive in society and maintain respect for others (Gans, 1995). This idea will be further explored through how poverty in many aspects of one's life can result in social death and be expressed in graves in the potter's fields.

While the state of poverty results in the marginalization of the poor, potter's fields exist as a response to social forces. Funerary services typically finalize one's place in society through the expression and care of those who survive. The poor, of course, will be buried with fewer resources and less grandeur than those who have a higher social rank in life, especially when the responsibility to carry out funerary practices falls on others, who may, or may not, be related or acquainted with the deceased. The funeral may turn instead into the time to represent an individual's social worthlessness, earthly failure, and social anonymity.

Coming full circle to Norwood's (2009) concepts presented above, potter's fields will be discussed here following Norwood's (2009) three main categories of social death: (1) the loss of

identity, (2) the loss of ability to participate socially, and (3) the loss of relationships. Many of the following examples are multifactorial, meaning it is possible for them to be classified under more than one of the types of losses that result in social death. This exemplifies the complex relationships between social structures and identity.

There are many examples in which the loss of identity is explicitly expressed in potter's field graves (Norwood, 2009). First, individual grave goods are not included in burials, removing the possibility to express aspects of an individual's life through their burial possessions brought into the afterlife. Name plates and grave markers are excluded, suggesting the social worthlessness and apparent disregard for the memorialization of the deceased. Lack of respect for the body of the individual who once lived is also evident in the burial position, which sometimes indicates rough handling and possible dropping of the caskets into shallow graves (Simpson, 2011). The personal agency of the individual is not considered when their burial is placed in the hands of the community versus the family.

The loss of the ability to participate socially (Norwood, 2009) is also evident in the potter's field cemeteries. The deviants and marginalized of society (the poor, criminals, psychiatric patients, suicides, unbaptized, etc.) were buried in marginalized places of the graveyard, where paying customers refused to buy plots, thus grouping the marginalized individuals together into one collective identity. One way that social identity lives past the grave is the continued revisiting/worshipping of a gravesite of an individual and the giving of offerings to them by their friends and family members. However, the location and practice of not marking the grave further prevents survivors and descendants from focusing their mourning in a specific place associated with the body. Furthermore, this prevents the individual from continuing to participate socially

with the living members of the community, ensuring they remain socially dead. The meticulous records of the Hart Island potter's field are an exception to this pattern (Hart Island Project, 2020).

Loss of relationships (Norwood, 2009), is the third and final category discussed here. There is significant overlap between this type of loss and the loss of the ability to participate socially (above) when applying Norwood's schema to this type of grave context. Specifically speaking to this category, there are two obvious expressions in the potter's fields: 1) financially, when the family is unable to support an individual, resulting in them going to a workhouse; and 2) medically, resulting in them being segregated to a hospital or sanitarium, after which they lose the right to provide for them after death. As mentioned above, familial ties and mourning rituals are disrupted or fully prevented by removing direct access to the body from the surviving family and friends.

In conclusion, there are many examples of social and identity losses experienced by the people buried in potter's fields as assessed from their physical remains and records of their burials. Many of these examples are directly related to erasing the individual identity of the person in every way possible. However, these losses can be further interpreted to understand their positioning in their own social worlds and how others interacted (or not) with them during their lives. Potter's fields offer a unique glimpse into the identity of the poor and perceptions of poverty in the social environment in which they existed. However, by identifying the people who were buried in the potter's field, the burial area will function as a link between their original identity and the new collective identity they are now assigned, even though specific grave plots are impossible to identify.

5.2. Who is Buried in the Woodland Potter's Field?

Those who were 'morally loose', or unchristian, un-wed mothers, destitute women, those who were unbaptized, babies, criminals, 'the infirmed', those who had nowhere else to go, and those who were poor, essentially all those that society considered undesirable, were buried in the potter's field (Hord, 2018). Many of those who died while in the London Asylum or at the City Jail were buried in this field (Fillmore & Sayers, 2020). The potter's field also acted as a temporary grave for individuals who were waiting to be identified. Some of the burials are double-depth burials where multiple bodies were stacked vertically so that they took up less 'plot' space (Fillmore & Sayers, 2020) (see also Figures 7 and 8). In this section we will focus on the women and children in the Woodland potter's field.

5.2.1. Women in the Woodland Potter's Field – The London Asylum for the Insane

When it opened on November 18th, 1879, the London Asylum for the Insane took in transfer patients from the Orillia and Malden Asylums. By 1900, it was the largest insane asylum in Ontario, housing more than 1,000 patients (Krasnick, 1981). The London Asylum for the Insane was well-known for the amount of surgeries performed on its inmates. In 1899 alone, the medical superintendent of the London Insane Asylum, Dr. Bucke, reportedly had 206 women examined, of which he found 'organic disease' in 175. Organic disease is defined as a disease that occurs due to structural changes in organs or tissues (Organic disease, n.d.). Dr. Richard Maurice Bucke believed that he could help hysterical women, if not totally cure them, by performing hysterectomies on them.

Beginning with the Greeks, and lasting even until the 1900s, was a belief that 'hysteria' in women was caused by disorders of the uterus (Hollender & Nashville, 1972). Dr. Bucke performed

hysterectomies on 161 of these 175 women he had examined (Mitchinson, 1982). Dr. Bucke reported that of the 161 women he performed surgeries on, 62 recovered mentally, 43 improved mentally, 52 improved physically, and four died from the procedure. It is not known whether Dr. Bucke received written consent from each of these women's caretakers, or if he performed these surgeries unbeknownst to their families. Even then, he was criticized for performing too many of these operations (Mitchinson, 1982). It is perhaps ironic that Dr. Bucke was buried in Woodland Cemetery, not far from many of his patients (Abaza, 2018) (see Appendix 2).

People could be admitted to the Asylum for 'scandalous' behaviour. Anything that went against the norms of the day constituted a reason to be admitted. In many instances, individuals were effectively 'removed' from the family when they entered the asylum and were treated as if they were already dead. Though the inmate may not be physically dead, in many cases, they were considered dead socially (see Section 5.1, above). Their family would want nothing to do with them, and would behave as if they were already departed. If their family did not claim them upon physical death, they would be buried without a marker in the potter's field. About 400 Asylum patients were interred in the potter's field, in a combination of single-, double- and even triple- or quadruple-depth burials (Fillmore & Sayers, 2020).

In the early days of the asylum, if a person died, they would continue to just lie on the bed, decomposing, until their body could be moved to the cemetery (Mitchinson, 1982). This suggests a lack of care for the person upon their death. At the very least, allowing the deceased's body to continue decomposing in their bed certainly was not a sanitary solution.

Figure 9

A Record of Burials from the third St. Paul's Cemetery showing 2 individuals coming "from the asylum". St. Paul's Cemetery (1988).

According to St. Paul's Cemetery burial records (Figure 9), the Asylum paid $3 to inter a

patient in the potter's field at the third St. Paul's Cemetery. The interment records, housed in the

London Room of the London Public Library, state each individual's name, their profession as

"from the asylum", and the amount paid by the Asylum for the burial plot. The ages of the Asylum

patients are missing from the majority of burial records. Age is a detail that is noted for most other

burials in this potter's field. This, again, suggests a lack of care for the Asylum individuals. The

concept of a lack of care for the marginalized individual is directly related to Norwood's (2009)

observations of social death (see section 5.1 above). If a family member claimed the body after it

had been interred, the $3 would be crossed off from the records, though the name would remain. This means that there are more names recorded than actual burials.

5.2.2. Women in the Woodland Potter's Field – Specific Examples

Alicia Helena Wilson's body washed up on the Thames in July of 1925. Her body was discovered by two 13-year old boys who were playing alongside the river. Her body had been decomposing for about two weeks already by the time the teenagers found her (Cheater, 2018). Alicia was buried in the potter's field because she was not identified at the time. The potter's field was not her final resting place; it merely acted as a temporary resting place for her as her body was later identified. Unfortunately, the records and detail are scarce, but what is known is that her body was exhumed and moved to Ingersoll (Abaza, 2018; see Appendix 2).

One woman who found her final resting place in the Woodland Potter's Field is Emma Wilson. She died by poison in a brothel in 1867, at the age of 19. The poison was self-administered, making it a suicide. That fact alone would be enough to warrant burial in the Potter's Field, but she was also a known sex-worker (Abaza, 2018). Newspaper articles at the time wrote that she was an "abandoned female tired of life" (CBC News, 2018). These circulating newspaper articles also mentioned that she had a prominent father in Toronto. He did not claim her body, likely owing to the stigma surrounding suicide and sex-work.

These are just two of the many stories of women who were buried in the Woodland Potter's Field. Not every person had an extraordinary death; in fact, most of the burials in the potter's field were unremarkable. Many of these burials do not have a marker to identify who is buried beneath (see Norwood (2009) and section 5.1 for more discussion on the loss of identity, loss of ability to participate in society, and loss of relationships).

5.2.3. Women in Archaeology and Bioarchaeology

That the study of the past lives of women is a valid research topic is still a relatively new concept to the field of bioarchaeology. In the past, women have not been regarded with much fascination; males, after all, were the ones who were the hunters, and who carried on the family name and inheritance. Only recently have archaeologists pushed to better understand the lives of women in past societies. In order to fully understand the social structure of past societies, all facets and all people, ought to be studied.

A focus on the archaeology of gender and feminist archaeology has been facilitated by the development of post-processual archaeology referred to in Section 1.1. This particular movement emerged in the 1970s and 1980s as a reaction to the "Man the Hunter" paradigm that was then dominant in archaeology, epitomized by the "Man the Hunter" symposium and resultant book of that title (Lee & Devore, 1969). Pioneering women such as Spector (1991), Conkey (e.g. Conkey & Gero, 1997), and others led the charge for the inclusion of women in archaeological/bioarchaeological analyses and thoroughly enriched the discipline. See Moen (2019) for a recent review of ongoing discussions of gender in archaeology.

5.3.1 Children in Archaeology and Bioarchaeology

Children have also traditionally been underrepresented in the archaeological record. Children have been typically considered by archaeologists only to explain otherwise 'uninterpretable' materials, such as miniature objects and toys (Pierce, 1978; Santina, 2001). Many archaeologists have also dismissed children as randomizing or confounding agents on the distribution of materials deposited by adults (Kamp, 2001). A review of the literature on subadult archaeology in Ontario and the Great Lakes region shows that most archaeological studies that

have focused on children have been case studies of unique child burials (Fox & Molto, 1994; Savage et al., 1990). More recently, however, a bioarchaeological analysis of childhood diet and disease in earlier archaeological material has been undertaken (Watts et al., 2011). Although historical resources have covered this topic much more extensively (e.g. Belshaw, 2016; Parr, 1982; Rollings-Magnusson, 2009), syntheses with archaeological data are limited.

Over the past 20 years, archaeologists have increasingly recognized this underrepresentation (Hirschfeld, 2002; Kamp, 2001; Lewis, 2006; Sofaer Derevenski, 1994). These scholars have argued that archaeological analyses that exclude children are limited in their scope and their ability to accurately assess the demographic composition of past populations of interest. The *archaeology of childhood* emerged from this need for a renewed focus on the impacts that subadults have on the material record and their role in the broader social context of a site (Baxter, 2008). One of the central reasons that archaeologists should be interested in children invokes one of the tenets of contemporary anthropology – the idea that culture is learned. While cultural learning takes place over a lifetime, individuals undergo most of this learning as children. The subadult population is thus an important component of anthropological research into past lived experiences.

A post-processual approach (see Section 1.1) enables us to address what it meant to be a child and what is meant by 'childhood'. These seem like obvious questions, but this notion varies across social contexts and is crucial to our analysis of subadults in the potter's field. We can observe that childhood was likely a varied experience across the subadults buried in these cemeteries; there were individuals as young as two days buried in the St. Paul's potter's field (St. Paul's Cemetery, 1870). The social persona of an infant would clearly be different than that of an adolescent pauper or an asylum patient. These experiences can also be contrasted with the

childhood and social identities of children interred in Woodland Cemetery's main grounds, who may have experienced a more typical 19th-century childhood, as described by Sitara (2016).

5.3.2. Children in the Woodland Potter's field

One of the primary methods for obtaining information on the children buried in Woodland's potter's field was the examination of the burial records from St. Paul's cemetery, accessed through the London Room of the London Public Library (St. Paul's Cemetery, 1988). Age at death was not consistently provided in the records from St. Paul's Cemetery (as shown in Figure 10). A child's interment in the St. Paul's potter's field was often inferred based on descriptions under the column, "Quality, Trade, or Profession" or if the record keeper explicitly stated that they were interred in the "free grave" (Figure 11).

Figure 10

The Third St. Paul's Cemetery burial records (St. Paul's Cemetery, 1988)

Note. No age is recorded for an individual from the asylum (Yellow rectangle).

Figure 11

St. Paul's Cemetery's burial records (St. Paul's Cemetery, 1988).

Note. A variety of descriptions for the children, for example, an entry for the "free grave" (potter's field) (Blue rectangle) (accessed from the London Public Library).

The first two children shown in Figure 11, a six-week-old infant named Georgina Garver and a one-and-a-half-year-old child named Aron Green, are indicative of common records of subadults in the St. Paul's records. Often the most informative section in the burial records is the individual's "Quality, Trade, or Profession". For instance, the record in Figure 11 describes a 16-month-old child from England, John Housley, described as "a deserted infant" whose "Godmother committed suicide" (Figure 11). This record also notes that the individual was buried with no charge in the "free grave". While this clearly indicates this individual's status as a pauper, the "Quality, Trade, or Profession" entry for the very next entry, a 1.5-year-old individual named Alfred Payne, is left blank. This reflects the further marginalization of individuals who may have been similarly ostracized by society in life, limiting their identity to a name, a connection to the asylum, and the date of their burial (loss of identity – see Section 5.1, above).

Understanding the sequence of transfers from St. Paul's Cemetery to Woodland allows us to examine the deposition of children in the Woodland assemblage. Among the children interred

in St Paul's Cemetery before 1880, those from the asylum were transferred to Woodland's potter's field a month before the rest of the children from St. Paul's potter's field were transferred (Fillmore & Sayers, 2020).

6. Decomposition and Preservation of Human Remains

In order to understand whether or not late 19th-century burials will be detectable using remote sensing techniques, we must consider what we might expect in terms of their state of preservation. This involves a consideration of *taphonomy*, the study of the transition of organic materials (including bodies and coffins) from the biosphere (the living world) to the geological or archaeological record and how these materials may change over time once buried (Lyman, 1994). This term was originally coined by a Russian paleontologist, I.A. Efremov (Efremov, 1940), and was brought into the field of archaeology by R.L. Lyman (Lyman, 1994). A key taphonomic process for us to consider is the decomposition of the human body.

The decomposition of organic remains includes several steps which are outlined in Figure 12. Death induces autolysis (self-digestion), which in turn leads to the putrefaction stage, ultimately leading to liquefaction and skeletonization (Dent et al., 2004). Decomposition is an organized process by which cells are the first element affected leading to the breakdown of soft tissues by enzymes, bacteria, and fungi. While decomposition starts only a few minutes after death (if there is no intervention such as embalming of the body), the end of the process is quite variable. For a corpse interred in a coffin, decomposition of soft tissue leading to skeletonization is usually completed in 15-25 years, but timing can vary according to local environmental conditions (Fiedler & Graw, 2003). For example, temperatures below 0°C prevent decomposition, whereas higher

temperatures accelerate the process. The use of chemicals for embalming will also delay decomposition. For example, arsenic was used in the late 19th century to preserve bodies by killing the microorganisms responsible for decomposition (Konefes & McGee, 2001).

Figure 12

Overview of human decomposition stages

Death

Preparation (delay/embalming/coffin)

Burial

Autolysis (self digestion)

Hydrolytic breakdown of carbohydrates, proteins and fats

Putrefaction – release of CO_2, H_2O and gases

Anaerobic decomposition predominates

Liquefaction and disintegration

Skeletonization

Chemical/physical breakdown

Taphonomic processes
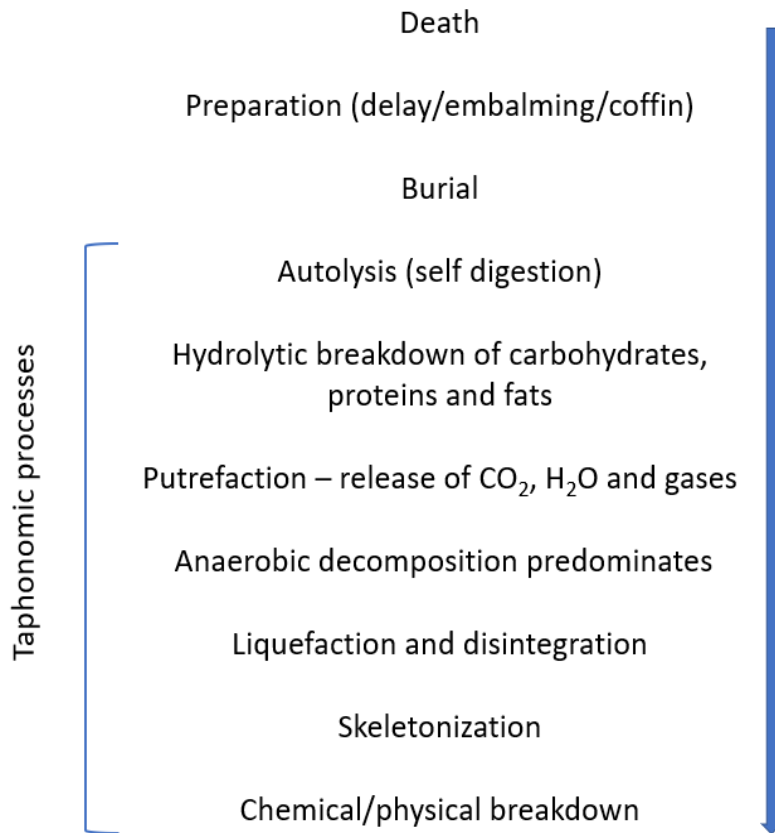
Note. (after Dent et al., 2004)

Autolysis

Autolysis, or self-digestion, starts a few minutes after death due to the disruption of the chemical balance in the body. After death, the pH increases in the body, disrupting cellular

membrane integrity and causing the accumulation of wastes such as carbon dioxide in cells (Gill-King, 1997). Concurrently, cellular enzymes dissolve the cells and soft tissues, releasing fluids rich in carbohydrates, proteins, and lipids within the body (Vass, 2001). Autolysis progressively affects the digestive organs, heart, air passage and lungs, renal system, brain and nervous tissue, skeletal muscles (in that order), and finally, the connective tissues like the tendons and ligaments (Gill-King, 1997). The first visible signs of decomposition are fluid-filled blisters on the skin and skin slippage (Vass, 2001). When enough nutrient-rich fluids have been freed in the body, and most of the oxygen used, the putrefaction stage begins (Dent et al., 2004; Vass, 2001).

Putrefaction

The putrefaction stage, also referred to as late decomposition, requires an anaerobic environment. The lack of oxygen promotes the growth of anaerobic bacteria such as the genera *Bacteroides*, *Clostridia,* and *Streptococci*, which further contribute to the destruction of soft tissues, generating gases, liquids, and simple molecules (Gill-King, 1997). During this stage, the degradation of carbohydrates, proteins, and lipids continues and causes the release of ammonia (an essential nutrient for plant growth), methane, hydrogen sulfide, cadaverine, and putrescine (Dent et al., 2004). The putrefaction stage can be recognized by a greenish discoloration of the skin, distension of tissues, and odour (Gill-King, 1997).

The distinctive smell of decomposition is caused by two gaseous products of protein degradation: putrescine and cadaverine, both of which are highly toxic (Gill-King, 1997). These gases will diffuse upwards in the soil. Additionally, lipids are degraded to fatty acids by bacterial enzymes. In the presence of oxygen, bacteria and fungi will degrade these by-products into aldehydes and ketones. If sufficient water and enzymes are present, hydrolysis will continue until the fat is reduced to a mass of fatty acids. Under the right conditions (a damp environment), the

saturated fatty acids will form adipocere, a grayish-white, paste-like substance, commonly known as "grave wax" (Gill-King, 1997). Adipocere can take a long time to degrade. A study in southern Ontario recorded the presence of adipocere on remains over a hundred years old (Pfeiffer et al., 1998).

Liquefaction and Skeletonization

Following putrefaction is the liquefaction stage in which soft tissues become a semi-fluid mass of water and putrefied tissues (Dent et al., 2004). The liquified tissues are eventually released in the environment when the coffin degrades, and can then enter the soil and groundwater system (Dent et al., 2004). The disintegration and liquefication of soft tissues leave the skeletal remains behind, in what is referred to as the skeletonized stage. The rate of decomposition in this stage is highly dependent on the burial environment (Clark et al., 1997). Bones are mainly composed of organic collagen and inorganic hydroxyapatite. The organic phase is eventually eliminated by the enzyme bacterial collagenase (Nawrocki, 1995). Therefore, when skeletonization is complete, only the inorganic component of the bone remains.

6.1. Environmental impacts of decomposition

Even after death, the individual continues to interact with the immediate environment, enduring multiple post-mortem changes. The integrity of cells and soft tissues is compromised, tissues disintegrate into their sub-components (carbohydrates, proteins, and lipids) and bones are demineralised. Often, in the context of a "sealed" coffin, skeletonized remains with adipocere are found. However, if the individual was embalmed the outcome may differ. While the external conditions influence the decomposition rate and preservation, many by-products are also released into the environment. Among these are amino acids, ammonia, and phosphate, which offer

nutrients to vegetation and microbes. However, more dangerous compounds such as cadaverine or heavy metals such as arsenic, mercury, and lead used for embalming during the late 19th century are also able to enter the environment following decomposition. These compounds can go on to enter the soil, groundwater, and above-ground water systems (Spongberg & Becks, 2000; Dent et al., 2004). It is unclear what the health risks of these by-products may be or how long they may persist in the environment. Some studies have recorded a high level of gases (Gill-King, 1997) and organic chemicals (Benninger et al., 2008) near decomposed bodies, contaminated groundwater samples (Pacheco et al., 1991), and high levels of heavy metals in cemeteries (Amuno, 2013; Spongberg & Becks, 2000). Considering this is an old cemetery, the remains are likely skeletonized and most of the chemicals associated with the bodies will have already leached into the environment over time. For example, phosphate from decomposed remains is only detectable for ca. 100 days following interment in a temperate woodland environment (Benninger et al., 2008). Heavy-metal compounds are more problematic since they can undergo bioaccumulation, making it impossible to know how long they can represent a health threat. In a study of cemeteries in Northeast Ohio from the late 1800s, Spongberg & Beck (2000) detected compounds such as arsenic, lead, copper, and zinc in high concentrations after a century. However, according to a study of a Rwandan site performed by Amuno in 2013, even if heavy metals are found in high concentration in cemeteries, they do not represent a toxic risk to ecology. It is also important to note that, due to the additional costs that embalming would incur, most of the individuals buried in the potter's field would not have been embalmed with the toxic components. However, some individuals from the main part of the third St. Paul's cemetery, whose families could not be contacted, were moved to the potter's field at Woodland (Section 2.1). It is possible that some of these individuals were embalmed.

6.2. Factors affecting decomposition

Each decomposition stage mentioned above requires specific conditions to be optimal, for example, the damp, low oxygen environment necessary to allow adipocere formation (Gill-King, 1997). Thus, many variables can influence the decomposition of the body and its subsequent preservation. Despite being numerous, these factors can be regrouped into three main categories: environmental, individual, and cultural.

Environmental Factors

The decomposition and the subsequent preservation of organic remains is context-dependent, varying by burial depth, physical soil type, soil chemistry, the presence of microorganisms, oxygen availability, water exposure, and the style of burial: casket/coffin vs. burial shroud, and single vs. multiple burial.

Other than the sheer number of burials in the study area identified, the GPR was also able to indicate the depth of the burials (see Section 7). This is relevant to both decomposition and preservation of organic remains because burial depth dictates the degree of exposure to surface environmental conditions such as precipitation and temperature. Depth is also relevant to exposure to scavengers, such as coyotes, which are present in the forested areas of London. The GPR scan revealed notable variation in burial depth, with some interments as shallow as 20-30 cm while others are as deep as 130-140 cm. Direct comparisons can be drawn with the Oneida Burial site in New York state, which is a potter's field uncovered during construction at what was once a Psychiatric Asylum (Nawrocki, 1995). Here, excavations revealed that the preservation of the remains was directly associated with burial depth where individuals who were closer to the surface,

were in poorer states of preservation than those buried deeper (Nawrocki, 1995). The freeze-thaw cycle affects the preservation of skeletal remains in shallow graves by contributing to bone warping and overall degradation (Nawrocki, 1995). In Southwestern Ontario, the frost penetration during the winter can range from 61 to 122 cm, therefore, the burials that were identified within the upper meter are likely to have been affected by this process (Armstrong & Csathy, 1963).

Another factor that directly affects decomposition rate and preservation is the physical texture of the soil. Looser, sandier soils allow water and gasses to move more freely to and from the body, whereas more tightly packed, clay-containing soils prevent gas exchange (Tibbett, 2008). Exposure to gasses, specifically oxygen, speeds up the process of decomposition as oxygen is required by the aerobic bacteria which aid in breaking down the body (Dent et al., 2004). Water also drives decomposition processes as it hydrolyzes proteins, breaking them down into smaller polypeptide units. This contributes to the breakdown of tissues during decomposition, and at later stages, affects bone preservation by degrading the organic portion of bone (Nawrocki, 1995). The soil in the section of Woodland that contains the potter's field is described by the Woodland staff as containing more clay than other areas of the cemetery[4]. This could potentially contribute to better preservation of the skeletal remains of these individuals, especially those buried deeper who would be further removed from the surface conditions such as the freeze/thaw cycle.

Soil chemistry is also an important variable that directly affects the rate of decomposition and the ultimate preservation quality of skeletal remains. Of specific interest is pH, which is a measure that indicates where on the spectrum of acidic to alkaline the soil falls. Studies of decomposition in soils of varying pH have shown that organic remains interred in acidic soils (pH

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[4] Inspection of the site on June 25, 2020 encountered sandy deposits excavated by a woodchuck, suggesting that sand was present in at least the surface strata of this area.

< 7) decompose at a higher rate than remains interred in alkaline soils (pH > 7) (Tibbett, 2008). Soil pH is highly variable, depending on the inorganic/mineral makeup of the soil in addition to the number and types of plants or trees in the area. On the eastern border of the potter's field at Woodland there is a row of coniferous trees that line the fence that separates the cemetery from a residential area. From the GPR analysis, we know that the root systems of these trees reach into the interments, suggesting infiltration of these burials (see Section 7). The presence of conifers is known to affect the pH of soil, acidifying it to a depth of 40 cm (pH -0.18 ± 0.08, mean ± SE) (Augusto et al., 2004). Furthermore, tree roots excrete acidic substances that will erode bone leaving an etched spiderweb or branching appearance (Nawrocki, 1995).

In addition to pH affecting decomposition and preservation, the decomposition of organic remains also directly alters the pH of the soil. The ammonia created during decomposition leaches into the surrounding soil, causing it to become more alkaline (basic). In the case of soil that is already alkaline, this process does not significantly alter the pH. However, if the soil is initially acidic, the ammonia released can cause the pH to rise upwards of three units, making it 1,000 times more alkaline (Tibbett, 2008).

Finally, we can directly consider the skeletal remains of the individuals interred in the potter's field, specifically, how they may present in the case of an excavation. The number of individuals in a grave cut affects both decomposition and arrangement. From historic records and personal communication with Woodland archivists it has been indicated that several of the grave cuts may represent multiple interments or mass burials from the third St. Paul's Cemetery. This is further supported by the GPR evidence which indicates possibly overlapping grave cuts as well as cuts at various depths. Potter's fields are often referred to as mass burials. Forensic studies of decomposition in the case of a mass burial have identified that the rate of decomposition varies

with body position, with individuals in the centre or bottom of the burial decomposing slower than those closer to the peripheries (Troutmant et al., 2014). These processes contribute to the comingling of remains as well as the slumping of the grave on the surface. As the bodies decompose differentially, the space that was once taken up by soft tissue or by the coffin is filled with dirt. As bodies on top or on the peripheries decompose first, bones and objects interred with that individual may migrate down, potentially contributing to the comingling of these individuals. Insect or animal activity as well as the freeze-thaw cycle can also contribute to the movement of bones or other objects within the burial context. The interval of time that passes between death and interment determines the degree of exposure to insects, such as flies, which lay their eggs in rotting organic material as part of their life cycle. As discussed in Section 5.3, in the case of the London Asylum for the Insane, patients who died were often left in their beds while awaiting arrangements for interment. This practice would have increased the likelihood of exposure to insects. Left long enough, maggot activity is known to actively influence bone position, often causing disturbance of the ribs and other bones within the burial context (Nawrocki, 1995). Positioning of bones can also be directly affected by the mortuary tradition, specifically if the individual was shrouded or not. In individuals who were shrouded before interment, this tradition can be recognized in skeletal remains by the presence of transverse compression of the shoulders (Stutz & Larsson, 2016). Collectively, these environmental and physical factors contribute to the ultimate presentation and preservation of the burials at the potter's field.

Individual Factors

In addition to the physical remains of the individual, bioarchaeologists also use non-biological indicators of status and identity, such as grave goods, to inform their studies of the past. These factors make each individual burial in the potter's field unique and constrain the amount

and type of information anthropologists are able to glean about the individual, their embodied life history, and the society in which they existed. These features inform us about identity, but they can also affect preservation.

The physical characteristics of an individual such as their age-at-death, sex, height, and weight will influence the decomposition rate (Fiedler & Graw, 2003). A tall, overweight, adult male (or female) will decompose at a slower rate compared to a teenage female, due to the difference in body mass and composition. The bone density of males also tends to be higher than that of females and subadults, increasing their chance of preservation. Indeed, children's remains undergo decomposition processes faster due to their size and a greater surface area-to-volume ratio (Morton & Lord, 2002). Moreover, their bones are smaller and more fragile, increasing the likelihood of them being damaged or lost. Bones undergo a considerable increase in density from the fetal period, through childhood, peaking in the early adult phase (Trotter & Hixon, 1974). Overall, the skeletal material of children is less resistant to soil compression and their bodies decompose faster than those of adults.

The lifestyle of an individual can also impact the decomposition rate of their body. A study by Cockle (2013) indicated that the increased consumption of alcohol and drugs prior to death slowed the decomposition rate as well as causes significant perimortem blood loss.

Cultural Factors

The category, "cultural factors", includes all the elements involved with the burial tradition itself. This includes factors such as clothing, the material of the coffin and structure, the presence of multiple burials within the same cut, the embalming or preservation practices employed, and others. Cotton clothing is known to decay within a few months (Janaway, 2008), and following its

degradation, body decomposition rate increases. The presence of a wooden coffin can also accelerate the putrefaction stage, possibly due to the increased presence of oxygen (Forbes et al., 2005), as the air within a coffin contains approximately 150-200g of oxygen (Dent et al., 2004). Moreover, untreated wooden coffins tend to decompose faster, leading to accelerated leaching of liquids into the environment. Embalming with arsenic was the primary embalming procedure until 1910 when the practice stopped partly due to health concern for embalmers who were being exposed to its high toxicity (Konefes & McGee, 2001). Arsenic is known to alter enzymatic reactions (Abernathy & Ohanian, 1992; Knowles & Benson, 1983) and kill microorganisms (Konefes & McGee, 2001), but no research has been conducted on the long-term impact of arsenic embalmment on the decay process. However, modern embalming using formaldehyde causes slower decomposition onset and the mummification of skin and muscles instead of skeletonization (Keaton, 2012). At this time, embalming likely involved considerable additional costs (Konefes & McGee, 2001), and thus, might not have been implemented on most individuals relegated to the potter's field. As noted above, individuals from the regular part of St. Paul's Cemetery, whose families could not be contacted, were buried in the Woodland potter's field. These individuals may have been embalmed.

Wesleyan Cemetery Burials

The burials recovered in 2003 from the Wesleyan Cemetery, located immediately south of the third St. Paul's Cemetery, on the grounds of what is now the Western Fair, can provide an indication of what the state of preservation of the Woodland burials might be. The skeletons are described as being in "excellent" condition (Archaeologix, 2007: 41). However, no wood from the coffins is described in that report, although a large quantity of metal coffin hardware was recovered. Grave goods and other grave inclusions included metal, bone, and ceramic artifacts

(Archaeologix, 2007: 27-28). These were individual interments, rather than the possibly stacked, mass interments at Woodland, so specific decomposition conditions would differ. However, it is likely that skeletal elements are preserved in the Woodland potter's field.

Summary

Collectively, environmental, individual, and cultural variables contribute to both the processes of decomposition and preservation and ultimately influence the observations and conclusions that bioarcheologists can draw.

7. Physical Analysis of the Potter's Field

This section will present the use of, and principles behind, the application of remote sensing techniques in archaeological sites and cemeteries. The two non-destructive remote sensing methods used here are ground penetrating radar (GPR) and magnetic susceptibility (MS). This section will also present the analysis of the data acquired and its interpretation. The interpretation must be put in the context of what we know historically about how this potter's field was populated (Sections 2 and 3), and what we have just discussed (Second 6) about taphonomy and decomposition. These analyses provide the cemetery's administration with valuable information to guide preservation and planning discussions surrounding this part of Woodland Cemetery.

7.1. Geophysics and Grave Location

Geophysical survey techniques provide a rapid, non-intrusive means of identifying and mapping sub-surface features. Because of this, they have become an integral tool in the identification and mapping of archaeological sites and landscapes in many parts of the world (Clark, 1990; Gaffney & Gater, 2003; Johnson, 2006; Scollar et al., 1990). However, despite the ability of geophysical techniques to detect a wide range of archaeological features, grave detection with geophysical instruments presents several technical challenges that make data interpretation particularly difficult.

The ability of any geophysical instrument to identify buried features will depend on the degree to which the physical and chemical properties of the target objects differ from the material in which they are buried. As graves are usually backfilled with the same soil that is excavated out of the grave shaft, there is often not enough physical difference in the properties of the grave fill

to distinguish it from the surrounding soil once the interment (including a burial casket) has collapsed and decayed (Dionne et al., 2010; Jones, 2008). Additionally, the burials themselves are often too deeply buried for detection by geophysical techniques, as most of the more common approaches can only identify features up to one meter below the surface.

Despite these difficulties there are some circumstances that provide suitable conditions for grave detection. Graves that contain coffins are sometimes detectable through magnetometry (Jones, 2008) or conductivity (Beven, 1991) due to the metal used in their construction, as long as the coffin is not too deeply buried. Alternatively, the surface of the coffin lid or air voids within the coffin can produce reflections in a GPR survey (Dionne et al., 2010; Jones, 2008), although this is only applicable in circumstances where the coffin remains relatively intact, such as recent burials. The vertical interface of the grave shaft is generally more difficult to detect, as most radar energy travels parallel to the shaft (Conyers, 2013). One exception to this is in highly layered sediments where the fill of the grave becomes homogenized during back filling and is recognisably different in a GPR profile to the layers surrounding it, which retain the natural stratigraphy (Beven, 1991; Conyers, 2013).

Grave fills are also potentially detectable in instances where the fill, having been disturbed through excavation, drains at a slightly different rate from the surrounding soil. Additionally, the grave fill may include water-enriched ions and calcium salts from the decomposition of human bodies (see Section 6). Both of these processes result in slightly different electrical properties to the surrounding soil, which are detectable through earth resistance meters and GPR (Ellwood, 1990; Jones, 2008; Matias et al., 2006; Mellet, 1992). As with all geophysical surveys in archaeology, the potential success will be site specific and will vary depending on a variety of environmental and archaeological conditions.

Of the various geophysical instruments outlined above, ground penetrating radar has become the most widely used for grave detection (e.g. Bevan, 1991; Conyers, 2006b; Jones, 2008; Nobes, 1999; Schulz & Martin, 2011; Solla et al., 2012). For instance, Fiedler et al. (2009) used GPR on a historic cemetery in the Black Forest region of Germany. The cemetery was under 50 years old but was no longer in use and it contained unmarked graves. Researchers identified a grid of burials, as expected, but also detected 97 graves where only 95 were previously recorded (Fiedler et al., 2009). In Treblinka, a Polish labour and extermination camp from World War II, researchers used GPR to identify scattered remains on the camp's grounds because Jewish law forbids excavation (Colls, 2016). However, Colls (2016) has not yet been able to detect any mass graves at this site, which would be expected for an extermination camp. If any mass graves exist, they are believed to be under a section of the camp covered by dense vegetation, making GPR ineffective in that area (Colls, 2016). GPR can be extremely important to law enforcement when searching for the graves of missing persons (Powell, 2004; Salsarola et al., 2015). Imaging techniques may be the only option when excavation is not possible or practical.

Ground penetrating radar can be used to identify burial patterns within cemeteries. Differences in patterns may reflect variation in identity, values, religion, and more, and can be used to identify groups (Conyers, 2006b). For instance, GPR was used to locate the Mapoon Mission cemetery in Queensland, Australia (Sutton et al., 2013). This indigenous cemetery is culturally significant because of its use both before and after the introduction of Christianity to the Australian Aboriginals. Sutton et al. (2013) located the unmarked graves and identified Christian graves based on their east-west orientation among the pre-contact burials, which did not have a preferential orientation. Additionally, Ruffel et al. (2009) used GPR to identify graves based on religious practices in a 150-160-year-old Irish cemetery. The authors detected a separate burial

area for those who were unbaptized, not unlike a potter's field. Within the larger cemetery the authors believe they can differentiate Catholic burials from Protestant ones based on the use of metal detectors in combination with the GPR to look for metallic objects in some graves, presumed to be crucifixes, rosaries, or other religious items on or in the caskets of catholic individuals (Ruffel et al., 2009).

7.2. Ground Penetrating Radar

Ground penetrating radar (GPR) propagates radar waves from a surface antenna, which reflect off buried objects, bedding contacts, and soil media that are detected back at source by a surface receiving antenna (Conyers, 2006a). As the radar wave passes through the ground, each time it encounters a different material, some of its energy is reflected back to the receiving antenna. The remaining energy continues deeper into the ground, to be further reflected by subsequent targets, until it eventually dissipates with depth. It is, therefore, possible to record multiple layers and objects at different depths within a survey area. GPR surveys are processed using computer software to produce two-dimensional reflection profiles that enable the study of the results in vertical profile (like looking at a slice through a cake), or more commonly, they are stacked together and resampled into horizontal plans referred to as amplitude or time slices, allowing the data to be investigated in plan view (as if looking down from above) (see Figures 26 and 22 for examples of vertical and horizontal views).

The depth to which one can survey with GPR is dependent on the frequency of the antenna used and the physical and chemical properties of the material through which the radar wave travels (Conyers, 2013). The frequency of the antenna will also determine the size of the object that can be identified. For example, while low-frequency antennas (e.g. 10 MHz) can locate features up to 50 m in depth, they can only identify very large subsurface features because they transmit energy

with wavelengths of many meters, making them unsuitable for archaeological use (Conyers, 2006a). Archaeological prospection generally employs antennas with a centre frequency ranging from 900 MHz (ca. 1 m penetration) to 250 MHz (ca. 9 m penetration), with antennas ranging between 250 MHz-500 MHz preferred for grave prospection. We used a 500 MHz antenna.

Like all geophysical techniques, the ability of GPR to identify buried objects depends on the degree to which the target objects differ from the material they are buried in. All soils and archaeological features have particular electrical and magnetic properties that will affect the velocity of a radar wave (Conyers & Goodman, 1997). This is known as the relative dielectric permittivity (RDP). As a radar wave travels between two materials with different RDP, a portion of the radar wave is reflected back at the interface between the two materials to the surface receiver. The greater the differences in the RDP of materials, the greater the recorded amplitude of the reflected wave and the more visible the object is to the GPR receiver. As different soils and sediments will have different RDPs, the degree to which a GPR survey will be successful is necessarily site specific.

Ground penetrating radar units, unlike most other geophysical survey instruments, are also able to provide some information on the depth of buried objects, since GPR units record the time taken for a reflected wave to travel to and from a subsurface feature. If the RDP of the soil is known, then the velocity of the radar wave can be established and the depth of the buried object calculated. However, it is important to note that in most instances, including the potter's field survey, the RDP is not known and it is, instead, estimated based on a calculation called "migration" made in the GPR software. Migration calculates the velocity of the soil based on the shape of hyperbolic reflectors (the "A" shapes) observed in the data. The broader the hyperbolic reflectors,

the faster the radar signal is travelling through the ground. All depths presented in this report are, therefore, estimates only.

7.3. Magnetic Susceptibility

Magnetic susceptibility (MS) survey is a technique that measures the degree to which materials become magnetized in the presence of a low magnetic field. For archaeological surface surveys, we are mostly interested in the magnetic susceptibility of soils. Without the right geological conditions, magnetic susceptibility will not work at all. While there are many factors that can influence the magnetic susceptibility of soils, the most significant factors for area surveys in cemeteries are the geological parent material, which provides the magnetic mineral content from which the soil is derived (Clark, 1990; Tite, 1972) and pedogenic (soil forming) processes, which enhance the magnetism of the surface soil (Maher & Taylor, 1988). It is important to note that, as the sensors used in magnetic susceptibility area survey are only able to penetrate approximately 10 cm, we are only concerned with differences in the magnetic susceptibility very near the surface.

In cemeteries, differences in the magnetic susceptibility of the surface soil are most likely to occur when the topsoil and subsoil are mixed together when the grave shafts are excavated and refilled (Kainz & Cotter, 2018). The soil that ends up at the top of the grave shaft will often be slightly mixed, resulting in different magnetic susceptibility values in the grave shaft compared to the surrounding undisturbed soil, which has the potential to be detectable during a magnetic susceptibility survey.

Traditionally, due to the relatively slow speed of data acquisition, magnetic susceptibility area surveys tend to use fairly coarse sampling densities, sampling every 10 m (e.g., Cook & Burks, 2010; Nolan & Redmond, 2015; Roos & Nolan, 2012). These types of survey, while
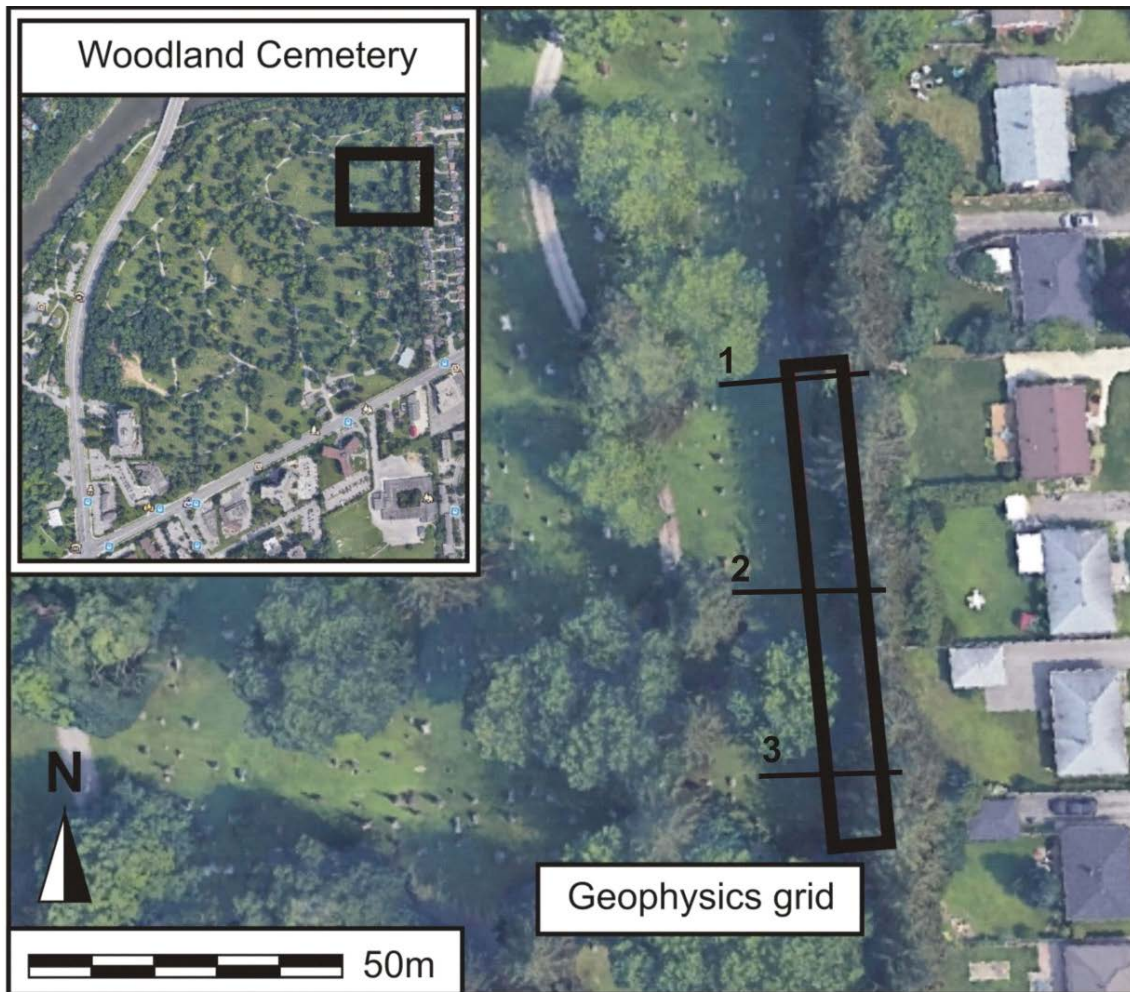
suitable for identifying archaeological sites within landscapes, do not provide the spatial resolution necessary to identify individual features such as graves. Even close interval surveys that sample every 1 m, whilst successfully used to identify features within sites (e.g. Hodgetts et al., 2015), are still relatively coarse and have the potential to miss smaller targets such as infant burials. Therefore, we adopted an extremely high sampling density of 25 cm. While this approach is almost never used in grave detection, some studies (e.g. Dalan et al., 2010, Dick et al., 2017), have shown that the technique is capable of detecting differences in the magnetic susceptibility of grave shaft fill from the adjacent substrate and has the potential to map the location of unmarked graves.

7.4. Methods

On March 8th, 2020, students from Western University, under the supervision of Dr. Andrew Nelson and Edward Eastaugh, conducted a geophysical survey on the southern section of the potter's field (as identified in the cemetery's records) located on the eastern margin of Woodland Cemetery (Figure 13). The aim of the survey was to locate and map unmarked graves within the potter's field.

Figure 13

Location of the geophysical survey area and three transects at the Woodland Cemetery

Note. Basemap: Google earth
https://www.google.com/maps/place/London,+ON/@42.9692731,-
81.2916077,542m/data=!3m1!1e3!4m5!3m4!1s0x882ef20ea88d9b0b:0x28c7d7699a056b
95!8m2!3d42.9849233!4d-81.2452768

As discussed above, we used two geophysical survey instruments to locate the graves: a

ground penetrating radar unit and a magnetic susceptibility meter. As GPR is, in most survey

conditions, the best suited technique for the identification of unmarked graves, we used this

approach to survey our entire study area. However, we were worried that the roots from the

adjacent tree line would cause substantial noise in the data and obscure the grave reflections. We,

therefore, surveyed a single 10 x 7 m grid square with the MS meter at high resolution to establish its utility for area survey.

The geophysical survey area in the potter's field measured 60 m (N-S) by 7 m (E-W) and was oriented to encompass a strip of grass running between and immediately east of the headstones in plots C and EC and a line of fir trees that run along the cemetery's eastern fence line (Figures 14 and 15). This area is marked by a general absence of headstones (there are two small markers lying flat on the surface). The survey conditions were good, consisting of a flat, manicured grass with few obstacles. The area was raked prior to the survey to remove numerous fir cones and debris which would have impeded the data collection. While the soil at the cemetery is recorded as sandy clay (Department of Planning and Development, 1952), conversations with the ground keepers, indicate that the soil is not uniform and can range from almost pure sand (close to the river) to clay rich deposits. Standing water in the survey area two days prior to the survey suggests that the soils within the potter's field are more likely clay rich and water saturated.

Figure 14

Photograph showing the survey area (facing south) three days prior to the survey

Note. Photo by Meagan Fillmore.

Figure 15

Location of the geophysical survey area in relation to the burial plots at the Woodland Cemetery. Plot map from Woodland Cemetery.
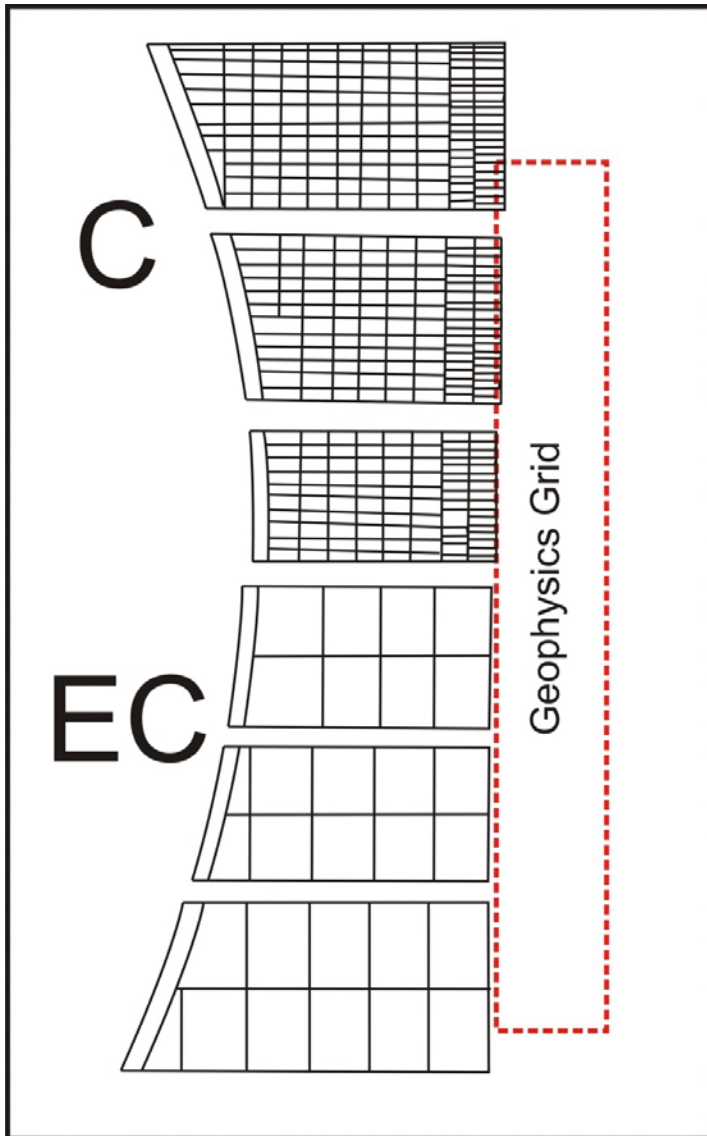
We laid out the survey area with tapes and divided it into six 7- x 10-m grids to better facilitate data collection. We surveyed the corners of the grid, along with the adjacent head stones and trees, with a total station theodolite and imported the data into the GIS software ArchMap v10.8. We subsequently georeferenced the corners of three surveyed headstones to the corresponding headstones observed on 30-cm resolution air photographs, collected under the 2010

Southwestern Ontario Orthography Project (SWOOP, 2015), to align the two data sets and situate our survey grid within the cemetery.

For the GPR survey, we used a Sensors and Software 500 MHz Noggin system configured with a tow wheel and DVL 500 data collector. We collected GPR scans every 2 cm along parallel traverses, spaced 25 cm apart and oriented north-south in order to cross the graves perpendicular to their length, thereby reducing the chance of missing any smaller child burials. We processed the data in EkkoProject v5 into amplitude time slices, which show the results in plan view and incorporated them into our GIS model. Processing in EkkoProject follows a standard data processing stream and includes Dewow (a.k.a. signal saturation correction), envelope, and migration routines. These processes remove the low frequency noise of the transmitter, convert the oscillatory positive/negative nature of the radar wavelet to a signal with all positives, and focus the energy spread of the hyperbolic shape of reflections back to the apex of the hyperbola to make them easier to identify. The migration process also allows the depth of targets to be estimated by using a hyperbola velocity calibration that is based on the shape of a hyperbolic reflector of a target in the raw data.

For the magnetic susceptibility survey, we collected data with a Bartington MS3 magnetic susceptibility meter configured with a MS2D surface scanning probe and Trimble Nomad data collector running Bartsoft software. We logged readings at 25-cm intervals along transects spaced 25 cm apart. Logged readings were imported into ArcGIS where we converted them into an interpolated surface using the inverse distance weighting function, an interpolation method that makes the assumption that things that are close to one another are more alike than those that are farther apart. Experience has shown that this interpolation method is good at defining magnetic highs in the data set. The survey methodologies we employed at the Woodland Cemetery meet or

exceed the standard recommended methodologies for research projects (see Conyers, 2002, 2013, Kvamme, 2003, Neubauer et al., 2002).

See Figures 16 to 21 for photographs of the activities of the fieldwork day.

Figure 16

Ed Eastaugh giving group members a tutorial of the GPR equipment

Note. Photo by Andrew Nelson.

Figure 17

Operating the Total Station
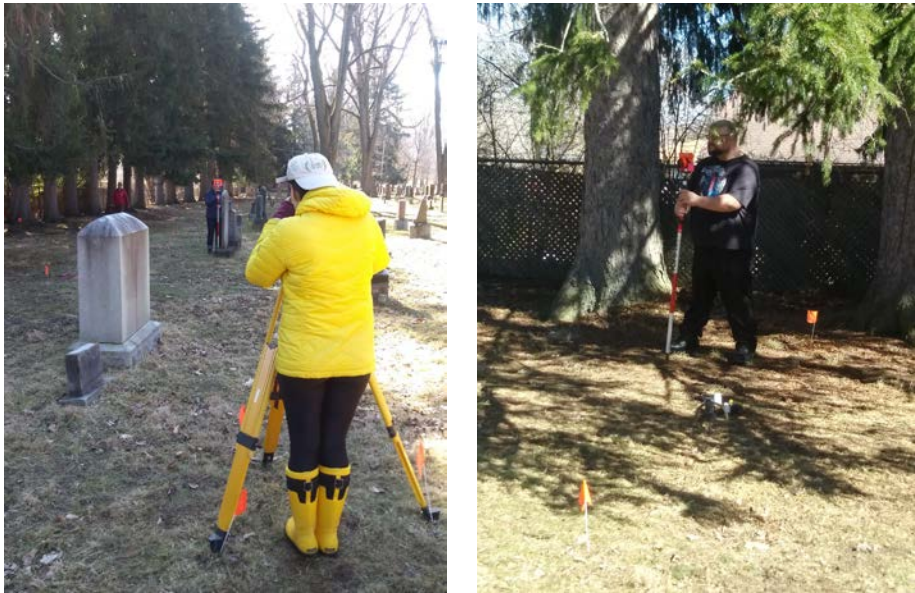
Note. A. Nicole Phillips (blue) and Isabella Vesely (yellow) operating the total station. B. David Seston holding the reflector. Photos by Andrew Nelson.

Figure 18

Members of the group beginning their GPR

Note. Photo by Cameron Beason.

Figure 19

Operating the GPR

Note. Lauren Poeta (left) operating the GPR while Teegan Muggridge (right) aligns the transects. Photo by Andrew Nelson.

Figure 20

The Ground Penetrating Radar Unit

Note. Ed Eastaugh setting up the GPR unit. Photo by Andrew Nelson.

Figure 21

Operating the Magnetic Susceptibility reader

Note. Isabella Vessely (left) and Hope Atkinson (right) operating the Magnetic Susceptibility reader. Photo by Andrew Nelson.

7.5. Results

7.5.1 Ground Penetrating Radar Results

The results obtained by the GPR survey exceeded our expectations. An examination of the data in plan view shows numerous rectangular, high-amplitude reflections (seen as red) oriented east to west and measuring approximately one meter by two meters running the length of the survey area (Figures 22 to 25). Given the shape, size and orientation of the anomalies, and the context of the survey in a cemetery, we can be confident that these reflections represent grave shafts. The results also show two irregular high amplitude reflections measuring between four to five meters square (indicated as A and B on Figure 24). Feature A coincides with a small horizontal head stone set into the ground and represents at least three graves that lie beneath. Feature B, while similar in shape, corresponds to what is known as an "airwave" in the data, resulting from tree branches overhanging the survey area. While GPR antennas are shielded to ensure that most energy is transmitted into the ground, some of the energy travels upwards and can be reflected off features above the survey area. Fortunately, they are readably identifiable as broad hyperbolas in the profile data (Figure 26).

Figure 22

Results of GPR survey showing the high-amplitude reflections observed in the time slice at 20-30cm below surface (left) and an interpretation of the graves they represent (right)
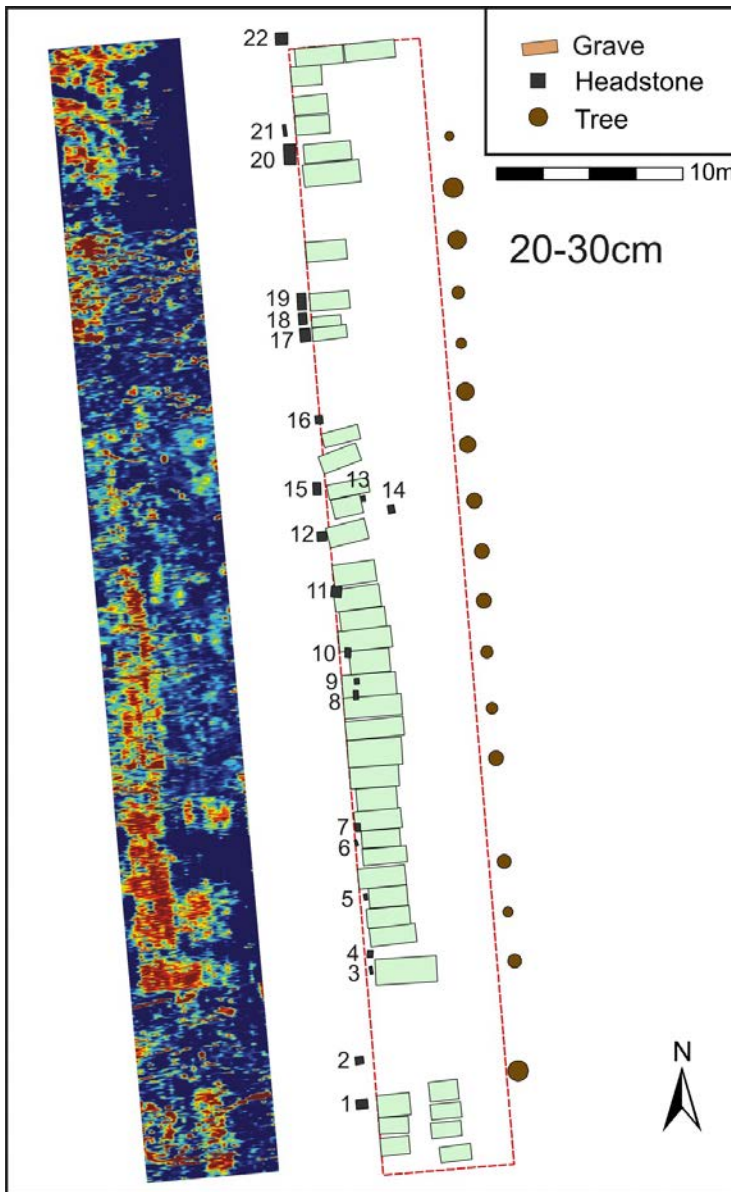
Note. Grave numbers relate to the headstones in Table 1.

Figure 23

Results of GPR survey showing the high-amplitude reflections observed in the time slice at 40-50cm below surface (left) and an interpretation of the graves they represent (right)

Note. Only new graves identified at this depth are included in the interpretation. Graves identified at shallower time depths are not included. Grave numbers relate to the headstones in Table 1.

Figure 24

Results of GPR survey showing the high-amplitude reflections observed in the time slice at 95-105cm below surface (left) and an interpretation of the graves they represent (right)

Note. Only new graves identified at this depth are included in the interpretation. Graves identified at shallower time depths are not included. Grave numbers relate to the headstones in Table 1. Labels A and B indicate large irregular features (see text for discussion).
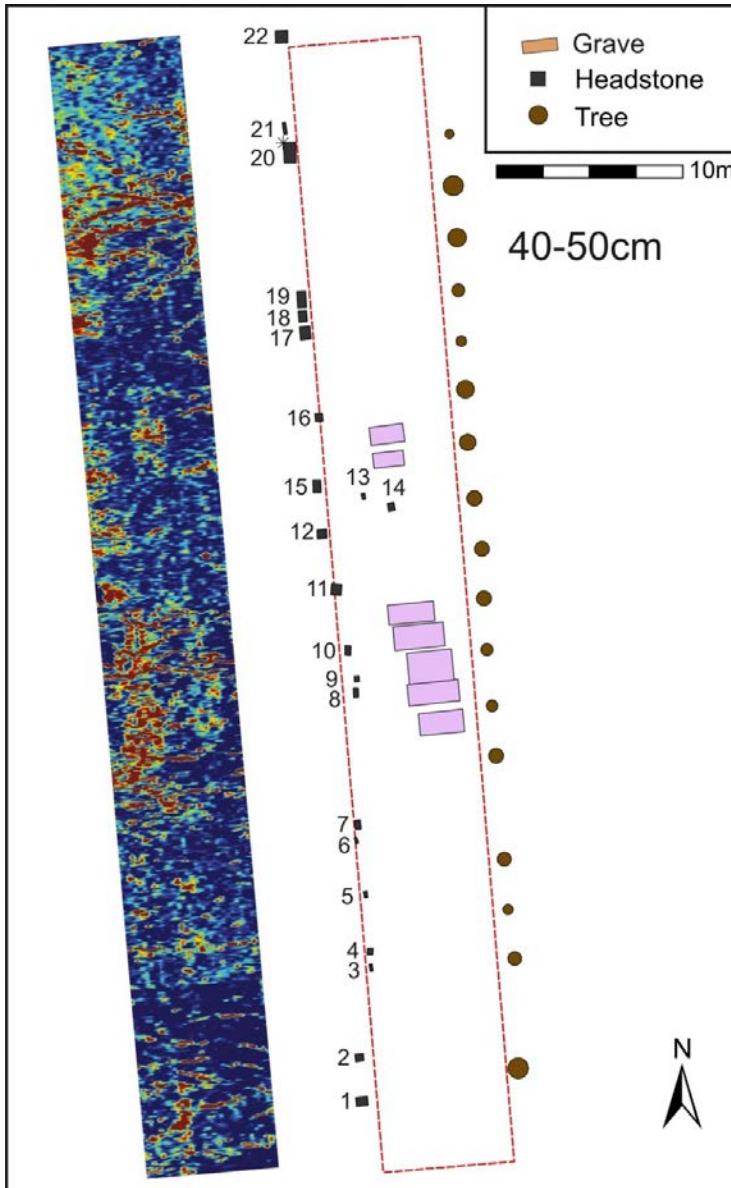
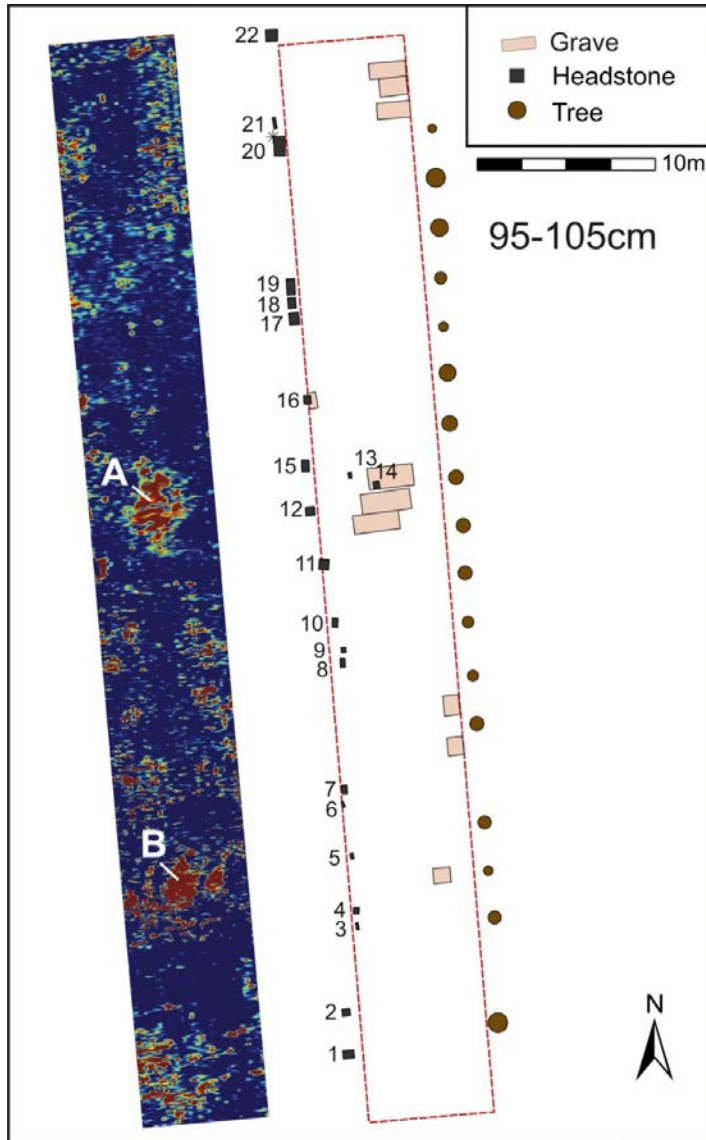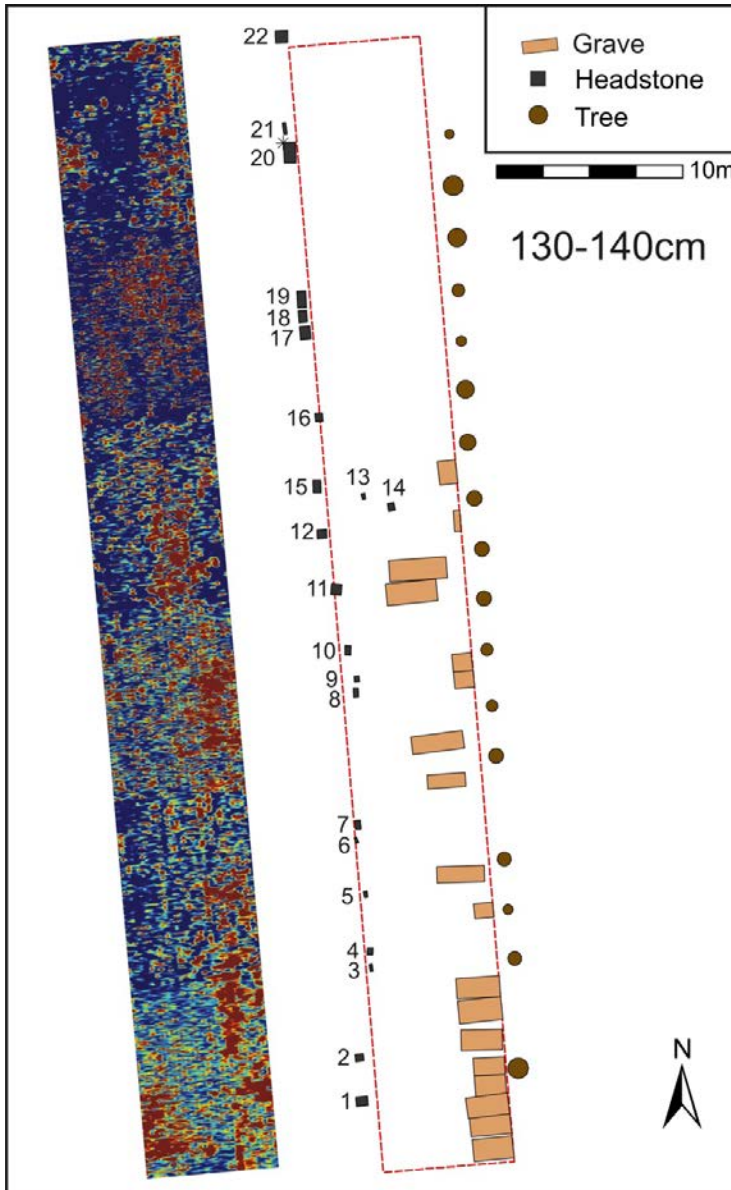**Figure 25**

Results of GPR survey showing the high-amplitude reflections observed in the time slice at 130-140cm below surface (left) and an interpretation of the graves they represent (right)

Note. Only new graves identified at this depth are included in the interpretation. Graves identified at shallower time depths are not included. Grave numbers relate to the headstones in Table 1.

Table 1

Transcription of visible inscriptions on the headstones adjacent to the survey area

ID #	Name	Date of Birth	Date of Death	Comment
1	Nancy E		Feb 6, 1905	Wife of Anthony Adair
2	John W. Egan		July 9, 1906	
3	Peter Hartnell		Dec 12, 1914	Aged 3 years
4	Norman		May 5, 1916	Son of Joe and Susan Johnston, in his 7th year
5	Dorise(?)		Apr 2, 19_ _	Daughter of _____
6	Grace Fowler Maud		June 30, 1913	Daughter of Wm and Mary, aged 5 yrs 5 mos
7	Freddy Lindsay	1904	1913	In loving memory
8	Arthur, Lindsay Bowler		Jan 1910	Son of Samuel and Minnie Boyer
9	Joseph Linnell		Jan 12, 1910	
10	Lilian Rose		Oct 24, 1906	Daughter of Rochard and Rose Taylor, aged 5 yrs 4 mos 13 days
11	Cecil Henry		Sep 20, 1902	Son of Frank and Edith Vann, aged 5 yrs and 3 mos
12	Mary Emily		Jun 18, 1902	Beloved wife of John Hopkins, aged 52 yrs 8 mos Mother, thou art gone before us and they saintly soul is _____ where tears are wept from every eye and sorrows unknown
13	Isabella Summerfield	1827	1902	
14	Louis Richard		1947	Infant son of Ila and Louis Patience
15	George Rudston Carthorne	Mar 8 1834	May 2, 1902	Also his wife Agnes Strouther born May 1, 1841 died May 29, 1910
16	Bert Spincknell		Dec 24, 1899	Aged 23 yrs
17	Thomas Moore Tripp	Jan(?) 8, 1825	Jan(?) 25, 1902	At rest
18	Wm. R. Tanner	Aug 21, 1901		Aged 42 years 8 mos
19	Eliza G		May 24, 1899	Wife of William Meredith, aged 65 years
20	William MacNeill	Mar 21, 1824	Jan 28, 1899	And his beloved wife Anne Galloway Dec 24, 1825 – Jan 29, 1899
21	Gordon R Herald		Jan 5, 1899	Son of Albert and Jennie Herdo, aged 12 years
22	James Pond	Sep 2, 1815	Feb 15, 1908	Native of Bath England

Note. See Figures 16 to 19 for locations. Numbered from South to North.

Figure 26

Radar profile showing the difference in shape between the reflected hyperbolas of graves (A) and airwaves that result from overhanging branches (B)
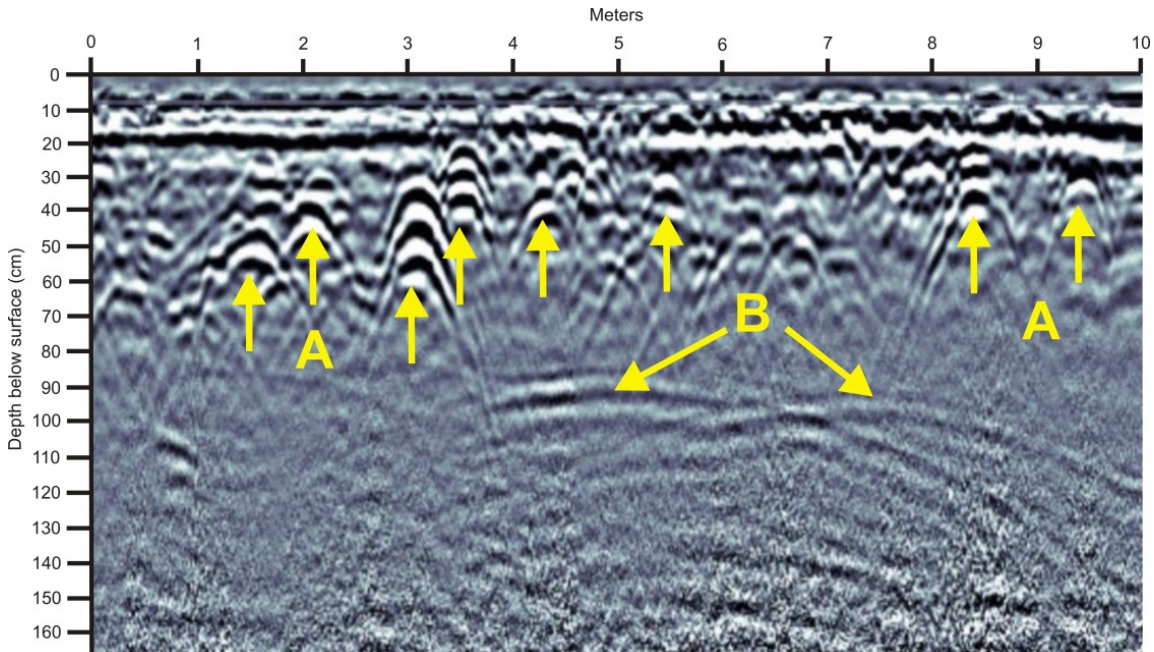
The results of the GPR survey, when viewed in plan, indicate that there are approximately 100 grave shafts in the survey area. Seventeen of these appear to be associated with headstones, while the others are unmarked (Figure 27). The total of 100 shafts is an estimate, based on the average grave shaft measuring approximately one meter wide by two meters long. Although some of the graves are quite well defined, particularly in the 20-30 cm amplitude time slice, they become more difficult to identify as the reflections become more attenuated as we investigate deeper into the ground. Furthermore, there are reflections from numerous tree roots adding a considerable amount of noise in the data, making identification of individual graves difficult. Our estimate is, therefore, based on observing trends in the data, where we identify broad lines of high amplitude reflections. These trends are divided into 1 m by 2 m units to give us approximately 100 identified graves shafts in the survey area. This should be treated as a minimum number, as many graves are

likely smaller than 1 m by 2 m, particularly those of children. The number of grave shafts also should not be taken to reflect the number of interments, as multiple burials may be stacked on top of each other in the same grave shaft or in coffins tightly packed next to each other in an open trench, thereby taking up less space (see Figures 6 and 7). This is particularly true for a potter's field where we might anticipate mass burial events and a closer examination of our profile data indicates that this is the case for the Woodland Cemetery.

Figure 27

Map showing the distribution of unmarked graves in the Potter's Field based on the GPR results
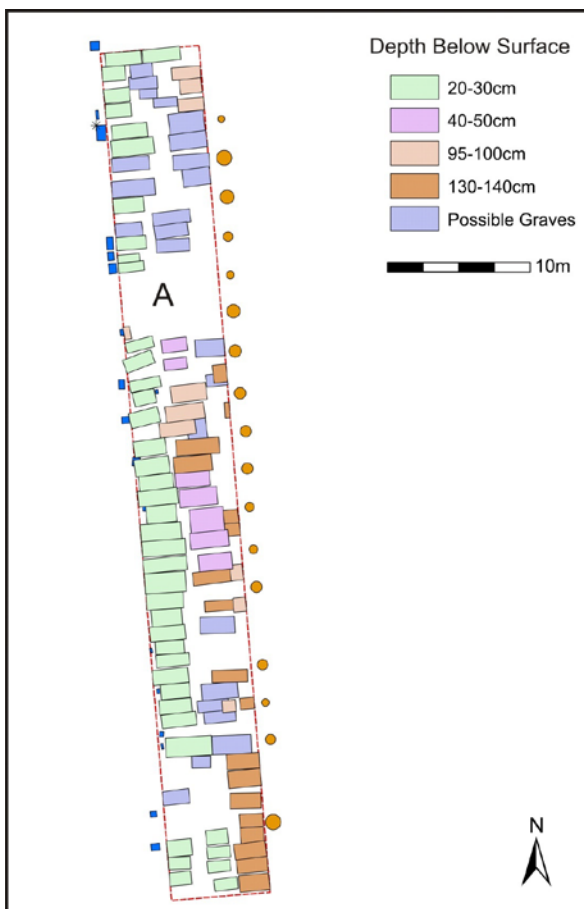
*Note.* The letter A indicates an area with no burials.

Figure 28 illustrates some target reflections identified in our profile data, which include the two principal types of radar reflections: the hyperbola (Figure 28A) and the planar reflection (Figure 28B). Hyperbolas result when a radar wave crosses a small buried target, known as a point source, such as a rock, or a linear target, such as a pipe or tree root crossed at right angles. The location of the target is at the apex of the hyperbola and the "A" shape of the reflection is a result of the conical nature of the radar wave as it propagates through the ground (see Conyers, 2013:59 for a detailed description of hyperbola generation). The planar reflection is created when a radar wave encounters a buried horizontal boundary, such as an interface between two geological layers or the flat surface such as a buried floor or coffin lid. The width of the reflections will provide some indication of the relative width of the buried feature, although depth, orientation of target to antenna, and relative dialectic permittivity of the soil also influence the reflections' shape and size.

While we would generally anticipate burials to generate planar reflections, the complex nature of buried deposits and features often results in more variable, complex reflections. This is apparent in our survey data, where we see reflections from burials that present the combined characteristics of both hyperbolas and planar reflections (Figure 28C-F). This variability can potentially be accounted for by different states of coffin preservation and/or differences in the type of interments present. As coffins decompose, the flat lid, which we would anticipate would present a planar reflection, disintegrates to produce multiple smaller planar or hyperbolic reflections. Alternatively, radar reflections may vary depending on the type of interment present. For example, some burials may have been placed in coffins of varying quality (wood type, metal lined, presence/absence of metal handles, etc.), or without coffins at all. Finally, coffins that are stacked or placed side by side in a single grave cut will produce very different radar responses. In instances where the graves are distributed very close together, such as the potter's field (see Figures 7 and

8), the resulting multiple, overlapping reflections make it very difficult to distinguish individual graves and leave us to best estimate the number of burials present (Figure 28G).

Figure 28

Examples of some of the radar reflections identified in the GPR survey
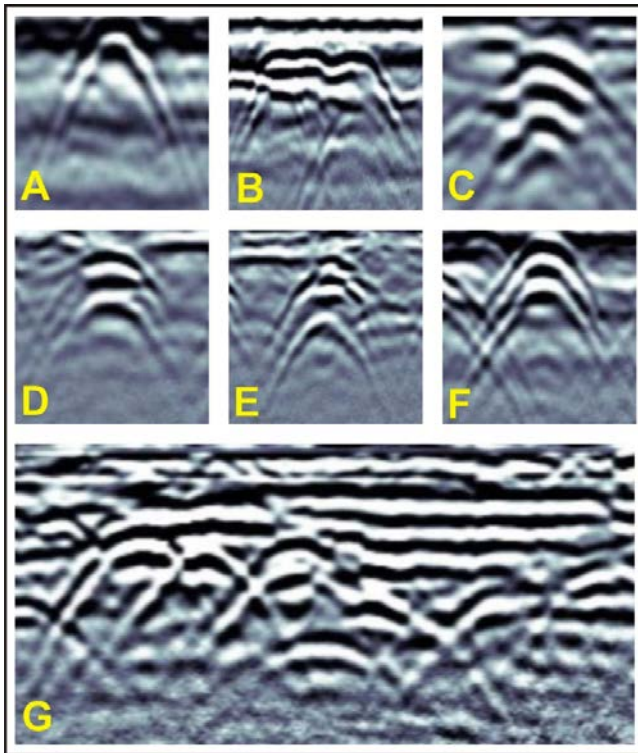
Note. A – a typical hyperbola; B – a planar reflection; C to F – combinations of hyperbolas and planar reflections; G – multiple overlapping reflections. See text for discussion.

Despite these difficulties, it is clear that the pattern of burial in the potter's field was not uniform across the area. The profiles from the northern end of the site indicate that the layout of the graves was relatively orderly, as their reflections are spaced apart and easily distinguishable from each other (Figure 29A). Two of the reflections are slightly more complex, presenting as two hyperbolas stacked on top of each other (Figure 29B). While the presence of stacked coffins within a single grave shaft is a possibility, air voids within a single coffin that result in separate reflections

for the lid and base of the casket would produce a similar response. In most instances the individuals in this area appear to have been buried on separate occasions in their own grave.

A profile from the central section of the survey area, however, shows a very different picture. Here, the radar response shows a thick, planar reflection (Figure 29C) intersected with numerous hyperbolic reflections. The interruption on the stratigraphic profile in conjunction with the strong planar reflection suggests that this might be the result of a mass burial with tightly packed, disintegrating coffins within a single trench (see Figures 7 and 8). Numerous hyperbolic reflections either side of the trench (Figure 29D) indicate that additional single inhumations are also in the area and a single planar reflection immediately below the surface (Figure 29E) is likely a buried headstone. This suggestion could be tested by probing the soil. The central profile also provides evidence that some areas of the potter's field were likely reused, as we see a series of small, planar reflections deeper in the profile (Figure 29F and H), indicating an earlier, less tightly packed arrangement of burials.

Other parts of the survey area are even more complex with profiles showing significant ground disturbance from numerous intersecting cuts (Figure 29G), from what we assume to be a series of mass burial events. In these instances, it is impossible to distinguish individual burials apart from the occasional isolated reflection (Figure 29H) indicating earlier, more deeply buried graves.

Figure 29

Radar profiles illustrating variable reflections from different types of burial
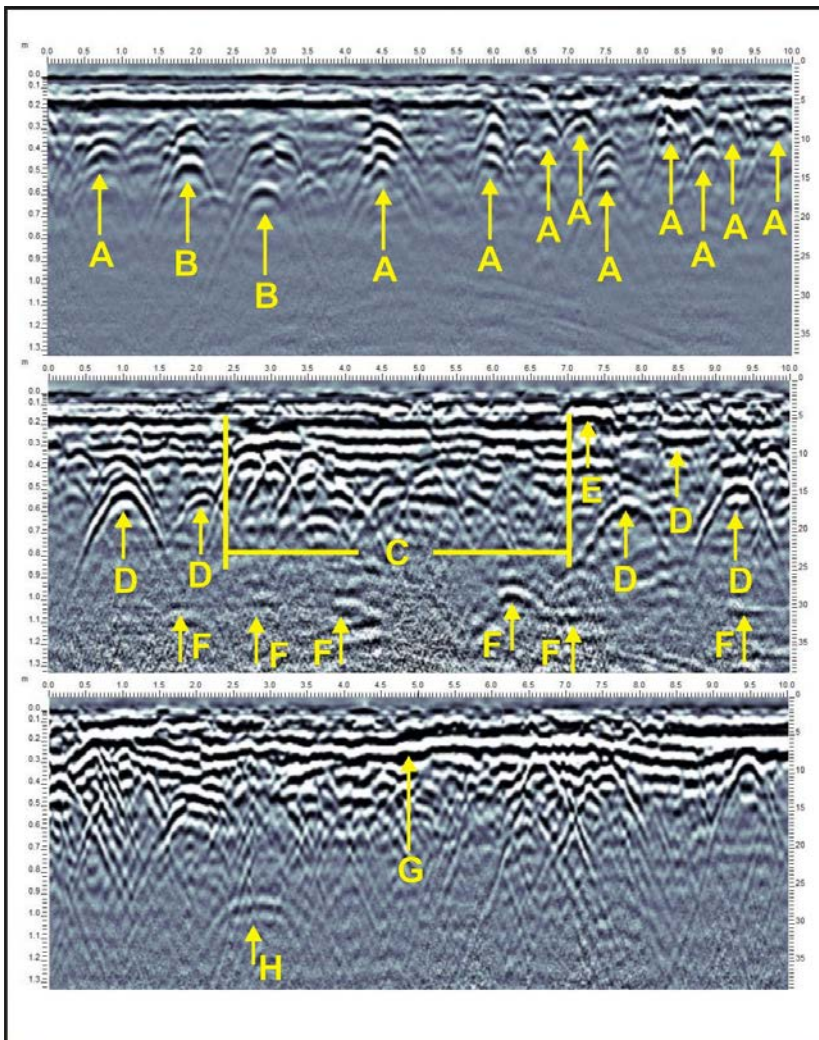
Note. A – well spaced orderly graves; B – a stack of hyperbolas; C – a thick planar reflection intersected by numerous hyperbolas; D – numerous hyperbolic reflections; E – possible buried grave marker; F and H – deep small planar reflections; G – numerous intersecting cuts.

Available photographs suggest that typical potter's field burials accord to the mass burial model. The photos reproduced here in Section 4 (Figures 7 and 8) of burials at New York's Hart Island show the linear trench cuts as well as stacking of coffins. Historic photos, such as the Jacob Riis photo from the 1890s of Hart Island show that this pattern has a long history. A combination

of these two practices, along with some individual grave shafts, likely explains the variability in our data.

The GPR results indicate that almost the entire area of the potter's field is taken up with interments, except for a five-meter section towards the northern end of the survey area. This area corresponds to a gap between two plot sections in Area C (Figure 31) and suggests that burials in the potter's field might have initially followed the layout of the cemetery to some degree. However, in most instances these gaps were filled, suggesting that space in the potter's field was under high demand. This is supported by the profile data, where we see evidence of tightly packed mass graves and areas that have at least two phases of burial.

Figure 31

Map of the graves identified in the GPR survey in relation to the Woodland Cemetery plots
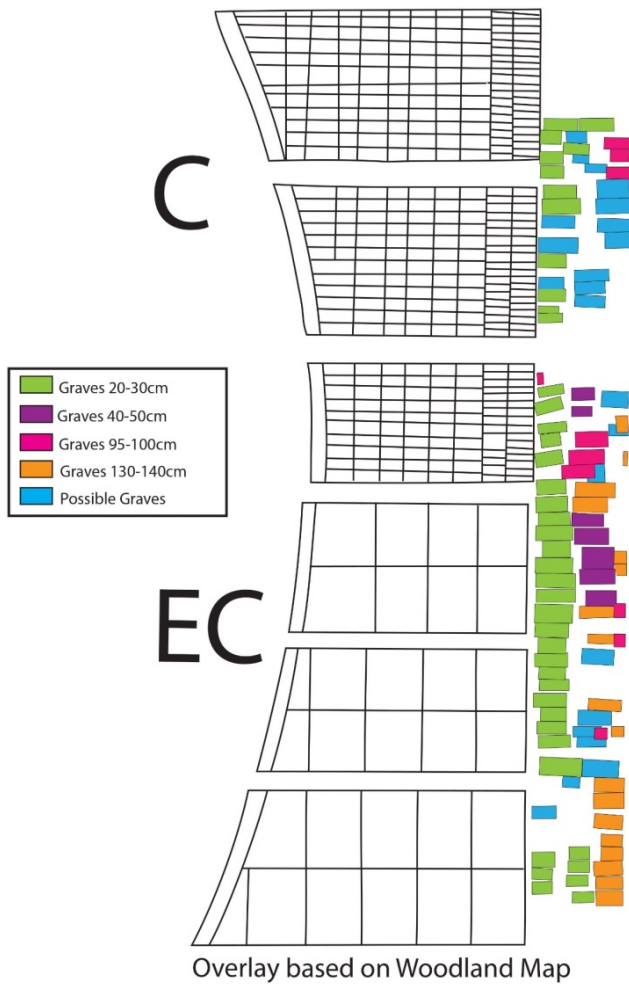
Note. The gap in burials that corresponds to a gap between the lower and middle sections of Area C.

The GPR results also show a trend of increasing depth of graves from west to east, with the western most of the graves identified at 20-30 cm below surface, the eastern most graves mostly visible at 130-140 cm and the central graves at the depths between the two. Why the graves are buried at different depths from west to east remains unclear. As cemeteries are often landscaped, we anticipated that the different depths might be accounted for by the addition of topsoil on the

eastern margins of the cemetery to flatten the sloping topography, after the eastern interments had been buried. This would make the graves appear deeper in the ground. To test this, we ran three GPR transects from east to west over our survey area (see Figure 13 for the location of the transects) to see if any additional layers of soil could be identified. The results (Figure 32) indicate that, while we do see between 5-15 cm of additional topsoil on the eastern edge of the survey area, suggesting some degree of landscaping, it does not fully account for the 100-cm difference in depth between the western and eastern graves. It is possible, therefore, that the different depths are also be due to temporal variation.

Figure 32

Three profiles recorded across the survey area from west to east showing a slight increase in depth of topsoil on the eastern edge of the potter's field
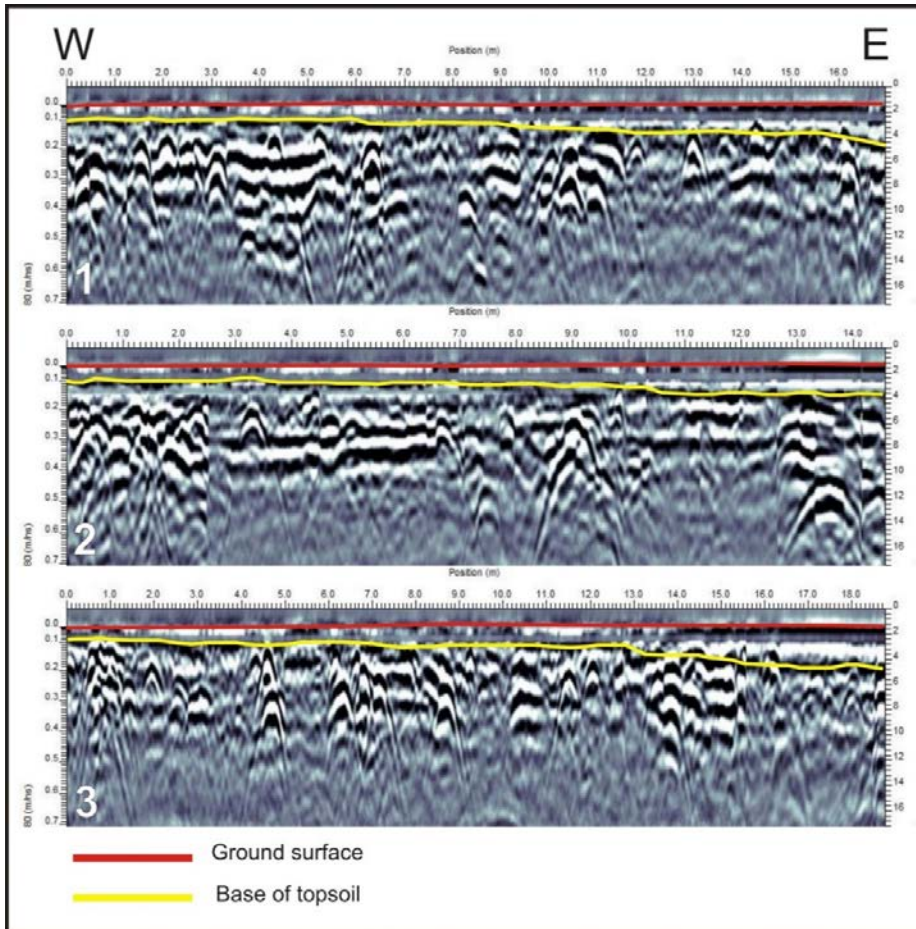
Note. The red line indicates the ground surface and the yellow line indicates the base of the topsoil. All three profiles, though particularly 1 and 3, show an increase in the topsoil depth as you move eastward. See Figure 13 for the location of the transects.

7.5.2 Magnetic Susceptibility Results

The magnetic Susceptibility (MS) survey, while collected at a lower sample density than the GPR survey, was also informative (Figure 33). The results show a line of high susceptibility values running along the western edge of the survey area that corresponds to the line of superficial graves identified in the GPR survey (Figure 34). This was an exciting result, as it highlights the

potential of this novel approach for the identification of grave shafts. Although the magnetic susceptibility results were not as clear as our GPR survey, there are many scenarios where GPR survey is not applicable, for example, areas with numerous buried natural targets, such as large glacial erratics, that create too much noise for grave detection. In these instances, MS survey may be more suitable as it is less affected by buried targets.

The magnetic susceptibility survey did not, however, identify the central or eastern lines of graves. This is significant as, in theory, had all the graves been cut from the current ground level, we would anticipate that all the grave lines would be identifiable. These apparently "missing graves" are most likely accounted for by the addition of topsoil on the eastern edge of the cemetery, as identified in the East-West GPR transects (Figure 32). Although only 5-15 cm of additional soil appears to have been added, it is enough to influence the readings, as our magnetic susceptibility meter only records susceptibility readings within the top 10 cm of soil. The addition of the soil would mask the differences between the fill of the grave shaft and the surrounding soil and would also explain the decreasing MS values from west to east if there is a layer of fill on the east side of the field as suggested here.

Figure 32

Results of the magnetic susceptibility survey
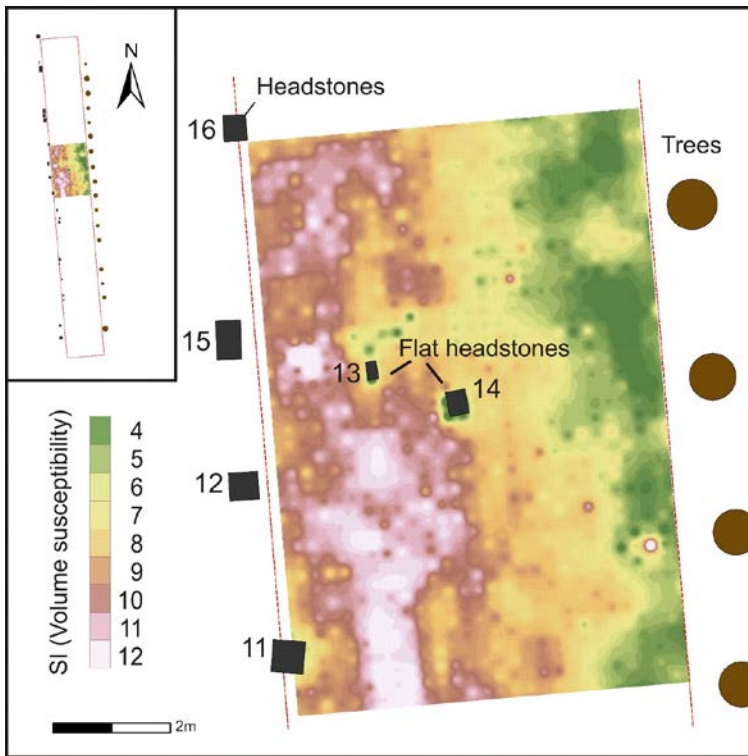
Figure 33

Results of the magnetic susceptibility survey (A) in Grid 3 compared to those from the GPR survey (B and C)
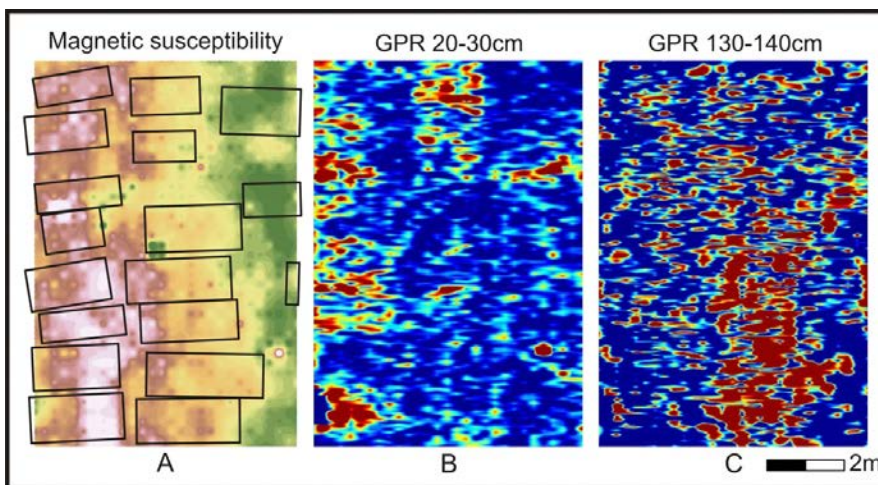
Note. The magnetic susceptibility plot is overlaid with the likely position of graves identified in the GPR survey.

7.5.3 Summary of Results

The results of our ground penetrating radar and magnetic susceptibility surveys of the potter's field at Woodland Cemetery highlight the strength of geophysical techniques for the identification and mapping of unmarked graves. Both techniques were successful in identifying graves, with the GPR being the most informative. The GPR survey identified a minimum of 100 grave shafts in this part of the potter's field, distributed as three tightly packed lines, running north-south through the survey area (Figure 35). While the horizontal distribution of the graves appears to follow the general layout of the cemetery to some degree, the results show that space in the potter's field was at a premium with many areas consisting of sections of tightly packed mass burials and evidence of reuse. These results indicate that there is significant variability in the types of burial present in the potter's field, with burials ranging from single interments, each in an individual grave shaft, to multiple interments in an open trench. We only identified one likely buried headstone in the survey area (Figure 29E above), indicating that the graves would have had simpler, perhaps wooden, markers or no markers at all. The magnetometer survey was also fruitful, demonstrating that the approach has merit in circumstances where other techniques are unsuitable. However, the relatively slow speed (approximately 3 times slower than the GPR), low resolution of the approach, and its shallow detection limits, compared to GPR, would suggest that it will not become a primary tool for grave detection.

Figure 35

Final map of the graves identified in the GPR survey in relation to standing headstones
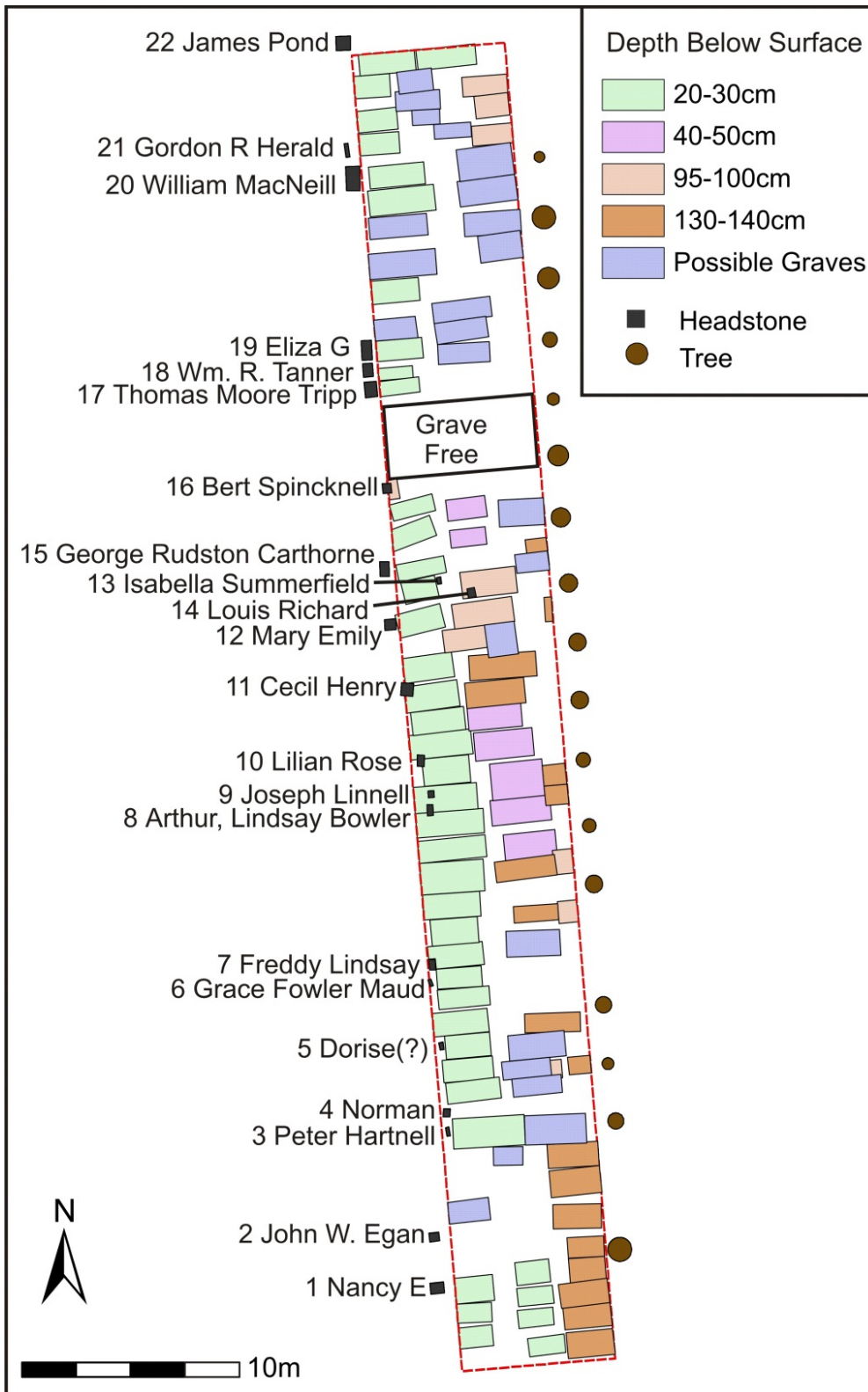
8. Conclusions and Future Research

In this report, we have explored the historical and social contexts of potter's fields through time and space and have attempted to place potter's fields in general, and the potter's field at Woodland Cemetery in London, Ontario, in particular, within a broad anthropological comparative context. In keeping with potter's fields elsewhere, the historical documents we were able to consult indicate that the individuals who were interred in this area of the cemetery were individuals without means, or from underprivileged and marginalized groups. Mortuary practices in late 19th century London, Ontario reflected the larger context of the Victorian era, and in the case of the potter's fields, the efforts of the Church to ensure that the poor in its flock was afforded at least the minimal aspects of burial. At the same time, secularization and consumerism were on the rise, and class was being overtly signaled in all aspects of society, including the cemetery. The movements of cemeteries away from civic centres reflected, among other things, a concern with epidemic diseases that were rampant at the time, particularly cholera (Brash et al. 2019), and the treatment of the individuals from the potter's fields (poor recordkeeping, lack of markers) during those moves reflected the larger social divide between the rich and the poor.

The key goal of this exercise from the perspective of Woodland Cemetery, was to gain a better understanding of the distribution and typology of graves within the area of their potter's field. Remote sensing analyses indicated the presence of a minimum of 100 burial cuts in the region of the potter's field that was surveyed, with a mix of interment types ranging from individual grave cuts to probable mass deposits. Complexities of the interpretation of complex ground penetrating radar signals, likely due to stacked caskets and taphonomic changes over the course of 140 years and the possible introduction of landscaping fill, has complicated our analysis, and the actual number of burials is quite likely much higher than that. Suffice to say, 100+ burials

within a 600 m^2 survey area indicates that the pattern(s) of burial in this area differed significantly from the typical Victorian distribution of plots in a cemetery.

That dense distribution of burials supports the devaluation of the individuals suggested by the historical record. Our ground penetrating radar and magnetic susceptibility readings also indicated these plots were overlapping and vary significantly in depth, potentially indicating multiple interments in single plots. The strong linear patterning suggests a similar pattern seen today in the Hart Island burials (see Figures 7 and 8). Using this information, we can begin to compare the Woodland cemetery potter's field to other potter's fields in North America and abroad. This information will also provide important guidance for Woodland Cemetery to use in decisions about land use and preservation.

Going forward, there are several additional areas where research can be conducted at the Woodland Cemetery potter's field. The first area we would address would be to finish the remote sensing surveys as we were only able to complete 600 m^2 of the survey area with the ground penetrating radar, and only 100 m^2 with the magnetic susceptibility unit. Fillmore & Sayers (2020) suggest that the potter's field is 850 m^2 in size. Second, we also think it would be informative to do some sampling of the soil for chemical analysis. This can be done by obtaining core samples in specific areas. With the ground penetrating radar data, it would be possible to get these samples with minimal intrusion to the remains. The chemical analysis would allow us to gauge the pH changes due to both decomposition and plant activity. Additionally, we may be able to detect chemicals used in embalming (e.g. As, Hg) during the time that the potter's field was in use, possibly informing the Cemetery of soil toxicity (the likelihood is low).

The magnetic susceptibility returned some promising results. It would be beneficial to conduct a full survey using the magnetic susceptibility equipment. It is rarely used in the grave

prospection context, and even more rarely at the level of resolution we used. This research would be an important contribution to the remote sensing, grave prospection literature.

Finally, while we will never be able to fully identify individual remains or associate names with particular burial cuts, there are steps that can be taken to collect some of the identities to the people laid to rest in the potter's field. This is an effort that was initiated with the Hord/Abaza project (Abaza, 2018; Appendix 2). St. Paul's Cemetery records are available in the London Room of the London Public Library (St. Paul's Cemetery, 1988). Additional records are available in the archives of the Huron diocese (Woodland Cemetery, (n.d.(b)). A next step would be to create a plaque or other form of memorial to recognize those that were placed in the potter's field at Woodland Cemetery. While this cannot repair the negative effects of social death and marginalization these individuals experienced both in life and after their deaths, it could bring them recognition and, in a way, bring them back into society.

10. References

Abaza, L. (2018). *Lost and found. Untold stories from Woodland's "potter's fields".*
Unpublished walking tour brochure. Woodland Cemetery: London, ON.
(see Appendix 2)

Abernathy, C., & Ohanian, E. (1992). Non-carcinogenic effects of inorganic arsenic.
Environmental Geochemistry and Health, *14*(2), 35–41.
https://doi.org/10.1007/BF01783626

Amuno, S. A. (2013). Potential ecological risk of heavy metal distribution in cemetery soils.
Water, air, & soil pollution, *224*(2), 1435.

Armstrong, M. D., & Csathy, T. I. (1962). *Frost design practice in Canada*. Committee on frost
heave and frost action in soils.

Archaeologix Inc. (AI) (2007). *Archaeological assessment (Stage 4), Wesleyan-Methodist
Cemetery, City of London, Middlesex County, Ontario*. Archaeological report on file with
the Ministry of Tourism Culture and Sport, Toronto.

Augusto, L., Dupouey, J-L., & Ranger, J. (2003). Effects of tree species on understory vegetation
and environmental condition in temperate forests. *Annals of Forest Science*, *60*(8), 823-
831. https://doi.org/10.1051/forest:2003077

Baker, M. (1997). Invisibility as a symptom of gender categories in archaeology. In E. Scott & J.
Moore (Eds.), *Invisible people and processes: Writing gender and childhood into
European archaeology* (pp. 183–191). Leicester University Press.

Beal, E. (2018, May 11). Funeral homes and funeral practices. *Encyclopedia of Cleveland
history*. Retrieved March 29, 2020 from https://case.edu/ech/articles/f/funeral-homes-
and-funeral-practices

Belshaw, J. (2016). *Canadian history: Post-Confederation*. BC Campus.
https://opentextbc.ca/postconfederation/

Benninger, L. A., Carter, D. O., & Forbes, S. L. (2008). The biochemical alteration of soil
beneath a decomposing carcass. *Forensic Science International*, *180*(2),70 – 75.
https://doi.org/10.1016/j.forsciint.2008.07.001

Bevan, B. (1991). The search for graves. *Geophysics* 56(1), 310-319.

Bible. King James Version, Gospel of Matthew, Chapter twenty-seven, verses three to eight.

Binford, L. R. (1962). Archaeology as anthropology. *American Antiquity*, *28*(2), 217–225.

Brash, M., Caldwell, H., Campbell, B., Fitzgerald-Black, A., Gustafsson, T., Lambe, L., Larsen,
E., Leitch, D., Luchenski, L., McIlwain, N., Schwindt, J., Sellens, M., & Sollars, M.
(2019). *Life and death at Woodland Cemetery.* Western University.

Brück,, J. (2005). Experiencing the past? The development of a phenomenological archaeology
in British prehistory. *Archaeological Dialogues* 12(1), 45-72.

Byrnes, J. F. (2015). *A pauper's shame: a biocultural investigation of trauma, impairment, and
disability in the Erie County Poorhouse Cemetery, 1851-1913* (Publication No. 3683011)
[Doctoral Dissertation, Department of Physical Anthropology at State University of New
York at Buffalo]. Proquest Dissertation Publishing. https://search-proquest-
com.proxy1.lib.uwo.ca/docview/1658216697?pq-origsite=primo

Cadotte, M., & James-abra, E. (2013, June 19). Epidemics in Canada. *The Canadian
encyclopedia.* Retrieved March 29, 2020 from
https://www.thecanadianencyclopedia.ca/en/article/epidemic

CBC News. (2018, July 1). Take a tour of London's potter's field in city cemetery. *CBC news*
https://www.cbc.ca/news/canada/london/cemetery-potter-s-field-woodland-1.4722243

Cheater, M. (2018, July 6). Unearthing the forgotten. *Western News*.

    https://news.westernu.ca/2018/07/lost-found-untold-stories-woodlands-potters-fields/

City of London (2005). *By-law No. L.S.P.-3373-297*. Heritage designation by-law on file with

    the City Planning - Urban Regeneration Division of the City of London.

City of London (2020). *History of London – 1946 to 1976*. Retrieved July 10, 2020 from

    http://www.london.ca/About-London/london-history/Pages/1946-to-1976.aspx

City of Owen Sound. (n.d.). *Potter's field*. Retrieved March 29, 2020 from

    https://www.owensound.ca/en/exploring/potters_field.aspx#

Clark, A. (1990). *Seeing beneath the soil. Prospecting methods in archaeology*. Batsford Press.

Clark, M. A., Worrell, M. B., & Pless, J. E. (1997). Postmortem changes in soft tissues. In Haglund,

    W. D., & Sorg, M. H. (Eds.), *Forensic taphonomy: the postmortem fate of human remains*

    (pp. 151-164). CRC Press.

Cockle, D. (2013). *Human decomposition and the factors that affect it: A retrospective study of*

    death scenes in Canada (Publication No. NS23855) [Doctoral dissertation, Department of

    Archaeology at Simon Frasier University]. ProQuest Dissertations Publishing.

    http://search.proquest.com/docview/1519398618/

Colls, C. (2016). 'Earth conceal not my blood': forensic and archaeological approaches to

    locating the remains of Holocaust victims. In J. Dreyfus, & E. Anstett (Eds.) *Human*

    remains in society: curation and exhibition in the aftermath of genocide and mass-

    violence (pp. 163-196). Manchester University Press.

Conkey, M.W. & Gero, J.M. (1997). Program to practice: Gender and feminism in archaeology.

    Annual Reviews of Anthropology 26, 411-437.

Conyers, L.B., Ernenwein, E.G. & Bedal, L-A. (2002). Ground-penetrating radar discovery at Petra. *Antiquity* 76,339-340.

Conyers. L. B. (2006a). Ground penetrating radar. In J.A. Johnson (eds), *Remote sensing in archaeology: An explicitly North American approach.* (pp. 131-159). University of Alabama Press.

Conyers, L. B. (2006b). Ground-penetrating radar techniques to discover and map historic graves. *Historical Archaeology*, 40(3), 64-73. https://doi-org.proxy1.lib.uwo.ca/10.1007/BF03376733

Conyers L. B. (2013). *Ground penetrating radar for archaeology*. 3rd edition (first published 2004). AltaMira.

Conyers, L. B. & Goodman, D. (1997). *Ground-penetrating radar: an introduction for archaeologists*. AltaMira.

Cook, R. A. & Burks J. (2010). Determining site size and structure: A Fort Ancient example. *American Antiquity* 76:145–162.

Cook, M., Gibbs, L. & Spence, M.W. (1985). Age and sex identification in the Stirrup Court Cemetery. *Kewa* 85(4), 3-19.

County of Santa Clara. (2013, June 13). *Potter's field excavation and artifacts*. Retrieved March 29, 2020 from https://www.sccgov.org/sites/opa/nr/Pages/Potter'sField.aspx

Dajao, R.C.E. (1999). *A cemetery for the City of New York*. [MA Thesis, Department of Architecture at the Massachusetts Institute of Technology]. https://dspace.mit.edu/handle/1721.1/28317.

Dalan, R. A., De Vore, S. L., & Clay, R. B. (2010). Geophysical identification of unmarked historic graves. *Geoarchaeology*, 25(5), 572-601. https://doi-org.proxy1.lib.uwo.ca/10.1002/gea.20325

David A., Linford N., Linford P., Martin L., & Payne A. (2008). *Geophysical survey in archaeological field evaluation*. English Heritage.

Davis, S. (2015, April 6). PostMortem: This is what happens to unclaimed bodies in Washington, DC. *Vice*. Retrieved March 29, 2020 from https://www.vice.com/en_ca/article/9bze43/this-is-what-happens-to-unclaimed-bodies-in-washington-dc-406

De Spiegeleer, C. (2017). Introduction: Secularization, anticlericalism, and funerary culture in late modern Europe. *Revue belge de Philologie et d'Histoire*, *95*(4), 833-847. https://www.persee.fr/doc/rbph_0035-0818_2017_num_95_4_9094

De Spiegeleer, C., & Tyssens, J. (2017). Secularizing funerary culture in nineteenth-century Belgium: A product of political and religious controversy. *Death Studies*, *41*(1), 14-21. https://doi-org.proxy1.lib.uwo.ca/10.1080/07481187.2016.1257878

Dent, B. B., Forbes, S. L., & Stuart, B. H. (2004). Review of human decomposition processes in soil. *Environmental Geology*, *45*(4), 576-585. https://doi-org.proxy1.lib.uwo.ca/10.1007/s00254-003-0913-z

Department of Planning and Development. (1952). *Upper Thames Valley conservation report 1952*. https://thamesriver.on.ca/wp-content/uploads//Publications/52Report-PartI-Land-chA-ch9.pdf , Government of Ontario.

Dick, H. C., Pringle, J.K., Wisniewski, K.D., Goodwin, J., van der Putten, R., Evans, G.T., Francis, J.D., Cassella, J.P., & Hansen J.D. (2017). Determining geophysical responses from burials in graveyards and cemeteries. *Geophysics* 82(6), 245-255.

Dionne, C. A., Wardlaw, D.K., & Schultz J.J. (2010). Delineation and resolution of cemetery graves. *Technical Briefs in Historical Archaeology* 5, 20-30

Efremov, J.A. (1940). Taphonomy: A new branch of paleontology. *Pan-American Geologist* 74(2), 81–93.

Ellwood, B.B. (1990). Electrical resistivity surveys in two historical cemeteries in Northeast Texas: A method for delineating unidentified burial shafts. *Historical Archaeology* 24, 91–98.

Farncomb, Kirkpatrick & Stirling (1993). *Compiled plan showing all of Woodland Cemetery in the City of London, County of Middlesex*. Farncomb, Kirkpatrick & Stirling Surveying Ltd.: London Ontario. Map on file with the Department of Anthropology, Western University, London, ON, Canada.

Feagin, J. R. (1972). Poverty: We still believe that God helps those who help themselves. *Psychology Today, 6*(6), 101-110.

Feather, N. T. (1974). Explanations of poverty in Australian and American samples: The person, society, or fate? *Australian Journal of Psychology, 26*(3), 199-216.

Fiedler, S., & Graw, M. (2003). Decomposition of buried corpses, with special reference to the formation of adipocere. *Naturwissenschaften, 90*(7), 291–300.

Fiedler, S., Illich, B., Berger, J., & Graw, M. (2009). The effectiveness of ground-penetrating radar surveys in the location of unmarked burial sites in modern cemeteries. *Journal of Applied Geophysics 68*(3), 380–385.

Field, C. D. (2017). *Secularization in the long 1960s: Numerating religion in Britain*. Oxford University Press.

Fillmore, M. & Sayers, T. (2020). *The Potter's Field* [In-class Power Point presentation, January 20, 2020]. Woodland Cemetery, London, ON.

Fisher, M. (2014). Unearthing buried mysteries with ground-penetrating radar. *CSA NEWS, 59*(1). https://doi.org/10.2134/csa2014-59-1-1.

Forbes, S. (2008). Decomposition chemistry in a burial environment. In D. O. Carter & M. Tibbet (Eds.), *Soil analysis in forensic taphonomy: Chemical and biological effects of buried human remains,* (pp. 203-223). CRC Press.

Forbes, S.L., Stuart, B.H., & Dent, B.B. (2005). The effect of the method of burial on adipocere formation. *Forensic Science International, 154*(1), 44-52. https://doi.org/10.1016/j.forsciint.2004.09.109.

Gaffney, C., & Gater, J. (2003). *Revealing the buried past: Geophysics for archaeologists.* Tempus Publishing.

Gaffney, C., Harris, C., Pope-Carter, F., Bonsall, J., Fry, R., & Parkyn, A. (2015). Still searching for graves: an analytical strategy for interpreting geophysical data used in the search for "unmarked" graves. *Near surface geophysics*, *13*(6), 557-569. https://doi.org/10.3997/1873-0604.2015029.

Gans, H. J. (1995). *The war against the poor: The underclass and antipoverty policy.* Basic Books.

Graydon, A.O. (1884). *Map of The City of London and suburbs of London East, London West and London South (indicating postal districts, letter boxes, fire alarm boxes, wards, and classified business directory).* Joseph Doust: Toronto. Weldon Library Archives and Special Collections, catalogue number CXX9.

Gijbels, J. (2018). Reassessing the pauper burial: The disposal of corpses in nineteenth-century Brussels. *Mortality*, *23*(2), 184-198. https://doi.org/10.1080/13576275.2017.1310093.

Gill-King, H. (1997). Chemical and ultrastructural aspects of decomposition. In W. D. Haglund & M. H. Sorg (Eds.), *Forensic taphonomy: The postmortem fate of human remains*, (pp. 93-108). CRC Press.

Government of Ontario. (1880). Chapter 80. *Statutes of the Province of Ontario passed in the session held in the forty first year of the reign of her Majesty Queen Victoria being the third session of the third Parliament of Ontario.* Queen's Printer of Ontario.

Grauer, A. L., Murray, E. A., & Perzigian, A. J. (1995). A glimpse of early nineteenth century Cincinnati as viewed from potter's field: An exercise in problem solving. In A. L. Grauer (Ed.), *Bodies of evidence: Reconstructing history through skeletal analysis* (pp. 173–184). Wiley-Liss.

Griffin, M. C., Wilczak, C. A., & Bartelink, E. J. (2012). *Proposal for long term study of the human skeletal remains recovered from the Santa Clara Valley Medical Center potter's field.* [Research proposal, Department of Anthropology, San Francisco State University]. http://online.sfsu.edu/mgriffin/Curation%20and%20Research%20Proposal%20%20Final.pdf

Gross, B., & Ridenour, A. (2017). Death and Christianity. *Christian bioethics*, *23*(1), 1-6. https://doi-org.proxy1.lib.uwo.ca/10.1093/cb/cbw023.

Hall, R., & Bowden, B. (1986). Beautifying the boneyard: The changing image of the cemetery in nineteenth-century Ontario. *Material Culture Review, 23*, 13-24.

Hart Island Project (2020). *The Hart Island project*. https://www.hartisland.net/ Accessed June 29, 2020.

Heller, E. (1987). *Unmarked Cemeteries in the City of London: A Preliminary Report*. Ministry of Culture and Recreation, Southwestern Archaeological Field Office. London, Ontario.

Hirschfeld, L. A. (2002). Why don't anthropologists like children? *American Anthropologist*, *104*(2), 611–627. https://doi.org/10.1525/aa.2002.104.2.611

Hodder, I. (1985). Postprocessual archaeology. *Advances in Archaeological Method and Theory*, *8*, 1–26. https://doi.org/10.1016/B978-0-12-003108-5.50006-3

Hodgetts, L., Millaire, J-F, Eastaugh, E. & Chapdelaine, C. (2016). The untapped potential of magnetic survey in the identification of precontact archaeological sites in wooded areas. *Advances in archaeological practice* 4(1), pp. 41–54.

Hollender, M.H. & Nashville, M.D. (1972). Conversion hysteria. A post-Freudian reinterpretation of 19th century psychosocial data. *Archives of general psychiatry*, 26, 311-314.

Janaway, R. (2008). The decomposition of materials associated with buried cadavers. In D. O. Carter & M. Tibbet (Eds.), *Soil analysis in forensic taphonomy: Chemical and biological effects of buried human remains,* (pp. 153-201). CRC Press.

Jones, G. (2008). Geophysical mapping of historic cemeteries. *Historical archaeology* 3, 25-38.

Johnson, J. K. (2006). Introduction. In J.K. Johnson (eds) *Remote sensing in archaeology: An explicitly North American perspective*, (pp. 1-16). The University of Alabama Press.

Kainz, J., & Cotter, J. P. (2018). A broad band magnetic susceptibility test study—The magnetic spectroscopy of a Neolithic ditch. *Journal of Archaeological Science: Reports*, *18*, 139-150. https://doi.org/10.1016/j.jasrep.2018.01.006.

Kamp, K. A. (2001). Where have all the children gone?: The archaeology of childhood. *The Journal of Psychohistory*, *8*(1), 1–34. https://doi.org/10.1023/A:1009562531188

Keaton, M.A. (2012). *Effect of embalming on the decomposition of pigs.* [Master's thesis, Department of Geography and Anthropology at Louisiana State University and Agricultural and Mechanical College] https://digitalcommons.lsu.edu/gradschool_theses/3350.

Knowles, F., & Benson, A. (1983). The biochemistry of arsenic. *Trends in Biochemical Sciences*, *8*(5), 178–180. https://doi.org/10.1016/0968-0004(83)90168-8.

Konefes, J. L., & McGee, M. K. (2001). Old cemeteries, arsenic and health safety. In D. A. Poirer & K. L. Feder (Eds.), *Dangerous places: health, safety, and archaeology*, (pp. 127-135). Praeger.

Králová, J. (2015). What is social death? *Contemporary Social Science*, *10*(3), 235-248. https://doi.org/10.1080/21582041.2015.1114407.

Krasnick, C.L. (1981). *Insanity as a reflection of morality and social values in nineteenth century Canada: The London, Ontario Asylum for the Insane, 1870-1902*. [Master's thesis, Faculty of Graduate Studies, University of Western Ontario].

Krummel, J. A. (2013). *Holt Cemetery: An anthropological analysis of an urban potter's field*. (Publication No. 1522757). [Master's thesis, Department of Anthropology, Tulane University]. http://search.proquest.com.proxy1.lib.uwo.ca/docview/1371637273?accountid=15115.

Kvamme, K.L. (2003). Geophysical survey as landscape archaeology. *American Antiquity* 68(3), 435-458.

Lawson, S. (1991). Pair quits committee in protest. *London Free Press,* Saturday, May 11, 1991: D1-D2.

Lazzarato, M. (2002). From biopower to biopolitics. *Pli: The Warwick Journal of Philosophy*, *13*, 99-113.

Lee, R. B., & Devore, I. (1968). *Man the hunter*. Aldine.

Linford, N., Linford, P., & Platzman, E. (2005). Dating environmental change using magnetic bacteria in archaeological soils from the upper Thames Valley, UK. *Journal of Archaeological Science, 32*(7), 1037-1043. https://doi.org/10.1016/j.jas.2005.01.017

Lewis, M. (2006). *The bioarchaeology of children: Perspectives from biological and forensic anthropology*. Cambridge University Press. https://doi-org.proxy1.lib.uwo.ca/10.1017/CBO9780511542473

Lyman, R. (1994). *Vertebrate taphonomy*. Cambridge Manuals in Archaeology. Cambridge University Press.

MacLean, V. M., & Williams, J. E. (2009). Cemeteries, unmarked graves, and potter's field. In C. D. Bryant & D. L. Peck (Eds.), *Encyclopedia of death and the human experience* (pp. 179–180). SAGE Publications, Inc. doi: 10.4135/9781412972031.n58

Maher, B. A. & Taylor R.M. (1988). Formation of ultrafine-grained magnetite in soils. *Nature* 336:368–371.

Martin D.L., Harrod R.P., Pérez V.R. (2013a). Bioarchaeology of individuals: identity, social theory, and skeletal analysis. In D. L. Martin, R. P. Harrod, & V. R. Perez (Eds.), *Bioarchaeology: An integrated approach to working with human remains*, (pp. 151-172). Springer.

Martin, D. L., Harrod, R. P., & Pérez, V. R. (2013b). The mortuary component and human remains. In D. L. Martin, R. P. Harrod, & V. R. Perez (Eds.), *Bioarchaeology: An integrated approach to working with human remains* (pp. 117–150). Springer.

Matias, H., Monteiro Santos, F.A., Rodrigues Ferreira, F.E., Machado, C. & Luzio, R. (2006). Detection of graves using the micro-resistivity method. *Annals of Geophysics* 49:1235-1244.

Mayers, A. (2007, October 8). No secret where bodies are buried. *The Star*. Retrieved March 29, 2020, from

https://www.thestar.com/news/2007/10/08/no_secret_where_bodies_are_buried.html

Mellet, J. (1992). Location of human remains with ground penetrating radar. *Proceedings the Fourth International Conference on Ground Penetrating Radar, Geological Society of Finland, Special Paper 16*, 359-365.

Menken, M.J.J. (2002). The Old Testament quotation in Matthew 27, 9-10: Textual form and context. *Biblica* 83(3), 305-328.

Mitchinson, W. (1982). Gynecological operations on insane women: London, Ontario, 1895-1901. *Journal of social history, 15*(3), 467-484. https://doi-org.proxy1.lib.uwo.ca/10.1353/jsh/15.3.467.

Moen, M. (2019). Gender and archaeology: Where are we now? *Archaeologies* 15, 206-226.

Molto, J. E., & Fox, W. A. (1994). A special child: The Monarch Knoll burial. *Midcontinental Journal of Archaeology*, *19*(1), 99–136.

Morton, R. J., & Lord, W. D. (2002). Detection and recovery of abducted and murdered children: Behavioral and taphonomic influences. In W. D. Haglund and M. H. Sorg (Eds.), *Advances in forensic taphonomy: Method, theory, and archaeological perspectives*, (pp. 151-171). CRC Press.

National Museum of Funeral History. (n.d.). *19th century mourning*. Retrieved March 26, 2020, from https://www.nmfh.org/exhibits/permanent-exhibits/19th-century-mourning .

Nawrocki, S. (1995). Taphonomic processes in historic cemeteries. In A. Grauer (Ed.), *In bodies of evidence: Reconstructing history through skeletal analysis* (pp. 49-66). John Wiley & Sons, Inc.

Neubauer, W.A., Seren, S., Eder-Hinterleitner & Melichar, P. (2002). Georadar in the Roman Civil Town Carnuntum, Austria: An approach for archaeological interpretation of GPR data. *Archaeological Prospection* 9(1), 35-156.

Nobes, D. (1999). Geophysical surveys of burial sites: A case study of the Oaro Urupa Site. *Geophysics* 64(2), 357-367.

Nolan, K. C. & Redmond, B. G. (2015). Geochemical and geophysical prospecting at three multicomponent sites in the Southwestern Lake Erie Basin: A pilot study. *Journal of Archaeological Science: Reports* 2, 94–105.

Norwood, F. (2009). *The maintenance of life: preventing social death through euthanasia talk and end-of-life care: lessons from the Netherlands*. Carolina Academic Press.

Ontario Ministry of Heritage, Sport. Tourism and Culture Industries (OMHSTCI) (2020). *Archaeological assessments*. http://www.mtc.gov.on.ca/en/archaeology/archaeology_assessments.shtml, accessed June 16th, 2020

Organic disease. (n.d.) *Miller-Keane encyclopedia and dictionary of medicine, nursing, and allied health, seventh edition*. (2003). Retrieved March 27th, 2020, from https://medical-dictionary.thefreedictionary.com/organic+disease

Oshawa Community Museum. (2015). *Mourning after: The Victorian celebration of death*. Retrieved March 26th, 2020, from http://www.oshawamuseum.org/pdf/Mourning_After_The_Victorian_Celebration_of_Death.pdf

Pacheco, A., Mendes, J. M. B., Martins, T., Hassuda, S., & Kimmelmann, A. A. (1991). Cemeteries-a potential risk to groundwater. *Water Science and Technology*, *24*(11), 97-104.

Parr, J. (1982). *Childhood and family in Canadian history*. McLelland and Stewart.

Pfeiffer, S., Milne, S., & Stevenson, R. M. (1998). The natural decomposition of adipocere. *Journal of Forensic Science*, *43*(2), 368-370.

Pierce, R. J. (1978). *A description of the juvenile ceramics recovered during the 1975 field season at the Draper Site*. [Museum of Indian Archaeology Research Report No. 3, London, Ontario].

Powell, K. (2004) Detecting buried human remains using near-surface geophysical instruments. *Exploration Geophysics*, *35*(1), 88-92.

Rainey, R. (Aug 28., 2013). Holt Cemetery, six others in New Orleans to undergo $2.8 million in renovations. Retrieved June 28th, 2020, from https://www.nola.com/news/politics/article_0558f990-f7cd-522e-80fd-0599fde02bb4.html.

Rogers, J. (1878). Map of the city of London and suburbs, originally a supplemental map to the *Illustrated Historical Atlas of Middlesex*. Weldon Library Archives and Special Collections, catalogue number CX86.

Rollings-Magnusson, S. (2009). *Heavy burdens on small shoulders: The labour of Canadian children on the Canadian prairies*. University of Alberta Press.

Roos, C. I. & Nolan, K.C. (2012). Phosphates, plowzones, and plazas: A minimally invasive approach to settlement structure of plowed village sites. *Journal of Archaeological Science* 39, 23–32

Rosen, J. (2020, April 29). How Covid-19 has forced us to look at the unthinkable. *The New York Times magazine.* Retrieved on May 27th, 2020 from https://www.nytimes.com/2020/04/29/magazine/covid-hart-island.html

Ruffel, A., McCabe, A., Donnelly, C., & Sloan, B. (2009). Location and assessment of an historic (150–160 years old) mass grave using geographic and ground penetrating radar investigation, NW Ireland. *Journal of Forensic Sciences*, *54*(2), 382-394.

Salsarola, D., Poppa, P., Amadasi, A., Mazzarelli, D., Gibelli, D., Zanotti, E., Porta, D., & Cattaneo, C. (2015) The utility of ground-penetrating radar and its time-dependence in the discovery of clandestine burials. *Forensic Science International, 253*, 119-124.

Santina, A. A. (2001). Toys, models, collectibles: Miniature tipis in the reservation era. In J. M. Szabo & J. J. Brody (Eds.), *Painters, patrons, and identity: Essays in Native American art to Honor J.J. Brody,* (pp. 9-31). University of New Mexico Press.

Savage, H. G., Sullivan, N. C., & Garrad, C. (1990). The child burial from the Melville Site. *Ontario Archaeology*, *50*, 55–61.

Schmidt, A. R., Linford, P., Linford, N., David, A., Gaffney, C. F., Sarris, A., & Faßbinder, J. (2015). *EAC guidelines for the use of geophysics in archaeology: Questions to ask and points to consider.* European Archaeological Council.

Schulz, J. J and M. M. Martin (2011). Controlled GPR grave research: comparison of reflection profiles between 500 and 250 MHz antennae. *Forensic Science International* 209, 64-69

Scollar, I., Tabbagh, A., Hesse, A. & Herzog, I (1990). *Archaeological prospecting and remote sensing*. Cambridge University Press.

Simpson, C. (2011). *The treatment of Halifax's poor house dead during the nineteenth and twentieth centuries*. [Master's thesis, Atlantic Canada Studies, St. Mary's University]. https://www.smu.ca/webfiles/Simpsonburials.pdf

Sitara, G. (2016). Historicizing childhood: The changing fortunes of children and youth in Canada. In Belshaw, J. D. (Ed.) *Canadian history: Post-confederation.* Retrieved April 5, 2020, from https://opentextbc.ca/postconfederation/chapter/10-9-historicizing-childhood-the-changing-fortunes-of-children-and-youth-in-canada/.

Smart, S. (2011). *A better place: death and burial in nineteenth-century Ontario*. Ontario Genealogical Society.

Sofaer Derevenski, J. (1994). Where are the children? Accessing children in the past. *Archaeological review from Cambridge*, *13*, 1-20.

Solla, M., B. Riveiro, Alverez, M. X., & Arias, P. (2012). Experimental forensic scenes for the characterization of ground-penetrating radar wave response. *Forensic science international* 220, 50-58.

Spector, J. (1991). *What this awl means: Feminist archaeology at a Wahpeton Dakota Village*. Minnesota Historical Society Press.

Spongberg, A.L., & Becks, P.M. (2000). Inorganic soil contamination from cemetery leachate. *Water, air, and soil pollution, 117,* 313-327.

St. Paul's Cathedral. (1977). *Selected church records.* London, ON. [Microform]. Retrieved from the London Room of the London Public Library, Central location.

St. Paul's Cemetery. (1988). *St. Paul's (Anglican), London, Canada, cemetery burials, 1852-1873*. London, ON. [Microform]. Retrieved from the London Room at the London Public Library, Central location.

Stets, J. E., & Burke, P. J. (2000). Identity theory and social identity theory. *Social psychology quarterly*, 224-237.

Stutz, L. & Larsson, L. (2016). Disturbing the Dead. Archaeothanatological analysis of the stone age burials at Zvejnieki, Latvia (Excavated 2006-2009). *Journal of Archaeological Science: Reports,* 10, 715-724.

Sutton, M., Conyers, L. B., Day, A., Flinders, H., Luff, F., Madua, S., De Jersey, Zoe., De Jersey, S., Savo, R., & Busch, W. (2013). Understanding cultural history using ground-penetrating radar mapping of unmarked graves in the Mapoon Mission Cemetery, Western Cape York, Queensland, Australia. *International Journal of Historical Archaeology*, 17(4), 782-805.

Sweich, S. M. & Wilson, R. A. (2015, February 5). Ugly laws. *Encyc*. Retrieved from http://eugenicsarchive.ca/discover/encyclopedia/54d39e27f8a0ea4706000009

Tibbett, M. (2008). The basics of forensic taphonomy: Understanding cadaver decomposition in terrestrial grave sites. In M. Oxenham (Ed.), *Forensic Approaches to Death, Disaster and Abuse*, (pp. 29-36). Australian Academic Press.

Timmins Martelle Heritage Consultants Inc (TMHC) (2018). *Stage 1 archaeological assessment, 900 King Street, part of Lot 11, Concession C., geographic township of London, City of London, Middlesex County, Ontario.* Archaeological report on file with The Ontario Ministry of Heritage, Sport, Tourism and Culture Industries.

Timmins Martelle Heritage Consultants Inc. (TMHC) (2019a). Land use history for the St. Paul's Anglican Church property.   Archaeological report on file with Timmins Martelle Heritage Consultants Inc.

Timmins Martelle Heritage Consultants Inc. (TMHC) (2019b). *Stage 2 archaeological assessment, mechanical trenching – Canada Building Western Fair District - 900 King Street, part of Lot 11, Concession C., geographic township of London, City of London, Middlesex County, Ontario.* Archaeological report on file with The Ontario Ministry of Heritage, Sport, Tourism and Culture Industries.

Tite, M. S. (1972). The influence of geology on the magnetic susceptibility of soils on archaeological sites. *Archaeometry* 14:229–236.

Trompette, P., & Lemonnier, M. (2009). Funeral embalming: the transformation of medical innovation. *Science Studies*, *22*(2), 9–30.

Trotter, M., & Hixon, B. B. (1974). Sequential changes in weight, density, and percentage ash weight of human skeletons from an early fetal period through old age. *The anatomical record, 179*(1), 1–18.

Troutman, L., Moffatt, C., & Simmons, T. (2014). A preliminary examination of differential decomposition patterns in mass graves. *Journal of forensic sciences, 59*(3), 621-626.

Van Brenk, D. (2019, Feb. 22). Cemetery team, UC reno earn heritage nods. *Western News*. Retrieved June 28, 2020, from: https://news.westernu.ca/2019/02/cemetery-team-uc-reno-earn-heritage-nods/.

Vass, A. A. (2001). Beyond the grave-understanding human decomposition. *Microbiology Today*, *28*, 190-193.

Watts, C. M., White, C. D., & Longstaffe, F. J. (2011). Childhood diet and Western Basin Tradition foodways at the Krieger Site, Southwestern Ontario, Canada. *American Antiquity*, *76*(3), 446-472.

Willis, G. (2018). The potter's field. *Comparative studies in society and history*, *60*(3), 539–568. https://doi.org/10.1017/S001041751800018X

Wilson, J. & Horne, M. (1996). *The City of London archaeological master plan, Volume 2: Sites data*. Department of Planning and Development, City of London.

Woodland Cemetery. (n.d.(a)). *Woodland Cemetery history*. Retrieved May 30, 2019, from: https://woodlandcemetery.ca/63/History.html

Woodland Cemetery. (n.d.(b)). Box: "Woodland Cemetery"; folder: "St. Paul's Cathedral fonds: St. Paul's Cemetery: History - Prec 2013", documents on file with the Huron Anglican Diocese Archives, London, ON, Canada.

Woodley, P.J. (1992). The Stirrup Court Cemetery coffin hardware. *Ontario archaeology* 53, 45-63.

Young, L. & Russell, A. (2017, February 23). Dying alone: Hundreds of bodies are going unclaimed in Ontario and Quebec. *Global News*. Retrieved from: https://globalnews.ca/news/3262664/dying-alone-more-peoples-remains-going-unclaimed-in-ontario-and-quebec/

Appendix 1 – Course Syllabus and Weekly Topics Grid for:

ANTHROPOLOGY 4493G/9104B

Advanced Special Topics in Anthropology/Advanced Bioarchaeology

Mortuary Archaeology

ANTHROPOLOGY 4493G/9104B
Advanced Special Topics in Anthropology/Advanced Bioarchaeology

Mortuary Archaeology

COURSE OUTLINE
Winter 2020

Class day/time: Monday, 1:30-4:30pm

Classroom: SSC 2257

Instructor: Andrew Nelson

Office: SSC 3410

Office hours: Tuesday 2-3pm; Wednesday 4:30-5:30pm

Email: anelson@uwo.ca

Teaching Assistants: none

Credit value: 0.5 credit

Calendar Course Description: This course takes a cross-cultural and deep temporal perspective on how different societies have dealt with the loss of one of their members. Mortuary archaeology draws on many different threads in Anthropology, including ethnography, cultural theory, bioarchaeology, archaeological theory, forensic analysis to name only a few. It also reaches beyond the bounds of Anthropology to draw on research in Sociology, Biology and other disciplines to take a truly interdisciplinary approach to how societies deal with death.

Antirequisite(s): none

Prerequisite(s): 4493G - Registration in fourth year in Anthropology and permission of the instructor. A minimum grade average of 80% in 2200-level and higher Anthropology courses is recommended.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. The decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Course Syllabus:

"…Tis impossible to be sure of anything but *Death* and *Taxes*" (Christopher Bullock, 1716, *The Cobbler of Preston*). There are myriad ways in which societies have dealt with this stark reality, and the rituals they construct shed important light on the society at large.

In mainstream North America, we have a very uniform, hygienic and medicalized view of death and burial, while the range beliefs and practices of other contemporary and ancient cultures is quite remarkable.

This is a lecture/seminar course open to senior undergraduate students. Weekly meetings will include short lectures followed by student presentations and/or class discussions. Class participation is mandatory. The critical evaluation of the literature will be emphasized.

A full course schedule including a week-by-week breakdown of topics and assigned readings will be available on the course's OWL site before the first day of class.

Learning Outcomes:

By the end of the course you should be able to:

- describe how societal structures and beliefs shape ritual behavior (observed through ethnographies), particularly in the mortuary context
- recognize how archaeology has contributed to our understanding of variability in societies' responses to death
- integrate perspectives from several disciplines in the analysis of an archaeological mortuary context
- reflect on how modern beliefs and norms shape how we act and react in the face of the death of a loved one
- work with your peers in a collaborative framework

Course Materials:

Registered students will be able to access information about additional course readings through the course's on-line OWL site before the first day of class.

Students will provide additional readings as part of the weekly discussion. There is no textbook.

Evaluation:

Weekly reflection papers/Class participation – 20%

Assignment #1 – ethnographic example of a mortuary ritual – 20 %

Assignment #2 – research paper on the analysis of an archaeological mortuary context – ca. 2500 words (honours students) or 3500 words (graduate students) – 20%

Assignment #3 – group project on a local cemetery – 40%

- there is no final exam

Details of the Assignments:

- Weekly assignments/Participation - write a 500-word reflection paper on the week's readings and one additional paper that you find. What is the key point of the readings? How are they relevant to you and to the week's theme? Bring the paper to class and be prepared to present your papers to the class and to discuss the papers provided as well as the papers brought by the other students.
    - o partial participation grades will be posted to OWL in week 8

- Assignment #1 – find an ethnographic account of a contemporary (or penecontemporaneous) society that describes and discusses a mortuary ritual. Craft a detailed description of this ritual and then analyze it using principles discussed in class. Important components of the analysis will include: does the ritual fit with the general structure of rites of passage rituals espoused by Van Gennep? Does the ritual reflect the sociopolitical complexity of the culture?
    - o the results of this assignment will be presented to the class as a 20-minute power point presentation in week 4 (January 27th).

- Assignment #2 – write a 2,500 or 3,500 word research paper on an archaeological mortuary context not discussed in class. You will need to present a short description of what is known of the archaeological culture and the specific context in order to undertake an analysis of how the mortuary context reflects the society as a whole. Draw on all appropriate ethnographic analogies, archaeological theories and anthropological models in your analysis.
  - o the results of this research will be presents as a manuscript for submission to the journal *Antiquity.* Its instructions for authors page is here.
  - o The research paper is due March 9th, 2020 in class in printed form and it should be submitted to OWL by 11:55pm that evening. Assignments that are not submitted on the due dates will be assessed a late penalty of 5% per day; assignments that are more than a week late will not be accepted.
  - o All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com.

- Assignment #3 – Assignment 3 is a group project that has both hands-on "field work" at the Woodland Cemetery and archive sleuthing aspects to the project. There will be two components: one a field component at the cemetery in the "Potter's Field", where hundreds of people were buried in unmarked graves on unconsecrated ground just at the edge of the main cemetery (see here for some context). Then, you will need to do some archival/historic research of what led to the formation of this particular mortuary context. The fieldwork will hopefully (weather permitting) involve ground penetrating radar, survey, mapping and photography.
  - o representatives from Woodland Cemetery will come to class on January 20th to discuss the project.
  - o the results of this assignment will be presented and discussed in the last class. Each student should submit a 2-page (500 word) description of their contribution to the project (due March 30th).
  - o the graduate students will coordinate the assembly of the final report
  - o the group will also prepare a report that can be presented to the cemetery for their records. This report will be due April 6th and will be submitted electronically and in hard copy to Dr. Nelson by 4:30pm.
  - o details of the report form and content will be worked out in class.

Course Specific Statements and Policies:

Statement on Seeking Academic Consideration:

Academic consideration will not be granted retroactively more than 10 days after an assignment's due date or a missed quiz or test. Please consult university policies on procedures for seeking academic consideration here:

Statement on Plagiarism:

Students must write their assignments in their own words. Whenever students take an idea from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing. It is also a scholastic offence to submit the same work for credit in more than one course. Plagiarism is a major scholastic offence.

Policy on Laptops and Cellphones in Class:

Laptops are permitted for note-taking in class but if it is observed that students are on social networking sites, they will be asked to close the laptop and will not be permitted to use it for the remainder of the class. Be sure that all cellphones are turned off at the beginning of class.

Institutional Statements and Policies

All students should familiarize themselves with Western's current academic policies regarding accessibility, plagiarism and scholastic offences, and medical accommodation. These policies are outlined, here: Western's academic policies.

Advanced Special Topics in Anthropology/Advanced Bioarchaeology
Mortuary Archaeology
Anthropology 4493G/9104B

Weekly Discussion Topics and Assigned Readings

Week	General Topic	Specific Topics	Example Readings
week 1 Jan 6th	Introduction – discussion of the definition and evolution of Mortuary Archaeology	Mortuary archaeology; Archaeothanatology	Binford (1971) Mortuary practices: Their study and potential; Knusel (2014) Crouching in fear: Terms of engagement for funerary remains
week 2 Jan 13th	Ethnographic studies of mortuary rituals; Broad anthropological/ sociological Analyses of mortuary rituals	Tripartite structure of rites of passage	Parker Pearson (1982) Mortuary practices, society and ideology: an ethnoarchaeological study; Van Gennep (1909) Rites of Passage; Huntington & Metcalf (1991) Celebrations of Death - Introduction
week 3 Jan 20th	The mortuary ritual in the modern world	The North American funeral industry	Huntington & Metcalf (1991) Celebrations of Death – American Deathways Sanders, G. (2012). Branding in the American funeral industry.
week 4 Jan 27th	Presentations of assignment #1	Ethnographic studies of mortuary rituals	
week 5 Feb 3rd	Death and burial in the paleontological record	Contexts of discovery of fossil hominin remains; *Homo naledi;* Neandertals	Gargett (1989) Grave shortcomings; the evidence for Neandertal burial
week 6 Feb 10th	Death and burial in the Neolithic	The first mortuary monuments – Tombs for the Living	Fleming (1973) Tombs for the living
week 7 Feb 17th	Reading Week		
week 8 Feb 24th	Death and burial in Ancient Egypt	The Book of the Dead; Mummies and the industry of death	Meskell (2001) The Egyptian way of death
week 9 Mar 2nd	Death and burial in Classical Antiquity	The use of mortuary ritual to reinforce fledgling states	Pollock (1991) Of priestesses, princes and poor relations: the dead in the Royal Cemetery of Ur
week 10 Mar 9th	Death and burial in Pre-Columbian Peru	The venerated ancestors	Isbell (1997) Royal mummies of Inca Cuzco
week 11 Mar 16th	Death and Burial in Middle Age Europe	Mortuary rituals and mass death – The Black Plague	Antoine (2008) The archaeology of the "plague"
week 12 Mar 23rd	Death and burial in popular culture	Deviant burials; Hollywood and the undead	Durkin (2003). Death, dying and the dead in popular culture.
week 13 Mar 30th	Presentation of assignment #3		

Appendix 2 – Abaza, L. (2018). *Lost and found. Untold stories from Woodland's "potter's fields".* Unpublished walking tour brochure. Woodland Cemetery: London, ON.

- reproduced here with the permission of Leah Abaza, Levi Hord and Woodland Cemetery.

8 JOHN KELLY
1857 – 1881

John's monument

John was one of 200 people who lost their lives May 24, 1881 when the steamboat *Victoria* wrecked in the Thames. He was born in Ireland before moving to England, then immigrating to Canada where he worked as a labourer. Thinking about the various circumstances of death, often we know it is coming, but when a disaster happens we are not always prepared. Funerals and burials are costly events that some families could not afford, so the "Potter's Field" was the next option. Among the others who died from the Victoria Day Disaster and are buried in this lot are: Alice and Edward Williamson, Henry Abey, Lotticia Swanwick, and Glanville G. Wiseman.

9 EMMA WILSON & ESTHER BARNES
1848 – 1867 & 1842 – 1902

Emma was 19 years old when she died from "suicide at the brothel." The press described her as an "abandoned female tired of life" and went on to make a spectacle of her death, warning against the fate of a sinner. Compared to the often heroic, feminist portrayal of Esther Barnes, who fought against criminal charges for keeping a bawdy house, Emma was shamed for working in the sex industry. The occurrence of her suicide alone would have been enough to earn her burial in the "Potter's Fields," so adding that she was a sex-worker was even more fitting.

Esther Barnes' monument

LOST & FOUND
Untold Stories From Woodland's "Potter's Fields"

"Lost & Found" tells the stories of some of the people buried in Woodland's (and old St. Paul's Cemetery's) "Potter's Fields": those who were buried without much thought about how to preserve their memory for future generations. These people were often living in poverty, in institutions, were recent immigrants to the city, or met unfortunate ends. Their lives and stories, however, were just as vibrant as any of London's founding families. Through our research and monument conservation work, "Lost & Found" brings some of this history to light. This tour helps us understand more about the politics of memorialization, including whose stories we choose to remember and why.

Follow us @woodlandcemeteryhistory

1-2 DR. BUCKE & THE ASYLUM GRAVES
1837 – 1902

The London Asylum for the Insane opened its doors in 1870. Their 500 beds were filled instantly with those whom records refer to as "lunatics," "idiots," and "degenerates." People were shamed for going to the asylum and, in some cases, families mourned one's committal as though they had actually died. Eventually, the asylum became home, and those who were not claimed by their families upon death were sent to the "Potter's Fields."

One of the asylum's doctors was Dr. Richard M. Bucke, whose views about mental health prompted experimental surgeries including hysterectomies and, eventually, lobotomies.

First stop at Dr. Richard M. Bucke's monument. Second stop at unmarked asylum graves

3 WILLIAM WILSON
1880–1904

William was a burglar who was shot in the chest and throat by the police in a heated standoff after robbing Cole's woodturning shop in February 1904. He and his accomplice stole tools and diamonds from various locations across South-Western Ontario. William was unknown to the police prior to his demise, but it was believed that he immigrated to Canada from America only a couple years before his death. Since he had no next of kin to anyone's knowledge, his status as a criminal warranted his burial in Woodland's "Potter's Fields."
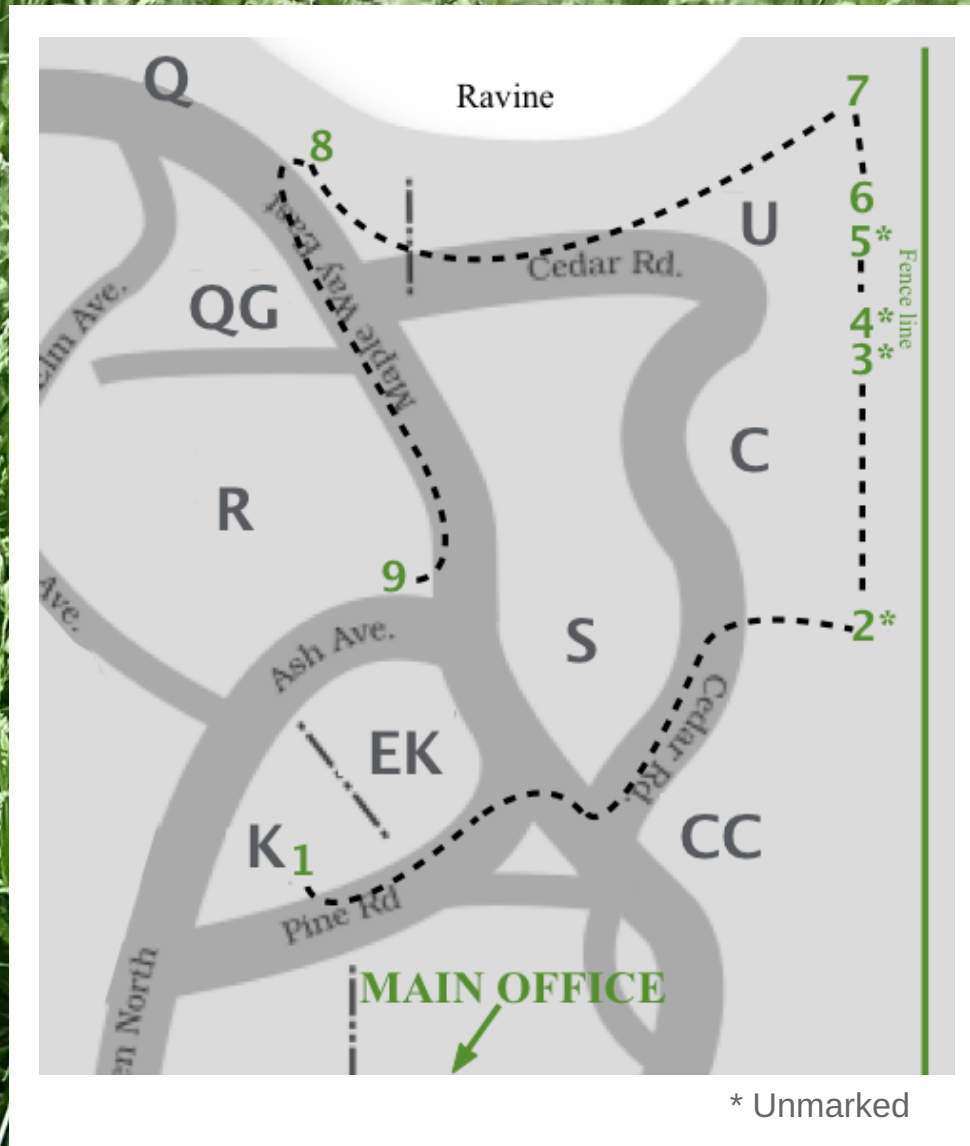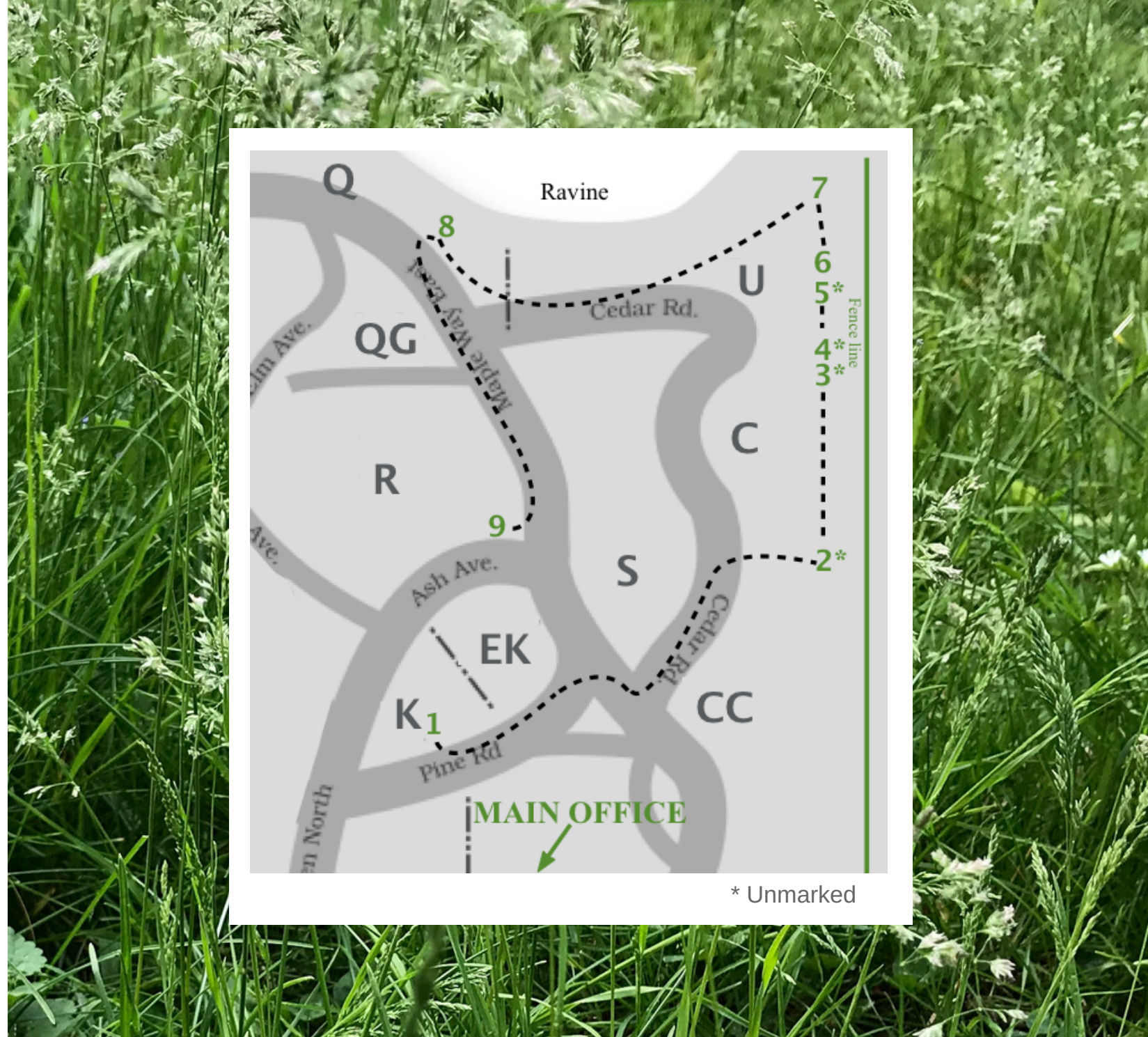
4 ALICE HELENA WILSON
? – 1925

In July of 1925, a woman washed up on the bank of Thames River and was discovered by two 13-year-old boys. With time running out before her body completely decomposed and with no identification made, she was sent to our "Potter's Fields." At some point after her burial, the mystery woman was identified as Alice Helena Wilson. Alice's body was exhumed and moved to Ingersoll, though records to prove the details of this information are scarce. Her grave at Woodland is empty and her resting place today is unknown.

"Potter's Field" along the back fence line in section U where William and Stephen rest, and where Alice was originally buried

5 STEPHEN HOVATS
1877 – 1933

When he died, the press labelled him a "tramp," a "transient," and a "mental case." These words are diminutive of the true Stephen Hovats who was hit by a train in Hyde Park, yet are the only words left to describe him. As someone experiencing homelessness, his only identifiers were the buttons on his clothes and the utensils in his pockets. The inscriptions on these items indicated that he was staying at a local institution, either the Asylum or the jail.

Q
Ravine
8
U
7
6
5*
QG
Cedar Rd.
4*
3*
C
R
9
2*
S
EK
CC
K 1
Pine Rd.
MAIN OFFICE
Ash Ave.
Maple Way North
Elm Ave.
Cedar Rd.
Fence line
* Unmarked

"POTTER'S FIELD" IS A BIBLICAL TERM THAT REFERS TO AKELDAMA, BOUGHT BY THE HIGH PRIESTS OF JERUSALEM FOR THE BURIAL OF STRANGERS, CRIMINALS, AND THE POOR, AND PAID FOR WITH THE COINS THAT HAD BEEN PAID TO JUDAS ISCARIOT FOR HIS IDENTIFICATION OF JESUS. AKELDAMA, IN THE VALLEY OF HINNOM, WAS A SOURCE OF POTTERS' CLAY. AFTER THE CLAY WAS REMOVED, SUCH A SITE WOULD BE LEFT UNUSABLE FOR AGRICULTURE AND THUS MIGHT AS WELL BECOME A GRAVEYARD FOR THOSE WHO COULD NOT BE BURIED IN A TRADITIONAL CEMETERY.

6 TING YEUNG WONG
? – 1933

Ting's legacy lives through lessons of preserving history. Woodland's records all indicate that his name was "Ing," but the proper translation of the Cantonese characters on his marker reveals his

name to have been "Ting." Knowing the racist social climate that the Chinese Immigration Act promoted in the late 1800s, this discrepancy was likely a product of poor translation and general miscommunication. The same is true for many

Ting's marker

records of other immigrants who spoke little English. Today, we must ensure that our records are filled with correct data so that our future generations are remembered and history is preserved.

7 ST. PAUL'S &
JOHNATHAN MITCHELL
1846 – 1873

Before Woodland opened in 1879, it existed as St. Paul's Cemetery (now the Western Fair District). When the bodies from St. Paul's were moved to Woodland, their "Potter's Field" was also transferred. Here, the "unknown dead" from

memorial monument

St. Paul's are remembered along with Johnathan Mitchell, a 27-year-old carpenter who immigrated to Canada from England. He was living at the Asylum when he died from suicide.