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No Easy Path: A Ground-Penetrating Radar Investigation of the Historic Penfield Cemetery.

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by

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Under the Direction of Dr. Jeffrey Barron Glover

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ABSTRACT

Numerous historic cemeteries in the rural American South currently face deterioration due to natural and human elements. Those founded by enslaved African American communities are particularly vulnerable due to historical inequities, and to events affecting Black populations after emancipation. Rediscovery of these sites prompts inquiries into best practices for their preservation and revitalization. Tools such as Ground-Penetrating Radar (GPR), have proven valuable in addressing preliminary questions essential for effective cemetery preservation efforts. This thesis employs GPR to assess the number and distribution of burials in the historically segregated African American section of the Penfield Cemetery in Greene County, Georgia. Following archaeological praxis, the study emphasizes collaboration with diverse stakeholders invested in safeguarding this valuable resource as a part of a broader initiative to conserve and revive the cemetery. Findings will be integrated into a publicly accessible digital database, fostering engagement with the results among community members, the public, and future researchers.

INDEX WORDS: African American Cemeteries, Applied Anthropology, Archaeological Geophysics, Ground-Penetrating Radar, Praxis, Historical Archaeology

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DEDICATION

For my Dad.
For my Mom.
For my Sister.
For Penelope.

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This project represents collaborations and connections between a multitude of individuals, organizations, and institutions which began to coalesce long before this project took shape. This is an incomplete list of individuals who knowingly or unknowingly were instrumental in guiding and facilitating this thesis. I could not have done this work without each and every one of the people listed here.

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TABLE OF CONTENTS

LIST OF FIGURES

1. INTRODUCTION

Cemeteries represent sacred spaces which contain information on a multitude of cultural traditions related to death and the afterlife. Through cemetery research, we can gain insight into the past lifeways of buried individuals and the communities of which they were a part. Ideally, these insights can be used to draw connections between living populations and their ancestors, enriching historical and anthropological knowledge which may serve a multitude of stakeholders including descent communities and those with academic interests, alike. The geography, the burial methods, grave markers (or lack thereof), and flora within cemeteries all contain valuable cultural and historical information that can be used to achieve various goals surrounding cemetery research.

Oppressed and marginalized people are frequently underrepresented in the historical record, and cemeteries represent an invaluable supplementary historical resource where written records were never kept or are not presently accessible (Bigman, 2014; Foster and Eckert, 2003; Little, 1998; Melville, 2022; Strangstad, 2013; Trinkley and Hacker, 2007). Cemeteries frequently act as ceremonial spaces where community members may access, visit with, and pay homage to their deceased relatives, in some instances simultaneously serving as something akin to a public park (Jones, D., 2011; Melville, 2022). In the case of many rural cemeteries in the southern United States, however, a multitude of factors have led to their falling into disrepair to the point that they have become overgrown with vegetation, their markers degraded, moved, or covered, and their presence effectively forgotten (Martin and Everett, 2023; Rainville, 2016; Spera et al., 2022). This phenomenon particularly stands to affect cemeteries that were founded and utilized by marginalized or minority populations that lacked the resources to own or maintain the many acres of land oftentimes characteristic of cemeteries located in the rural South (Rainville, 2016; Singleton, 1999; Suggs, 2023).

Burial spaces utilized by African American communities living in the pre-emancipation South were often founded on marginal land, frequently in heavily wooded areas unsuitable for farming or other uses (Brooks, 2011; Khan, 2022; Rainville, 2016). The characteristics of landscapes common to many historic African American cemeteries in the rural South have been subject to various interpretations. Proposed explanations for these phenomena have respectively attributed their inception to the restrictive nature of enslaved person / owner relations, as a means to maintain privacy, or as a continuation of traditional African practices resulting in a sort-of "creolization" in mortuary treatment between traditional African and European forms (Rainville, 2016; Singleton, 1999:5). The locations and patterns of disrepair within these historic cemeteries are in part a product of restrictive laws surrounding the institution of slavery which were perpetuated by Jim Crow-era policies in the 20th century, which served to reduce access to resources within Black communities living in the South. If restrictive socio-economic policies led to difficulties in preserving and maintaining historic African American cemeteries during their use-life, these difficulties were likely compounded by the historically documented mass migration of Black communities from the South during the period known as the Great Migration (Collins, 2020; Rivers, et al. 2015).

The condition of Penfield's African American cemetery today appears to reflect past inequities and oppressive institutions, the effects of which appear visible in the unkempt and overgrown landscape of the cemetery at present. When contrasted to the well-manicured White section of the cemetery, it seems clear that the effects of socioeconomic inequities related to slavery and the Jim Crow South have manifested in the present day. This phenomenon has implications for the research conducted for this thesis, as access to the cemetery and the research conducted within it have been made considerably more difficult due to various natural and manmade barriers which may be related directly or indirectly to the origins and history of Penfield's African American cemetery. Standing and fallen trees, low lying overgrowth, and topographic features naturally contribute to difficulties in collecting usable geophysical data at Penfield. A brick and stone wall constructed in 1948 surrounds Penfield's White section and serves to reduce access to its African American section. These barriers can be viewed as direct or indirect results of Penfield's inception and history as a 19th century African American cemetery founded in the rural South. Rural, underserved cemeteries may often represent the last supplemental data source available for telling the stories of the oppressed communities which have played such an instrumental role in shaping the United States, and particularly the Southeast. Their preservation is thus critical in developing a historical account for the United States which is holistic, inclusive, and accurate. The aforementioned barriers thus serve to complicate efforts to include marginalized voices in the historical record.

1.1 Cemeteries as Repositories of Cultural Heritage

Research that involves the African American diaspora in the southern United States may be limited in scope due to the lack of formal records and written history surrounding communities who suffered from racist laws and practices perpetuated by the United States slave economy (Babson, 1990; Williams, 2005). Within this framework, enslaved African and African American communities had few resources with which to record the events of their own lives. The regulation of literacy for enslaved persons from 1740-1874 compounds difficulties in discovering African American histories, as it would have been illegal for enslaved persons to generate their own written records (Maddox, 2022; Williams, 2005). Heather Andrea Williams (2005) cites her own difficulties in discovering Black voices when attempting to research literacy trends in African American populations from historical sources. Oftentimes for Williams (2005: 1), Black voices are found tangentially or "between the lines" where literate Black figures are "mentioned in passing," requiring a meticulous piecing together of information to create a cohesive narrative.

Cemeteries can be seen as supplementary sources of sociological, archaeological, and historical data where other records might not exist. Engravings on headstones and mortuary records are cited as valuable cultural resources from which information on “sex, ethnicity (as ascribed by surname), age, mortality patterns, marital status and other familial relationships, as well as migration and occupational data,” can be derived (Foster and Eckert, 2003:469). Difficulties abound, however, in creating narratives of African American lifeways through mortuary analyses. The frequent lack of inscribed headstones complicates this process, as does the variation in cultural adaptations surrounding burial rites which were necessarily undertaken under the influence of slavery and oppression before and after emancipation. Not all circumstances were alike; not all “freedoms” were able to be exercised in the same way and to the same degree; and enslaved and free African American people did not all share the same cultural heritage before slavery (Brooks, 2011; Jamieson, 1995). Interpretations of the material culture found within these spaces is therefore complicated. Despite these challenges, cemeteries are not diminished as valuable historical or archaeological resources. Cemetery research is especially significant in instances of historically marginalized communities where other sources of material culture have not been preserved and where no direct historical records remain for a given community or population. Research concerning historically marginalized populations can be strengthened through the implementation of archaeological methods conducted within community-based and praxis-based frameworks. Research conducted in this way aims to be collaborative, taking into consideration stakeholder guidance and input at every stage of the project with the goal of serving a purpose for the community in which the work is taking place (Kirsch, 2018; Kozaitis, 2000; McGuire, 2008). The impetus for this project came from local community members who recognized the need to tell the history of Penfield’s African American community. Site access was made possible through collaborations with Greene County community members. Research questions were discussed with a multitude of stakeholders, and data collection was facilitated through manual labor by a multitude of volunteers including White and Black members of Penfield's descent community. The interactions between myself, Greene County community members, academic institutions, and the general public were invaluable in completing the research at Penfield, as well as in bringing visibility to the efforts being undertaken within the space.

The first step in many preservation efforts of historic cemeteries is the determination of the approximate number and distribution of buried individuals within the space. Ground-penetrating radar has been proven to be an efficacious tool in guiding community-driven preservation efforts by answering these fundamental questions, while leaving the mortuary landscape intact (Bigman, 2014; Conyers, 2006; Gollam, 2021; Patch, 2009). The research described in this thesis was completed with the goal of estimating the number, distribution, and extent of buried individuals at Penfield while simultaneously collecting other relevant information which may aid in the preservation of the cemetery. This has been facilitated through the collection of GPR data throughout all areas of Penfield's African American cemetery which are currently accessible to the radar, and through the mapping of visible features with GPS. This thesis and the results of the research conducted for it will eventually be included in a publicly accessible and updatable digital heritage database that will foster interaction and learning surrounding the cemetery. Information surrounding Penfield, its history, and the archaeological data gathered within it will thus be made available for researchers, descent community members, and various other interested persons into the future. This thesis serves as an example of community-based archaeological research which brings together stakeholders from various institutional and cultural backgrounds with common interests in the revitalization of Penfield's African American Cemetery and the history of its people. The research conducted for this thesis will serve to bolster the historical record for African American communities living in the rural South, and which will help guide preservation and revitalization efforts within the cemetery space.

1.2 Penfield Site Description

The Penfield Cemetery is a historic rural cemetery situated in Greene County, GA (Figure 1). Penfield is characterized by physically segregated White and Black sections which lie in stark contrast to one another with regards to landscape, topography, mortuary treatment, visibility, and access. Penfield's African American section embodies many of the common features of African American cemeteries in the rural South, as it is situated on heavily wooded land with steep topography and includes a relatively wide range of burial morphology (Jamieson, 1995; Rainville, 2016).

While the founding date for Penfield's African American section is presently unknown, it likely predates the Civil War, spans Emancipation, and appears to have fallen to disuse sometime in the 1950's. In 1948, the construction of a stone, brick, and mortar wall (Figure 2) resulted in reduced access to Penfield's African American section amidst the continued migration of Black communities out of the South (Williams, 2021).

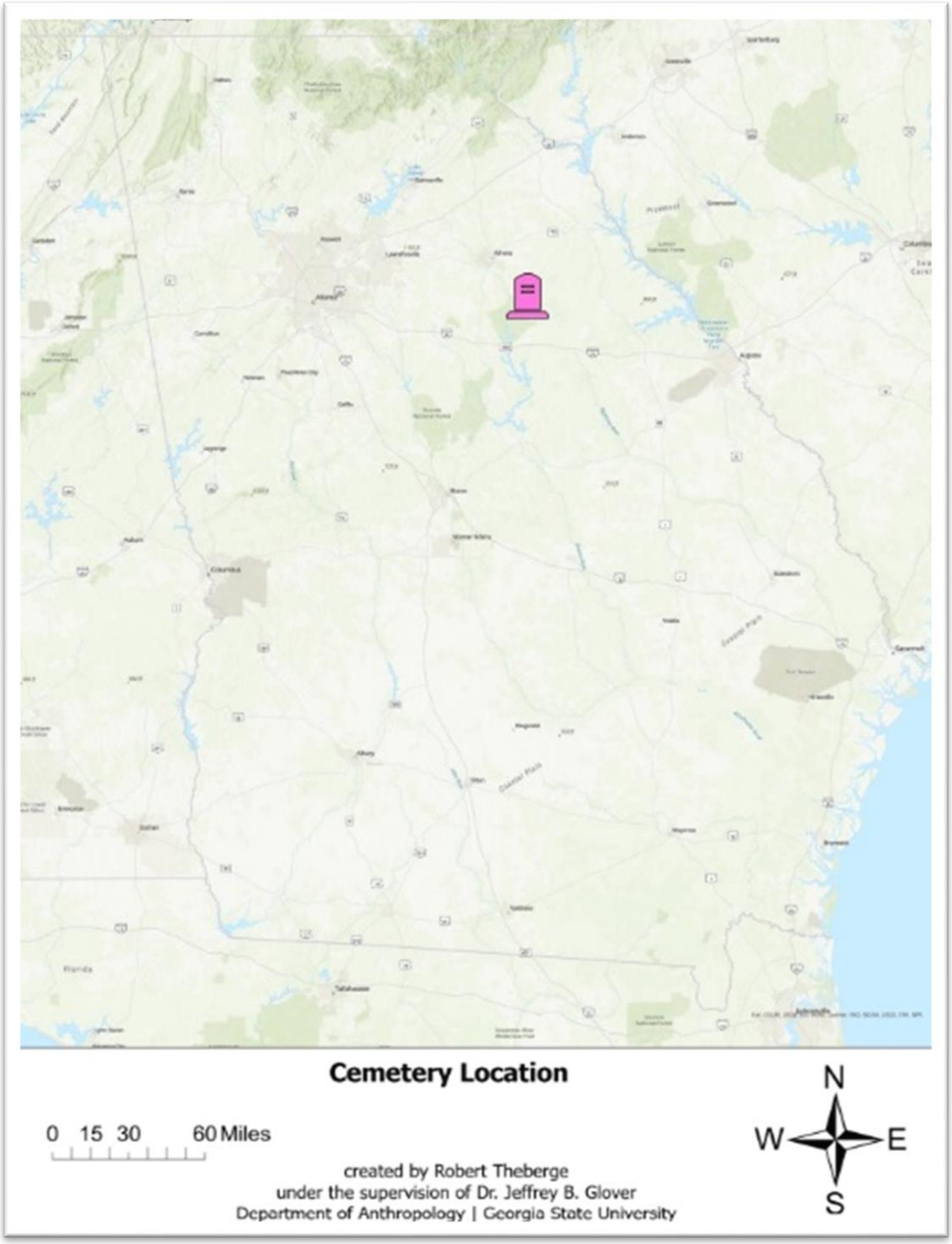

Figure 1: Penfield's location in the state of Georgia.

Figure 2: The wall separating Penfield's White and Black sections. The break in the wall was created in 2019 by Mercer University students to create an access point for Penfield's Black section.

Though its exact origins are presently uncertain, the Penfield Cemetery was most likely founded as a cemetery for enslaved persons who worked on one of the several surrounding plantations (Figure 3). The lack of funeral records and engraved headstones within Penfield means that indirect sources must be used to make inferences about the earliest people interred at Penfield, such as church minutes, accounting ledgers which might account for a plantation owner’s property (i.e., number of enslaved persons), and other court records. Approximately seven plantations on which fifty or more enslaved persons lived and worked existed within three miles of Penfield in 1860 (Figure 3). A large plantation owned by Oliver Porter sat north of Penfield, a 1000-acre parcel of which was sold to B.M. Saunders (Sanders) in the 1940's BM Sanders was also a likely plantation owner in the region in the 1840's (Rice and Williams, 1979; Thompson, Doug. 2023).

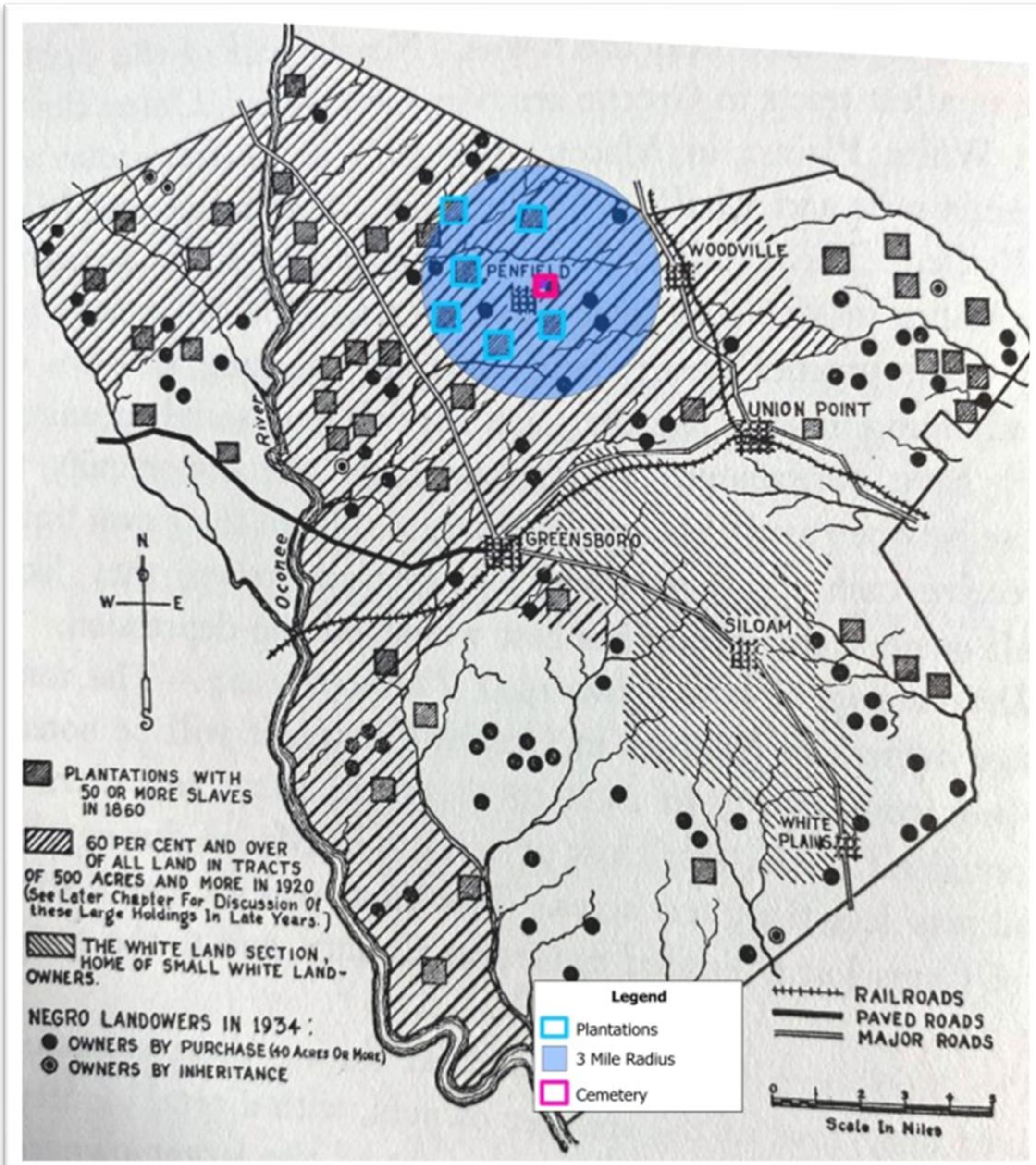

Figure 3: This image highlights the distribution of plantations with 50 or more slaves in 1860 within a 3-mile radius from the Penfield Cemetery. Image taken from Raper, A. F. (1936).

The first mention of the Porter family cemetery is in the deed of sale, which stipulates that 0.25 acres should be retained for the Porter family cemetery where William Porter's mother and father are buried (Greene County, Georgia Clerk of the Superior Court. Deed of Sale, 1841). Given the existence of seven Porter memorials and 25 Sanders memorials within Penfield's White section, including that of Oliver Porter (d. 1838), as well as B.M. Sanders, (d. 1854), it is possible that the Porter Family Cemetery and associated plantation represents the origins of the Penfield Cemetery (Rice and Williams, 1979; Personal communication with Dr. Doug Thompson, 2023). The size of Penfield's African American section (approximately 3 acres in area), along with its apparent density and its central location in relation to a concentration of large plantations, suggests a relatively large population of enslaved persons before emancipation as well as a large community of free African American people having utilized the space over the course of its use-life.

1.3 Research Questions

The research outlined in this thesis was conducted following an inductive method of inquiry which favored the gathering of large amounts of data in order to foster various observations and research questions being developed throughout the course of the project and into the future. Research began with impetus from various stakeholders interested in generating archaeological data which would set the stage for continued preservation efforts in a space where virtually no primary sources of information are known to exist. The gathering of archaeological data from the cemetery utilizing non-invasive techniques that result in minimal contextual destruction facilitates a number of anthropological, historical, and genealogical questions to be answered in the future, while leaving the cemetery intact. The scope of this project aims to generate geophysical and GIS datasets for the Penfield Cemetery which will allow for the determination of the approximate boundaries of the space, as well as the approximate count and distribution of burials within. All data and results, including this thesis, will be shared with the stakeholders, and will be entered into the aforementioned digital database in order to consolidate geophysical, geospatial, historical, and archival data. This is intended to foster continued learning and interaction by researchers and the general public with historical and archaeological resources pertaining to Penfield by anyone with interest in the continued preservation of this sacred space and its history. Data and results will be hosted through databases associated with the Historic Rural Churches of Georgia and Emory University's Pitts Theology Library, respectively. This initiative is further discussed in chapters eight and nine.

Research at the Penfield Cemetery has been undertaken within a praxis-based ideology which centers questions and goals developed by community members in collaboration with various academic and non-academic stakeholders. Within this framework, this project attempts to leverage the results of research to produce new empirical knowledge that can be used to expose and confront historical inequalities, while ideally serving to improve conditions for past and present communities with ties to Penfield's history (Glover et al., 2012; Khan, 2022; Kirsch, 2018; Kozaitis, 2000; McGuire, 2008;). A research design was developed that would best address community-centered goals, while being feasible within the confines and scope of this Master's thesis project. Community-driven efforts to document the cemetery provided the impetus for this phase of work, which will ultimately serve to guide stakeholder-driven preservation efforts of the space while contributing to our understanding of the histories contained within. With this research, I submit the notion of *preservation as praxis* (Kirsch, 2018; Kozaitis, 2000; McGuire, 2008). Given the significance of cemeteries as historical and anthropological resources, research, and preservation efforts within them help bring together various stakeholders within and outside of the community, contributing to the overall notoriety and visibility of these often-marginalized spaces and their respective histories. Through these interactions at Penfield, historical and structural inequality rooted in racism is exposed and confronted through collaborative efforts centered around the collective consensus that the history of Penfield's African American population is underrepresented, and that it deserves to be told. Interactions surrounding Penfield such as meetings between collaborators, volunteer cleanup days, coverage from local news outlets, as well as the performative aspect of conducting research within the space collectively serve to increase visibility of the Penfield Cemetery and of the preservation efforts within it. Preservation as praxis draws from the idea that culture is a valuable resource (Kirsch, 2018), and that actions which lead to the preservation and revitalization of underrepresented cultural resources are themselves acts of Praxis and political intervention. Preservation efforts inherently generate knowledge and increase visibility of a space or group of people through the necessary collaboration and direction of resources required in many instances to achieve the goals of preservation. The very act of entering a space and conducting research within it can be viewed as an intervention, and the generation of new knowledge prompted by this research will guide and strengthen the preservation efforts focused on the Penfield Cemetery and others like it in the future.

1.4 Chapter Outline

Chapter two provides a discussion on the theoretical underpinnings of this work, which are rooted in applied archaeology and praxis. The chapter contains discussions on the results of historical inequalities and oppression within spaces occupied by African American people in the 19th and early 20th centuries. Case studies for engaged and praxis-based archaeological efforts are summarized, and challenges in preservation efforts within these spaces along with the nature of collaborative archaeology to strengthen these efforts are discussed.

Chapter three provides a brief discussion of the historical context of the Penfield community. Penfield's setting within Greene County and Georgia's booming cotton industry are outlined, and the landscape and characteristics of Penfield's African American cemetery are discussed.

Chapter four outlines the historical context necessary for research within historical African American spaces. This chapter includes brief discussions on the growth of African American populations in the southern United States, and on mortuary practice in early African American communities in the United States. Variation in grave markers and burial customs within the Penfield Cemetery are outlined and are briefly discussed as a creolization of African and Christian European influences.

Chapter five discusses the origins of the research conducted within this thesis, and details the complex interactions which ultimately led to this project taking shape. The scope of work as determined in collaboration with stakeholders is also discussed. Chapter six outlines the methods followed in conducting GPR and GIS investigations within the scope of this project. Short discussions on the equipment used, data collection methods, and methods used for interpretation of results are included.

Chapter seven details the results of GPR and GIS investigations. This includes examples of data, and brief discussions on the types of signatures which were interpreted as positive responses for burials in the data. Methods for approximating the number and distributions of individual burials are discussed, and significant data, which is not indicative of burials, but are otherwise relevant to the cemetery are outlined.

Chapter eight discusses results and their significance to the Penfield cemetery effort, and in the broad effort to study and revitalize cemetery spaces and marginalized histories, and Chapter nine outlines brief conclusions and recommendations for the space moving forward.

2. PRAXIS AND APPLIED ARCHAEOLOGY

Research rooted in an engaged or community-based framework aims to be collaborative and community-centered with the goal of participating in a reflexive dialogue between researchers, community members, and beneficiaries, collectively known as *stakeholders* (Baba, 1997; Fryer, 2020; Kirsch, 2018; Kozaitis, 2000; McDavis, 2002; McGuire, 2008; Rylko-Bauer et al., 2006). The theoretical underpinnings of engaged archaeology or “praxis” archaeology can be found in a rich history of social and philosophical theories which have coalesced into an anthropological framework that advocates for undermining the status quo in anthropological research in favor of bolstering historically marginalized voices (McGuire, 2008; Rylko-Bauer et al., 2006). In a broad sense, seemingly disparate socio-political philosophies are connected through their respective aims of addressing various instances of systemic oppression, which have created and perpetuated social disparities historically, and into the present (e.g., Kirsch, 2018; Powell, 2008).

2.1 Archaeology and Praxis

Archaeologists are equipped to answer questions that the historical record may not have the capacity to address. This is significant in that much of the historical record has been written and curated by members of the affluent classes (Singleton, 1999; Williams, 2005). For much of the history of the world, non-elites did not possess the means for keeping permanent records due to a lack of material resources or lack of intellectual resources, i.e., literacy, or the ability to express literacy. Much of the historical documentation about historically oppressed populations in the United States is derived tangentially from mortuary records, oral histories, or other indirect sources from which cohesive narratives must be constructed (Williams, 2005). This lack of representation in the historical record is reinforced when considering the present condition of many historic African American cemeteries across the United States. In many of these spaces, visual clues that a particular area contains burials may be scant, and their existence may be largely overlooked or forgotten. To neglect to tell the histories of early African American peoples is to exclude an instrumental component of the growth of the United States and of the American South, as early African American people and American history are inextricably linked (Brooks, 2011). In instances where cemetery spaces represent the primary indicators that a particular group of people were present in a region, archaeologists can aid in the revision and rediscovery of otherwise absent or suppressed histories, fostering tangible connections and interactions between descent communities and their own heritage. Archaeological research can shed light on aspects of cultural heritage that are otherwise hidden to the historical record, but often so at the risk of “desecration” of these resources and remains in terms of physical testing or excavation (Jamieson, 1995:39). The application of non-invasive research methods, therefore, can alleviate these concerns, and geophysical testing may help to answer community-driven and archaeologically-driven questions alike through research which leaves the area of investigation in a relatively pristine state, while providing a dataset that can facilitate future research.

The results of archaeological research may have real-world consequences concerning our views of the past which, in turn, may manifest in a multitude of ways in the present. Ross W. Jamieson (1995) reminds us of our responsibility to seek out perspectives on the interests of stakeholder communities in their own cultural heritage, and to consider how archaeology might contribute to their own goals and interests surrounding this heritage. Ywone Edwards-Ingram (1997: 33) reinforces and advances these ideas, suggesting “true acts of inclusion” as the ultimate aim for community-based archaeology, which in its most ideal form may seek “...to redistribute representational authority” to those historically marginalized communities who often find themselves the subjects of potential archaeological research. These ideas help to ensure that research goals and outcomes are considered in a way where the “...induced change [as a result of research] has a beneficial effect” to the community (Bennett, 1996:28).

2.2 Preservation Efforts and Challenges Within Historic Cemeteries

The following case studies highlight instances where historic African American cemeteries and burial grounds have intersected with public and political discourse, development initiatives, local descent communities, and difficult histories. Archaeological research can be instrumental in the discovery and visibility of these spaces, the efficacy of which can be enhanced by collaborative efforts with community members and stakeholders with interest in cemetery preservation. These case studies range from relatively high-profile instances of the intersection of archaeology and the management of historic African American burial grounds to instances where GPR has been utilized in the state of Georgia in the discovery of unmarked burials in an African American cemetery. All these case studies have involved oversight by local communities which have largely guided preservation and management efforts within their respective investigations.

2.2.1 New York African American Burial Ground, New York, NY.

The work documented within the New York African Burial Ground in New York; NY epitomizes public involvement in cemetery preservation efforts. Not only was public concern and outcry a major impetus for the preservation of the space, but public opinion and involvement remained a guiding force throughout the course of the project. In 1991, amid learning of excavations of African American remains preceding the development of a 34-story office building on the site, a group of “influential and determined” African American community members, including African American House Democrat Gus Savage, coalesced to express concern about the significance of the site, and of their ancestors’ history (La Roche and Blakey, 1997: 85). From this initial impetus came prominent African American lawyers, politicians, academics, advocacy groups, and archaeologists all concerned with the respectful and ethical preservation and memorialization of those interred in New York’s oldest and largest African American burial ground.

The eventual direction of excavation led by prominent Black archaeologist Michael Blakey of Howard University, along with the inclusion of various African American-led advocacy groups and media outlets, led to discussions surrounding the “seizing of intellectual power” by African American people and the need for a “solid understanding of African American mortuary practices…” as a necessary component for sound, holistic archeological research in these instances (La Roche and Blakey, 1997: 93). This discussion followed the historic misrepresentation of the size and significance of this burial site, whereby over 400 individual burials were disinterred from 1991-1992, a huge departure from the supposed 50 estimated by early research projections. Furthermore, the gross mishandling of the initial excavations in which cultural background and historical significance were hardly mentioned in the initial research design, suggested the need for a more competent and “sympathetic” team to take over research (La Roche and Blakey, 1997). Upon gaining control of the research effort, Blakey and the team at Howard University proposed three overarching research questions: “What are the origins of the population, what was their physical quality of life, and what can the site reveal about the biological and cultural transition from African-to-African American identities?” (La Roche and Blakey, 1997:86).

In 1993, the African Burial Ground was designated a National Historic Landmark, and a monument was constructed in 2007 to memorialize and honor the people interred there. The monument and park rest on approximately 0.3 acres of land dedicated to the memory and remains of New York’s African American community. The memorial is surrounded by development on all sides, which includes the Ted Weiss Federal Building, the construction of which prompted the initial archaeological review of the space in 1991. Despite the best efforts of community members and archaeologists, this case represents a continuation of exploitation and misrepresentation of marginalized people from past to present, as the vast majority of this sacred space fell victim to unchecked development long before research efforts began in earnest. The area devoted to the memorial is but a small representation of the area needed to contain the estimated 15,000 individuals thought to have been buried in the space (National Park Service, 2017).

2.2.2 Oaklawn Cemetery, Tulsa, OK.

Beginning in 2018, efforts began to determine the location of individual burials and a potential mass grave related to Tulsa, Oklahoma's historic Greenwood community (Hammerstedt and Regnier 2019; Stackelbeck and Stubblefield et al. 2020; Thompson, 2020). The Greenwood community, also known as "Black Wall Street" (Thompson, 2020 quoting Booker T. Washington), was a thriving African American community in Tulsa, Oklahoma in the early 20th century that was famously destroyed in what has become known as the Tulsa Race Massacre of 1921. The research effort was collaborative from its outset. City of Tulsa Mayor G.T. Bynum initially teamed with local community members and various collaborators which led to the formation of three committees: a historical committee, one to oversee the physical investigation, and a public oversight committee.

Historic and ethnographic information generated by the various committees in collaboration with community informants led to the identification of regions of interest for the investigation. In order to cause as little possible disturbance within the context of an extremely sensitive investigation, GPR was employed before breaking due to its ability to non-destructively reveal buried features, as well as to approximate depths and orientations of said features before excavation. GPR has a rich history in cemetery archaeology, which sets the precedent for its ability to resolve burials underground (Bevan, 1991; Bigman, 2013; Sutton and Conyers, 2013). Due to its non-destructive nature, it was employed in Tulsa to assist in locating unmarked burials or mass graves within the Oaklawn cemetery where some of the individuals who were killed during the event were known to be buried (Hammerstedt and Regnier, 2019). When attempting to locate graves, information generated with GPR can be invaluable, as buried remains are fragile, and mistakes regarding depth and location, especially when heavy machinery is involved in excavation, can result in disastrous consequences if remains are inadvertently disturbed. In the case of Tulsa, GPR was essential in gathering information surrounding an emotion-laden event and has proven successful in guiding this important investigation (Hammerstedt and Regnier, 2019; Stackelbeck & Stubblefield et al., 2020). Researchers Scott Hammerstedt and Amanda Regnier were contracted to begin geophysical research in an attempt to locate mass graves related to the event. Geophysical research was undertaken at the Oaklawn cemetery based partially on eyewitness testimony and interviews from over 300 community members who have direct recollections of the event (Thompson, 2020).

Within the Oaklawn Cemetery, Hammerstedt and Regnier (the principal geophysical investigators) were able to resolve likely areas where unmarked graves were present, and specifically resolved evidence of a potential "common" grave, or an area where multiple individuals were interred at the same time, in the same area (Booker, 2020; Hammerstedt and Renier 2019). Based on results from the GPR investigation, corroborated by other below-ground imaging techniques, excavations began at Oaklawn cemetery which revealed evidence of a common grave within the cemetery grounds (Stackelbeck and Stubblefield, 2020; Thompson, 2021). This investigation drew on anecdotal information from local informants, from historical documents, and involved a public oversight committee made up of Tulsa residents who at every step of the investigation made decisions regarding next steps and were said to be "...in the driver's seat" (Odewale, Alicia 2021, as cited by Thompson, 2020). Notably, Phoebe Stubblefield, a forensic anthropologist and one of the principal investigators on the excavation team at Oaklawn Cemetery, can tie themself to the event through an aunt who lost her house in the massacre (Thompson, 2020).

The death toll for African American Greenwood residents ranges from at least thirty-six (those who had death certificates issued and archived) to upwards of three hundred or more, according to oral history and eyewitness testimony (Warner, 2000). Despite the existence of death certificates for some individuals, their places of burial are not documented, or those documents have not been recovered, and considering eyewitness testimony, the existence of mass graves in the area has been speculated for some time. As of 2022, at least 66 individuals had been located through geophysical testing and excavation (Romo, 2022). Geophysical investigation in this instance has facilitated efforts to recover the histories of the victims of the massacre. Excavations have been necessarily public-facing due to their relatively urban location at Oaklawn and the sensitive nature of this tragic event and have even been live streamed in some instances.

2.2.3 Archaeology in a Geechee Graveyard.

The research outlined in this case study was conducted through a partnership between local Geechee residents of the Hog Hammock community on Georgia’s Sapelo Island, and non-local individuals associated with academic institutions. The primary impetus for research was to detect the presence of unmarked graves within the historic Behavior Cemetery on Sapelo Island in order to mitigate damage to extant graves when digging new ones. The Behavior Cemetery has ties to early Baptist congregations on Sapelo Island, as well as the slave community of the same name associated with the Sapelo Island plantation of Thomas Spalding (Honerkamp and Crook, 2012). The cemetery’s existence is largely absent from historical maps and is shown to be located in an area which appeared heavily wooded in the 19th century based on georeferenced maps, typical of pre-emancipation African American cemeteries.

Meetings and consultations were undertaken between archaeologists and community members, resulting in the definition of three principal research questions or initiatives. 1) to “record all extant grave markers in Behavior Cemetery and make this information easily accessible to local residents;” 2) to “determine where future graves could be dug without disturbance to existing graves, relying in part on the application of ground penetrating radar (GPR) to detect unmarked graves;” and 3) to “investigate the spatial and temporal parameters of a nineteenth-century slave site within the cemetery parcel." (Honerkamp and Crook, 2012:103).

Research was conducted utilizing GPS systems and a total station to map over 375 visible stones and markers within the cemetery. GPR was then conducted in two non-contiguous regions to generate a representative sample of the approximately 5 acres of presumed cemetery area. A 10 x 10 meter region with apparent unmarked depressions was positive for unmarked graves and was used as an indicator for positive results in the main area of investigation. Approximately 180 unmarked graves were discovered in an area covering approximately 1.38 acres. The investigation was successful in guiding future interments in the Behavior cemetery by defining an eastern region of the cemetery property. Archaeologists and community members decided on a plan to designate "archaeologically sensitive" regions of the cemetery with wooden posts, as well as a map which designated sensitive areas which should no longer be used for interments.

The authors emphasize the rich history of collaboration between academic institutions and community members on the island through various research efforts and outreach efforts such as Archaeology Days meant to promote visibility for Sapelo Island and its history. The trust fostered from these previous interactions were essential in performing the research outlined in this case study.

2.3 Preservation and Praxis.

Preservation, practice, and praxis may intersect in various ways. When a resource under consideration for preservation represents the history of an underserved individual, community, or population, the act of preservation makes information of said person(s) accessible to the historical record, adding to an otherwise unsung or underrepresented narrative. Archaeologists engaged in cemetery preservation work within historic African American cemeteries participate in interventions based around archaeological research which leads to positive social change within the community where research is taking place (Kirsch, 2018). This type of anthropological research constitutes what Kathryn Kozaitis refers to as “science at the service of humanity” (Kozaitis, 2000:45).

The aggregation of various heritage preservation efforts within similar contexts around the country can serve as a basis for discussions that concern historical inequalities and can set a precedent for future instances of restitution. As more data-driven, ethically sound, and politically responsible research is undertaken in the field, the data and information increase, and are available to bolster narratives surrounding historical inequality. This should ultimately serve to strengthen efforts to confront and reverse these inequalities now and into the future.

2.4 Historical Inequities affecting Minority Populations and Landscapes

In order to develop an anthropological practice which explicitly contributes to restorative justice efforts, and that also confronts historical inequities which have affected the communities in which research takes place, it is important to reconcile with Anthropology’s early contributions to inequity and oppression during our nation’s development (Rylko-Bauer et al., 2006). Anthropology’s colonialist beginnings in the United States are rooted in concepts of scientific racism, anthropometrics, and in federal institutions such as the Bureau of American Ethnography which respectively contributed to the “othering” of non-white populations in North America, and were utilized directly and indirectly to justify their oppression (Lieberman, 2001). This oppression has manifested in many ways, including slavery in the years before emancipation, segregation during the Jim Crow era, and reduced economic opportunity and lower socioeconomic status for non-white populations throughout much of the history of the country.

In the present day, inequalities persist with regards to resource access and quality of life. Proximity to environmentally hazardous spaces is shown to have a strong correlation along racial lines, where hazardous facilities and waste management areas have been shown to be disproportionately situated in areas with concentrated minority populations (Taylor, 2014; Tubert, 2020). Minority populations with little access to economic resources, or which have historically been targets of racially biased housing initiatives such as red lining, have historically had influence the placement of facilities such as hazardous waste management areas, factories, power plants, and incinerators near their homes and schools, and may be indirectly or directly prevented from moving away from such facilities (Taylor, 2014). This phenomenon, termed "environmental racism" is widely considered to have resulted from historical racism and racist policies, and their downstream effects which disproportionately affect African American communities throughout the United States (Taylor, 2014; Tubert, 2020:556). These same factors have direct implications for the state of African American cemeteries in the present day.

3. HISTORICAL CONTEXT

3.1 Growth of African American Populations in the Southern United States.

In 1619, the inception of African slavery in what would become the continental United States began with some 20 African persons landing at Point Comfort, Virginia. The importation of enslaved African persons eventually resulted in some 697,624 enslaved African people inhabiting the United States by 1790, the number approaching almost 4 million by 1860 (Hacker, 2020). In 1860, the African American population in Georgia's piedmont region and, the northern margins of its coastal plain, approached or exceeded half of the total population in some counties (Figure 4). These counties composed Georgia's contribution to the region known as the Black Belt in the American South, a crescent-shaped region comprised of some 200 counties stretching approximately from east Texas to Virginia in which over half of the population was comprised of Black individuals (Raper and Osofsky, 1968; Webster and Bowman, 2008).

These population statistics speak to the substantial space necessary for use as burial grounds for African American people living in the antebellum and postbellum South. After emancipation, an event known historically as the Great Migration resulted in some 3.5 million freed African Americans leaving the South between 1910 and 1970 in favor of northern and midwestern states (Collins, 2020; Rivers et al., 2015). Consequently, many of the cemeteries formerly utilized by these communities have fallen into disuse and are now in relative disrepair as individuals and groups left the South in search of opportunity and relative safety from racial persecution (Collins, 2020; Ozga, 2015; Rivers et al, 2015).

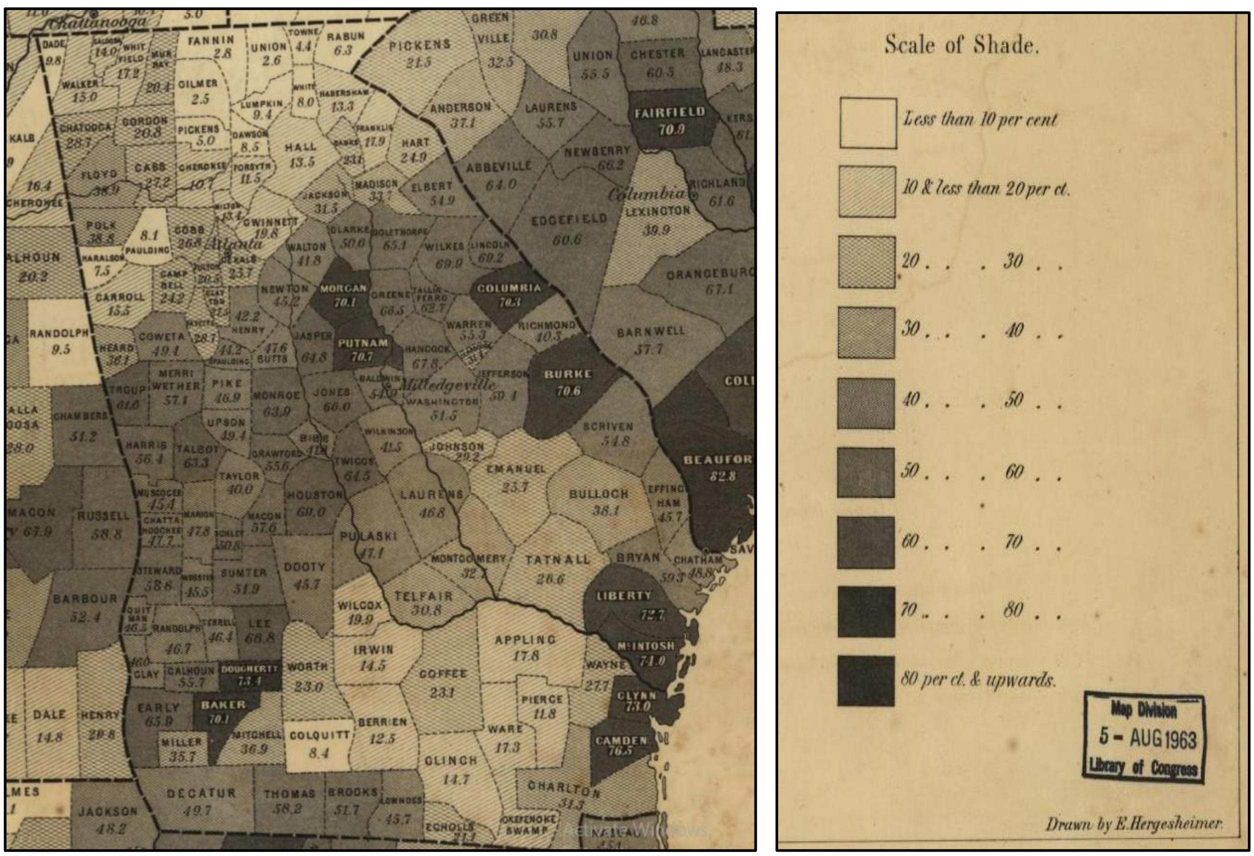

Figure 4: This map highlights percent distributions of enslaved populations relative to free White persons in Georgia by county, 1860. Darker colors indicate increased ratios of African American people to White American people. Image borrowed from the Library of Congress.

3.2 Greene County

White settlers of the region, now known as Greene County, began to arrive in significant numbers around 1783 when lands in these regions were ceded by peoples associated with

Cherokee and Creek Native American tribes under the guise of the dubious Treaty of Augusta (Raper, 1943). Many of these settlers were Revolutionary War soldiers and “pioneers” from Virginia and the Carolinas who were granted land in the region (Raper and Osofsky, 1968; Rice and Williams, 1979). In 1786, Greene County was organized and named for Revolutionary War General Nathaniel Greene. The influx of pioneer farmers into the region led to economic prosperity centered primarily on cotton plantations and mills. The plantation model dominated Greene County, and with these large cotton plantations came slavery, and a massive influx of enslaved African and African American individuals into the region (Raper and Osofsky, 1968; Rice and Williams, 1979). By 1845, the number of African American individuals was nearly 1.6 times the number of White individuals (Rice and Williams, 1979), and by 1860, the US Slave Census map cites Greene county’s enslaved population as comprising 66% of the total population (Figure 6). This represents an approximate 4.5% increase in the ratio of enslaved African American people to free White people in the region from 1845 to 1860. These large population numbers suggest a booming agricultural business and slave trade in the region, predominantly driven by the growth of cotton. It is not surprising, then, that the African American section of the Penfield Cemetery is approximately as large as the White section of the cemetery.

This economic prosperity and population increase eventually gave way to migration of both Black and White individuals and communities out of Greene County over a number of years following the Civil War and emancipation. Although the cotton industry continued to generate money for plantation owners after the war, the arrival of the boll weevil around the turn of the 20th century wreaked havoc on cotton crops, leading to extreme deflation in land values, and to the eventual outflux of large plantation owners from Greene County when the land would no longer support large-scale agriculture (Raper and Osofsky, 1968). This resulted in many of the white plantation owners who had made their fortunes in Greene County through planting and harvesting cotton leaving the area and letting their fields fallow. This in turn, resulted in reduced opportunity for work and income in the region (Raper and Osofsky, 1968; Rice and Williams, 1979). Following the trends in cotton production, the African American population in Greene County saw an increase of approximately 33% from 1860 through 1920, followed by a sharp decline when approximately 41% of Greene Counties African American community left the region (Raper and Osofsky, 1968). Free Black people began steadily leaving Greene County in the years after 1920, potentially following trends of other free Blacks who largely migrated north and northwest during the period known as the Great Migration (Collins, 2020; Glover et al., 2012; Harrison and Marks, 1991; Rice and Williams, 1979; Rivers et al., 2015). This period from approximately 1910 to 1970 is predominantly characterized by the migration of approximately 3.5 million African American people from the South to northern and midwestern states over the course of some seventy to eighty years (Collins, 2020; Rivers et al., 2015). The perceived opportunities afforded by northern states economically, politically, and socially appear to have influenced many free African American individuals, families, and entire communities to undertake the journey north or northwest. As individuals and families left Greene County, many of their cemeteries inevitably fell to disuse, and presumably, many still remain effectively unidentified.

3.3 The African American Section of the Penfield Cemetery

The African American section of the Penfield Cemetery possesses many of the attributes characteristic of rural, historic African American cemeteries that make them difficult to identify in the present. These attributes are cast in sharp relief when compared to the historically White section of the spatially and racially segregated Penfield Cemetery. White and African American sections of the cemetery rest side-by-side and display variations in characteristics which include topographic variation, variations in the type and density of vegetation, the extent of landscaping, accessibility between the respective areas, as well as in the style and density of grave markers contained within (Figure 5).

Figure 5 Left: The well-manicured White section of the Penfield Cemetery. Right: The state of Penfield’s Black section in January of 2023. The dividing wall is visible running horizontally in the approximate center of the photograph at the right.

Segregated by race since its inception, racial divisions within the Penfield Cemetery were literally cemented in the 1940s when a brick-and-mortar wall was constructed which partitioned the white section from the African American section, leaving no point of access between the two (personal communication with Doug Thompson, 2022. Historical imagery). Evidence suggests that the partition, along with timber planting along Penfield’s eastern border, played respective roles in reducing access to Penfield's African American section (Figure 6). This in turn may have discouraged maintenance and upkeep of the area situated beyond the wall. Historical imagery of this area appears to confirm this sequence of events through the apparent increased tree density in the years after 1942, potentially correlated with the dense group of planted trees along the eastern border of the cemetery (Figure 6). The planted timber, which appears in historical imagery between the years of 1942 and 1966, eventually overtook the cart path which once provided access to the African American section of the cemetery. In aerial imagery from 1966, the path at the eastern border appears almost completely obscured by tree cover (Figure 6).

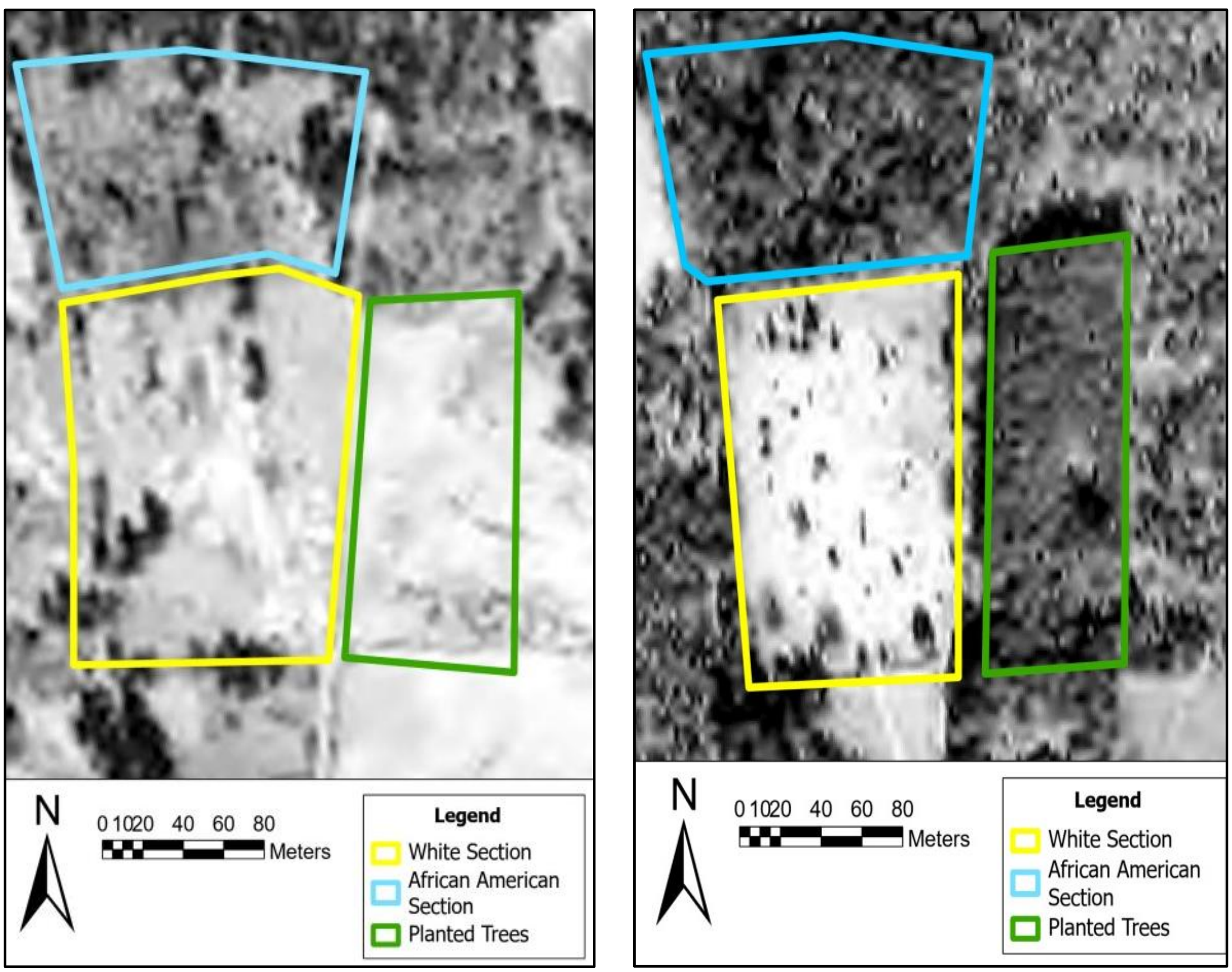

Figure 6: Historical imagery of the Penfield Cemetery from March 1942 (left) and December 1966 (right). Notice the apparent difference in tree cover within the African American section of the cemetery (blue outline) in 1966. Both images were taken in winter months.

At present, Penfield's African American section may not be immediately recognizable as a cemetery save for the relatively sparse markers, scattered field stones, and depressions in the earth that lie hidden beneath a bed of leaves and a dense forest canopy. Records for the distribution, the orientation, and identity of those buried at Penfield are sparse, or are currently not publicly accessible. For this reason, remote sensing archaeological methods are well suited to begin to answer initial questions about the African American portion of the Penfield community and the people interred in this cemetery.

4. CONDUCTING RESEARCH WITHIN AFRICAN AMERICAN SPACES

Ruth Little describes an old graveyard as a "cultural encyclopedia" (Little, 1998:3). Lynn Rainville (2008) further notes the uniqueness of cemeteries as "deliberately placed" examples of material culture that are "meant to survive," and thus are uniquely suitable for studying past cultures (Rainville, 2008:2). Genealogical information, cultural traditions, socio-economic standing, trade connections, spiritual beliefs, and change over time are some of the informational categories available to researchers working within cemetery contexts. In instances where grave markers with legible inscriptions are present, genealogical information may be garnered directly from monuments. However, in the case of many historic, rural cemeteries, headstones inscribed with information about the deceased individual may not exist. In historic African American cemeteries, and particularly those which pre-date emancipation, a multitude of factors restricted access to inscribed "formal" headstones. Limited access to monetary resources meant that engraved headstones were often unavailable to enslaved or poor individuals. Racist laws barring literacy of enslaved people further restricted the ability of enslaved individuals to engrave their own headstones for fear of retribution by their enslavers. This would prevent literate people from exposing themselves as literate through the engraving of headstones (Rainville, 2009). The time required to quarry, hew, and engrave a headstone would further act as a barrier to the use of formal headstones in pre-emancipation African

American cemeteries. Despite the reduced access to direct genealogical information in these instances, the material remains nested within historic African American graveyards and cemeteries offer rich insights into the lives and culture of past populations (Glover et al., 2012; Jamieson, 1995; Rainville, 2016). Unengraved headstones, floral grave markers, grave goods, and landscapes common to early African American cemeteries are frequently interpreted as being improvised products of the economic standing of 19th and early 20th century African American individuals (Rainville, 2016). Alternatively, researchers have interpreted these implements as continuations of African traditions brought over during the slave trade (Brooks, 2011:183; Morrow, 2002). In this way, material culture has been utilized to reveal ways in which past people may have exercised agency in the practice of traditional burial rites under otherwise oppressive institutions. The material remains common to rural African American cemeteries are briefly discussed below, as they relate to the Penfield Cemetery and wider cultural traditions.

4.1 Burial Customs in Rural African American Cemeteries

The variation in (or absence of) grave markers within many historic rural and African American cemeteries, as well as their placement in the landscape which has frequently been described as marginal and improvised, appear to reflect the oppressive and racist policies perpetuated by slavery. However, the aforementioned characteristics which often stand in contrast to those of white cemeteries may not solely reflect socio-economic status in all instances, and the ability of enslaved communities to practice their own mortuary traditions in cemetery contexts must be considered when conducting research in these spaces. Folk customs derived in part from African traditions as well as from the intersection of African heritage and Christian influence may be reflected in the informal and seemingly improvised markers and grave decorations within historic cemeteries (Jamieson, 1995; Rainville, 2016), as well as their frequent placement in wooded or overgrown spaces. Christina Brooks notes the tree and plant-filled landscape of the Bellefield / Marietta Cemetery in Georgetown SC as intentional, citing West African BaKongo traditions, where “trees are thought to provide a map to guide spirits to their final destination” (Brooks, 2011:183; Morrow, 2002). David R. Roediger suggests the incorporation of West African traditions in mortuary practice during funeral proceedings of enslaved persons, specifically citing the apparent intersection of traditional African customs with Christian burial rights with regards to east / west burial orientation. Easily mistaken for a Christian custom, African-inspired burials were “...frequently dug along an East-West axis” interpreted by David Roediger as being done so intentionally “by slaves who were careful not to violate the West African strictures against burying a corpse ‘crossways in the world’ “ (Roediger 1981:171). This is an interesting intersection of convergent customs with different origins visible in cemetery landscapes. Burial customs apparently derivative of earlier African traditions have been recognized in many African American cemeteries. These include the use of field stones and plants such as yucca as grave markers, as well as the presence of household items such as glassware or whiteware as grave goods (Brooks, 2011; Jamieson, 2009; Morrow, 2002; Richards, 2014). Connections with the spiritual significance of water in West African traditions have been correlated with the frequent occurrence of receptacles for water to be used as grave goods in historic African American cemeteries (see discussion below), and yucca in cemeteries in the United States has been linked to the use of *Dracaena arborea* as a grave marker in West Africa, where it is a native plant. In this context, these spiny plants have been interpreted by scholars working in African American cemetery contexts as implements which restricted the movement of spirits from the cemetery (Rainville, 2019; Richards, 2014).

4.2 Headstones in Cemeteries

Headstones are capable of revealing valuable information on cultural change and societal preference over time (Dethlefsen and Deetz, 1966; Little, 1984). The well-known chronology from the winged death’s head, to cherub, to willow and urn motifs in 18th - 19th century New England provides a strong precedent for the use of grave markers to discuss evolving preferences and burial customs over time (Dethlefsen and Deetz, 1966). The ability to view stylistic change over time in this way relies on associations of design motifs with dates of death engraved into these headstones, contextualized through the well-documented histories of the literate cultures which produced them.

Rural cemeteries however, and notably those African American cemeteries which span antebellum and postbellum periods, often contain a wide variation in grave marker morphology, resulting in difficulty creating distinct chronologies for cemeteries of this era (Davidson & Mainfort, 2011). Wooden implements, shaped or unshaped field stones, unmarked obelisks, unengraved stone slabs, hand-engraved stones, shell, improvised metal implements, along with perennial plants such as yucca, daffodils, periwinkle, and cedar, and apparent unmarked grave plots are all common in rural African American cemeteries (Brooks, 2011; Little, 1984), and can be found within Penfield's African American section. Changes in access to freedom of choice as well as access to economic resources may account for some variation, as well as for the transition from improvised, unmarked, or informal fieldstones to more formally cut and engraved headstones and metal memorial plaques over time. This suggests the integration of professional funeral services into burial rights and traditions as resources became available (Smith, 2010). Ruth Little cites socio-economic status and access to resources as the main driver for this variation (Little, 1984). If this were so, it may be rather easy to develop broad chronologies in cemeteries which span periods of enslavement and emancipation yet predominantly contain burials which lack formal markers. Socioeconomic status, however, may not be the primary driver for the use of improvised or nonexistent markers in all instances, and Christina Brooks suggests that emphasis was often placed on the transitioning of the deceased into the afterlife through the use of symbolic grave goods such as glass or ceramic vessels and personal effects, or less permanent markers such as plants at the burial site in lieu of the memorialization of the deceased through more permanent markers (Brooks, 2011).

The Penfield Cemetery itself contains a wide variety of markers. Engraved “formal” headstones are found alongside more rudely hewn stones with engravings. Unengraved stones which appear to have undergone some shaping or modification are also found within the cemetery, and unmarked, apparently unmodified fieldstones are found throughout. Fieldstones are sometimes associated with depressions in the earth with clear rows, and occasionally exist with no other context suggesting a potential burial. Metal plaques are found in Penfield, concentrated predominantly in the eastern margins of the cemetery area, and in many instances, depressions occur with no visible marker (Figure 7).

Figure 7: Examples of variation in grave markers with Penfield’s African American section.

4.3 Flora

Daffodils, yucca plants, cedar trees, and flowering ground cover plants occur within Penfield's African American section. These represent examples of plants which are frequently and intentionally planted within African American cemetery contexts as burial markers (Rainville, 2019). The variation in apparent floral markers within Penfield may in some instances be indicative of continuations of West African mortuary traditions, or in others, may simply represent ad hoc implementations utilized in the moment.

4.4 Grave Goods

A multitude of potential interpretations exist for the broken ceramic or glass containers associated with burials. Practically, vessels may be cracked in order to deter thieves from stealing them. More spiritually oriented interpretations link this practice to African traditions concerning the symbolic breaking of the vessel or object which may refer to the breaking of ties with the living and spiritual world, or the breaking of the "chain of death within the community" (Brooks, 2011; Jamieson, 1995). Household wares have been further interpreted as offerings to the deceased so that they may have their needs met in the afterlife (Brooks, 2011; Jamieson, 1995; Rainville, 2016). Grave goods found in historic African American cemeteries have also been linked to the occurrence of water as a boundary between the world of the living and that of the dead. The frequent occurrence of water receptacles as grave goods in African American cemeteries has been correlated with spiritual beliefs surrounding water (Jamieson, 1995; Smith, Suzanne E. 2010). Broken glass containers have been associated with burials within the Penfield Cemetery (Figure 8), however interpretations as to their cultural significance within the context of Penfield have yet to be explored.

Figure 8: Examples of broken glass containers associated with grave markers at Penfield. Amethyst-tinted glass suggests that these vessels were produced between 1870 and 1915, the approximate dates for the use of manganese as a decoloring agent in glass production in the United States. Manganese inclusions result in the amethyst color during prolonged exposure to

The variation in mortuary tradition common to rural, historic African American cemeteries, while seemingly incomplete due to deterioration, and potentially lacking in well-defined chronologies, can be alternatively viewed as a rich source of cultural information when viewed through the right lens. This reinforces the need for community engagement, African American voices, and those of scholars versed in African American studies to help tease out the nuanced information available to research within these spaces.

5. ORIGINS OF RESEARCH AT PENFIELD

The recent impetus for archaeological research which led to my own involvement with the Penfield Cemetery preservation effort was initiated through a web of connections and collaborations between Greene County community members, non-profit historical organizations, and academic institutions.

Macky Alston, a documentarian and descendent of the first Mercer University principal Billington Sanders (buried in the white section of the Penfield Cemetery), effectively re-discovered the location of the African American section at Penfield in 2020 while engaging in documentary research surrounding his family's ties to slavery in antebellum Greene County. This information was relayed to Mamie Hillman, a long time Greene County resident and owner of the Greene County African American Heritage Museum. Parallel to Macky and Mamie's efforts to document Penfield was the work by then Mercer University graduate student Summer Perritt, who ventured into the cemetery as a part of her thesis research. Upon realizing the significance of the space, she brought its existence to the attention of Dr. Doug Thompson of Mercer's Spencer B King, Jr. Center for Southern Studies. As students and faculty from Mercer University began to recognize the significance of Penfield to the history of African American people in this region, other collaborators became involved, including the Historic Rural Churches of Georgia non-profit group (HRC), whose members had spent considerable time researching and documenting the Penfield Baptist Church's role in early Georgia history.

Through a series of connections between Sonny Seals of the HRC, Spencer Roberts of the Pitts Theology Center at Emory University, Doug Thompson and Mamie Hillman, the need for archaeological research at the Penfield cemetery was discussed and was related to Dr. Jeffrey Glover in the Department of Anthropology at Georgia State University. Initial efforts to locate unmarked graves within Penfield were discussed with Doug Thompson of Mercer University and Bigman Geophysical, a privately-owned geophysical testing firm where I worked while writing this thesis. A large meeting in June of 2022 was later held at Penfield in which a number of collaborators and interested parties gathered to discuss revitalization efforts. It was during this meeting that Dr. Jeffrey Glover realized the potential to turn research at Penfield into a thesis project, and the first meeting was subsequently held at Georgia State University to discuss the feasibility of this initiative. Due to the cemetery's connection to the nearby Penfield Baptist Church, the Historic Rural Churches of Georgia (HRC) non-profit became involved with the project. Collaborations between the HRC and Emory University to create a digital database of Georgia's rural churches led to an internship with Emory University with the goal of digitizing the results of the research at Penfield and integrating it into HRC and Emory's respective digital heritage databases. A Memorandum of Agreement was drafted between Emory University and Georgia State University which outlined goals and responsibilities for research at Penfield. In this way, the Penfield Cemetery project began centrally in Greene County, and has reached outward to encompass a wide resource base of community members and professionals who have come together in collaboration to protect this sacred cultural resource.

5.1 Scope of Work

Research conducted for my thesis within the historic Penfield Cemetery in Greene County, GA includes efforts to delineate its boundaries, as well as to map the approximate distribution of individual burials through the use of well-established archaeological protocols that utilize Ground-Penetrating Radar (GPR) alongside Geographic Information Systems (GIS) in order to map, study, and visualize the nature of underserved historic cemeteries, the communities which they served in the past, and which they continue to serve in the present (Bevan, 2001; Bigman, 2014; Conyers, 2013; Glover et al., 2010; Spera et al., 2022). Drawing on theories of engaged anthropology and praxis, the research on which this thesis is based involves local community members and a multitude of other collaborators with various backgrounds in order to conduct and interpret the results of the archaeological fieldwork, as well as to help guide interpretations and the dissemination of data.

In conducting a full-coverage GPR investigation of the African American section of the Penfield Cemetery, questions regarding locations, number, and density of buried individuals can be addressed. Further, anthropological questions surrounding the chronology of use within the cemetery, as well as changes in burial patterns and treatment over time can begin to be identified, providing access to presently uncertain information regarding the history of the people interred therein. The rich data generated from a geophysical investigation, which includes the entire cemetery area in lieu of a representative sample, allows for more robust questions to be addressed both within and outside the scope of this thesis, facilitating engagement with Penfield's history as further questions are developed by and alongside the community, the general public, and future researchers.

6. METHODS

Ground penetrating radar has a robust history of use in identifying unmarked burials (Bigman, 2014; Bevan, 1991; Honerkamp and Crook, 2012; Khan, 2022; Patch, 2009). The nature of GPR to be relatively non-destructive while resulting in a three-dimensional dataset which can offer spatial and depth information pertaining to various properties of the subsurface makes it one of the more informative geophysical techniques for archaeology. However, GPR relies on a number of tangible and intangible physical properties in order to generate reliable data which can be accurately interpreted in archaeological contexts. In this chapter, I outline the methods used to acquire data at the Penfield Cemetery, which presented many challenges for the application of GPR.

6.1 Overview of GPR

GPR operates by sending pulses of electromagnetic (EM) radiation into the ground via a transmitting antenna. When these pulses encounter a discontinuity or disturbance in the subsurface, some of that energy is reflected toward the surface, where it is recorded by a receiving antenna (Annan, 2009; Cassidy, 2009; Conyers, 2012). Pulse Radar antennas produce these pulses at a pre-set central frequency. The frequencies appropriate for archaeological applications range from approximately 100 MHz to 1000 MHz. Lower frequencies in this spectrum have longer wavelengths and thus worse resolution but can investigate deeper into the subsurface. Higher frequency GPR waves have shorter wavelengths and thus are higher resolution, can resolve smaller objects, but are limited in depth due to faster absorption rates.

Reflections of GPR pulses are ultimately due to sudden changes in a wave's velocity as it encounters some discontinuity in the soil matrix (Annan, 2009; Bigman, 2018; Conyers, 2012). Subsurface features which can result in a sudden velocity change and thus a reflection event include buried natural objects such as rocks or tree roots as well as cultural objects like caskets or pipes. Additionally, soil discontinuities such as stratigraphic interfaces and other compositional changes may result in some energy being reflected, especially when these interfaces or changes are characterized by differential water retention or air space between layers. Cavities where air or water can become trapped can result in velocity changes and reflection events in GPR (Bigman, 2018; Conyers, 2012). This is due to the nature of a wave's velocity being significantly altered when encountering water or air. This phenomenon is discussed further below.

An EM wave's velocity in any given material is primarily influenced by that material's dielectric permittivity (Bigman, 2018). Dielectric permittivity is a measure of the capacity of an electric field to displace the bound electric charges in a given material (Cassidy, 2009). A material with a higher density of bound electric charges will result in slower propagation of an EM wave through that material due to the greater difficulty in the waves ability to polarize and displace those bound charges. Thus, there is an inverse relationship with dielectric permittivity values and EM wave velocity. Air and water lie at opposite poles of this metric where air or free space is represented by a value of 1 (low density of bound electrical charges, very fast velocity), and water is represented by a value of 81 (relatively high density of bound electrical charges, very slow velocity). All other naturally occurring materials lie somewhere within this scale. These values are known as a material's *Relative Dielectric Permittivity* (RDP) since the RDP of all materials are provided as a function of that material's permittivity in relation to the permittivity of free space (Figure 9). Given this, an EM wave will experience a significant reduction in speed when it encounters water from almost any other surrounding material.

$$\varepsilon_r = \text{permittivity of the material } (\varepsilon) / \text{permittivity of free space or vacuum } (\varepsilon_0)$$

Figure 9: Relative Permittivity / Dielectric Constant Equation (Cassidy, 2009).

Large changes in wave velocity (or RDP) will often result in a relatively high-amplitude reflection at soil / water boundaries due to the high RDP of water, as well as at soil / air boundaries due to the relatively low RDP of air. This means that an electromagnetic wave is likely to experience reduced velocity when encountering water, and increased velocity when encountering air or free space. The amount of energy reflected in a given situation is characterized by the *reflection coefficient.* This is a ratio of the wave's velocity in the overlaying compared to the wave's velocity in the underlaying material. The strength of a reflection event due to differences in velocity between two layers can be estimated by the reflection coefficient formula. The reflection coefficient can be expressed as a function of the respective velocities on each side of an interface, is given by the formula: $R = \frac{A_r}{A_i} = \frac{v_2 - v_1}{v_2 + v_1}$ where v1 is the wave's velocity in the overlaying medium, and v2 is the velocity of the wave in the secondary medium. A larger difference between the two will result in a larger value for R, and a stronger or *higher amplitude* reflection.

Another major contributing factor to the ability of GPR to generate usable data is electrical conductivity. Conductivity refers to the ability of a material to pass electric charges under the influence of an applied electric field, i.e., the field generated by a GPR antenna (Cassidy, 2009). In a conductive material, energy loss occurs in the form of heat as ionic molecules move and collide under the presence of an applied electric field. With regards to GPR, there is an inverse relationship between penetration depth and conductivity, so that a high conductivity medium effectively serves to reduce the depth of penetration of the radar signal. The conductivity in soils is predominantly affected by the presence of water, or more specifically, the presence of dissolved ions in water which increases its conductivity. The presence of water containing dissolved ions will generally reduce penetration depth as the energy loss due to electrical conductivity reduces the amount of energy reflected to the receiving antenna. This loss of energy is referred to in GPR literature as “attenuation.” Signal attenuation and thus depth of penetration in GPR investigations are further affected by the frequency of the GPR signal. Rates of attenuation tend to increase with frequency so that a higher frequency GPR signal will tend to attenuate at relatively shallower depths than a lower frequency GPR signal (Cassidy, 2009; Conyers, 2006).

Clay is typically considered a poor medium with regards to GPR signal penetration due to its relatively small particle size and therefore high surface area and ability to retain water (Annan, 2009; Conyers, 2006). This has implications for this investigation, as the soil composition in Georgia’s piedmont region tends to be clay rich, and therefore can reduce signal penetration to relatively shallow depths, especially under the presence of water. In order to address potential issues of signal attenuation before the target depth in this investigation (approximately 2 meters and above for investigations in most historic cemeteries), a dual frequency antenna chosen which resulted in datasets from low and high frequency antenna specifically. It was hoped that the dataset generated by the high frequency antenna would result in greater resolution of shallow features, while the dataset generated by the low frequency antenna would act as a supplement in the event that signal attenuation prevented the high frequency signal from penetration to target depths within the Area of Investigation (AOI).

Electrical conductivity and dielectric permittivity are the predominant factors affecting the radar wave's ability to propagate through a medium, and variations in dielectric permittivity between interfaces (largely determined by variations in water saturation) is the major factor affecting the strength of reflection of the GPR wave (Annan, 2009; Conyers, 2012). In addition to having a strong effect on the generation of reflections in GPR waves, dielectric permittivity is an essential component for estimating depth within GPR investigations. This is because depth is calculated through determining the time it takes a wave to leave the transmitting antenna, reflect off of a buried feature, and return to the receiving antenna (known as two-way travel time). Upon estimating the dielectric value of the soil matrix, the velocity of the wave can be estimated. This velocity along with the two-way travel time can be converted to depth for a particular subsurface object, horizon, or interface where a reflection event has been recorded. The to estimate depth of targets sets GPR apart from other near surface geophysical methods and is a major factor in the ability of GPR data to be represented as a 3D volume.

Most terrestrial GPR antennae are configured to create pulses of electromagnetic energy as the antenna is pushed forward along the ground surface. Pulses are generated by a survey wheel that causes the antenna to generate a radar pulse at regular intervals based on distance traveled. The survey wheel should turn at a regular, constant speed in order to generate consistent pulses from the antenna. In certain circumstances, ground conditions on site may result in wheel “slippage” where the survey wheel fails to turn at a consistent rate, or rough conditions may result in loss of contact between the antenna and the ground surface, respectively. Either of these phenomena can result in loss of data or “noisy” data which may result in unclear or discontinuous responses and might hinder interpretation. Slippery leaf beds, uneven ground, and debris such as loose rocks or branches all may result in either or both of these respective phenomena. This means that data collected in a manicured field may result in higher resolution data where consistent rotation of the survey wheel and consistent coupling of the antenna to the ground are achieved. Conversely, data collected in a dense forest may be “noisier” due to inconsistent speeds, and the necessity to frequently lift, or decouple, the antenna from the ground.

6.2 Grave Reflections in GPR Data

Historic burials may exhibit one or more properties which can result in a reflection event when encountered by a GPR wave (Berezowski et al., 2021; Conyers, 2006). The difference between the native soil and the relatively loose backfill at the interface of the grave shaft and the actual burial may result in a reflection due to the void space or differential water retention within the unconsolidated soil (Annan, 2009; Bigman, 2014; Conyers, 2006). An in-tact casket may result in a reflection event, as common casket materials are likely to have different dielectric properties to soil, thus resulting in a reflection. Further, a void space within the burial where the soil has yet to consolidate, commonly over the chest cavity of the individual, may result in a strong reflection due to the nature of air or void space to produce a strong reflection (Conyers, 2012). The efficacy of GPR relies largely on the physical properties of the ground, both at the surface level, and in the buried soil matrix. Ideal conditions for GPR include a ground surface that allows for consistent coupling of the radar to the ground (Annan, 2009), targets which contrast sufficiently with the surrounding soil matrix that they generate strong reflections (Conyers, 2012), and soil properties which allow for signal penetration to the depth at which potential targets are thought to be buried (Daniel, 2007). A ground surface which is highly irregular or contains obstructions which lead to the decoupling of the radar may result in inconsistencies in the radar signal as air waves are generated with the lifting and bouncing of the antenna. In these instances, reflections generated from the frequent decoupling or lifting of the antenna may result in "noisy" data that may obstruct signatures generated from buried features of interest. Another effect of the decoupling of the antenna from the ground surface is a series of reflections that appear as horizontal bands or *streaks* across the section of the profile where the antenna was decoupled from the ground during data collection (Figure 10). This streaking is due to a large air gap which affects penetration into the ground surface and is generally visible from the top of the profile to the point where attenuation occurs.

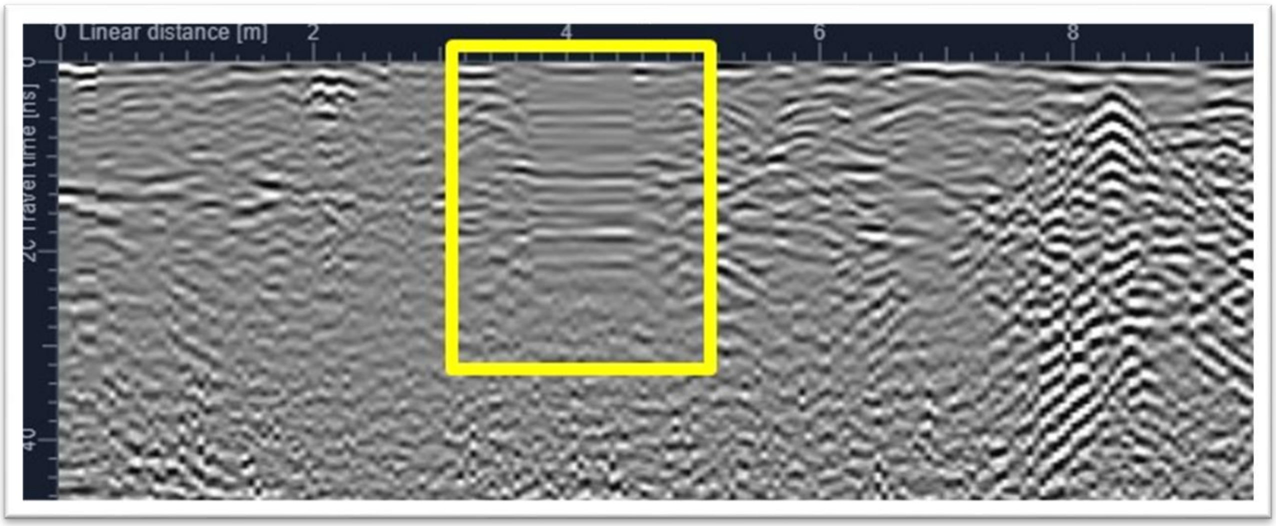

Figure 10: Instance of streaking from inconsistent rotation of the survey wheel during data collection.

6.3 Data Collection

GPR data were collected over the course of three field deployments, which were generally undertaken after a section of the cemetery was cleared of large fallen debris. This occurred in three approximate sections, a western, central, and eastern section, respectively. Volunteer days, which predominantly focused on the cutting and clearing of large fallen trees, depositing debris at the margins of the cemetery, and exposing covered grave markers, were necessary for and instrumental in providing access for the GPR throughout the cemetery (Figure 11). Much of Penfield's African American section was not passable for the GPR cart at the outset of research, so data collection naturally followed volunteer cleanup days. As a new section was cleared of trees and debris, data could be gathered there. Volunteer efforts involved the collaboration between representatives from various academic institutions including faculty and students, local community members, political leaders, and members of the Penfield descent community representing both of Penfield's respective cemeteries. Volunteers arrived at Penfield in cold winter rain as well as in the hot summer sun to engage in beautification efforts within the cemetery space.

Figure 11: Volunteers Spencer Roberts, Jesse Latimer, and Walter Boswell removing fallen trees at Penfield.

Many GPR investigations within historic cemeteries rely on square or rectangular grids within which data is collected. Grids are placed in areas which are designated as unknowns, and which appear somewhat ideal for data collection (Khan, 2022; Patch, 2009). This oftentimes leads to representative samples of the entire area being gathered, which can then be extrapolated to estimate densities within cemeteries. However, in the case of the Penfield Cemetery, the density of trees and underbrush, as well as the undulating landscape, limited the use of formal grids. The survey design for this investigation was based on a full-coverage model, with the intent of collecting data throughout the entire presumed cemetery area. Due to the impracticality of multiple grids for this model, I opted for an approach which followed the natural topography and barriers contained within the landscape. This resulted in transects at semi-regular spacing but of variable length, the length of each line being dependent on natural barriers such as fallen trees, large holes from the root balls of fallen trees, fenced boundaries of the cemetery, and inclines which acted as natural line breaks (Figure 12).

Figure 12: Grey lines indicate individual transects. Yellow polygons represent areas where fallen trees and debris prevented data collection.

There are a number of ways to calculate an appropriate transect spacing when investigating historic sites with GPR (Ristic et al., 2020) The most common way is to estimate the expected target size and expected distance between targets, and then evaluate an appropriate transect spacing that would encourage both multiple reflections recorded from each target as well as results between targets so individual features can be resolved and differentiated (Ristic et al., 2020). Since the length of presumed burials is expected to be approximately 2.0 meters, and burials are expected to be separated by more than 0.5 meters, a transect spacing of 0.5 meters was chosen. This is consistent with practices identified as appropriate by other researchers working in the southeast (for example see Patch, 2009).

Another option to ensure sufficient coverage is to calculate the wavelength of the GPR wave for the chosen antenna in a given medium and verify that the transect spacing is less than 4 times the wavelength (Luo et al., 2019). The dielectric permittivity values at the Penfield Cemetery ranged from approximately 7.5-10.5, with a typical wave velocity of 0,1 m/ns across the site. Thus, the wavelength of the 700 MHz antenna is calculated at 0.143 m. According to Luo et al.'s (2019) discussion, the maximum transect spacing in this context for sufficient coverage would be 0.582 meters which is satisfied by the spacing of 0.5 meters used in the majority of this investigation. Transect spacings greater than 0.5 meters were required under limited circumstances due to standing and fallen trees and other landscape features which obstructed data acquisition. It was decided not to cross fallen trees with the GPR during data collection, instead opting to terminate lines at these natural boundaries (Figure 13). This resulted in less "noise" due to the frequent lifting of the antenna, as well as less strain on the equipment.

A Leica DS2000 dual-frequency pulsed GPR system was used to conduct this investigation (Figure 13). This instrument contains two antennae with center frequencies of 250MHz on the low end of the spectrum and 700MHz on the high end. This instrument was chosen due to the radar's ability to generate two datasets with each pass of the system, one from the low-frequency antenna and one from the high-frequency antenna. Radar pulses were generated from each antenna as the unit was pushed in a forward direction along the ground surface, and these pulses were generated based on the rotation of a survey wheel which was calibrated to generate a pulse for every 2.38 cm of forward travel, calibrated to conditions on site. For this investigation, data generated from the 700MHz antenna was utilized for interpretations, as usable data was available below 2 meters, and the resolution from the high-frequency antenna resulted in radargrams which were easier to interpret than those generated by the 250MHz antenna. The time window was set to 80 nanoseconds, which provided an effective depth range of 4 meters throughout the AOI. The sampling rate was set to record 512 samples per scan which is appropriate for a time window of 80 nanoseconds.

Figure 13: Sean McConnel ends a transect near a group of large fallen trees which remained in situ at the time this thesis was submitted.

An RTK-level GPS system was integrated with the GPR antenna allowing for the real-time corrected positioning of transects during acquisition. A pair of Emlid RS2 multi-band GPS receivers were used to accomplish this. One antenna acted as a stationary base which remained in place during the course of the survey. The second antenna was coupled to the GPR, receiving real-time corrections from the base station, allowing for sub-meter positioning accuracy. This allowed for the collection of transects of indeterminate length, without the need to adhere to a standard grid. In order to generate data which were as spatially accurate as possible, most data used in this thesis were collected during winter and spring months, when the tree canopy was sparse, allowing for the best possible sky view, and thus greater accuracy for the GPS unit. Given the heavy tree canopy, spatial accuracy was variable throughout the site, with sub-meter positioning accuracy in less dense areas, and reduced accuracy in others.

A pedestrian survey was undertaken in order to map visible indicators of graves throughout the Penfield Cemetery. Visible features indicative of graves included engraved formal headstones, metal memorial plaques, unengraved headstones, apparently unmodified field stones, and depressions in the earth that approximated the orientation and size of a human burial. Features were mapped in with a base/rover pair of Emlid RS2 GPS units and were imported into ArcGIS Pro software in order to develop an initial GIS for the cemetery.

6.4 Filtering Parameters

Radargrams in this investigation were subjected to a time-zero correction, where the software detects the ground surface as the first positive reflection within the dataset. This step accounts for reflections generated between the air gap between the antenna and the ground surface and adjusts radargrams to display the ground surface at a depth of zero. A bandpass filter was applied to cut off both high-frequency interference (data was cut off above 800MHz), and low-frequency interference (data was cut off below 400MHz) within the dataset. This is done in an attempt to highlight data just above and below the center frequency of the antenna, which was 700MHz. A background removal filter was applied with an appropriate window to remove horizontal banding, but avoid filtering “planar” signatures, or short horizontal signatures of interest. Data were then normalized to their maximum amplitude values, and a gain curve was applied whereby an energy decay curve was calculated for each profile, and an inverse gain was applied in order to generate consistent amplitudes across the profile, despite signal decay with depth of penetration. This energy decay curve retains relative amplitude information within profiles so that contrast between high and low amplitude reflections is maintained, and data can be analyzed.

A separate set of processes was created in order to generate time slices. Profiles were treated to a data migration using a velocity found using the hyperbola fitting method. Migration effectively removes tails from hyperbolic signatures, and concentrates reflections seen in profile to the apex of their signal. this results in a better approximation of the actual position and depth of the reflection by removing the tails of hyperbolic signatures and concentrating the hyperbolic responses to a point. An envelope filter known as a Hilbert transform was finally applied which takes the absolute value of negative and positive amplitudes within each reflection, creating a reflection profile in which only positive signals were analyzed. This is a common step in the creation of time slices with GPR data. The second set of processed profiles was utilized for creating time slices, whereas the first set was left unmigrated to allow consideration of hyperbolic responses during profile analysis in the 3D environment.

Time slices (amplitude maps) were created with 8 cm cell sizes exposed to a 1.5 m search radius using the Kriging method. A plan-view map was created for every 10 cm of depth, averaging 30 cm above and below for each slice. Finally, signatures were treated to a 5 x 5 low-pass filter to smooth features and better represent their shape in the ground.

6.5 Interpretations

Interpretations of GPR data were predominantly made using 2-dimensional radargrams which were produced using Geolitix, a third-party, cloud-based platform for processing and analyzing ground-penetrating radar data. Signatures were identified which appeared consistent with expectations for burials in GPR data (Conyers, 2006; Bigman, 2014; Jones, G. 2008; Martin and Everett, 2023). These were given a single point at the approximate top / center of the reflection (Figure 14). These points were spatially referenced in Geolitix and exported as a .CSV file for integration into GIS.

Figure 14: This image highlights the method for spatially plotting the locations of signatures interpreted as burials. I generated points at the tops of signatures featured on 2-Dimensional profiles. These points were spatially referenced automatically in Geolitix GPR software.

Once plotted in GIS software, the interpretive step of analyzing individual points or groups of points as belonging to respective burials could begin. In order to estimate the length of an adult burial, polygons were generated within ArcGIS Pro, which were six feet in length and 3 feet in width. This was thought to estimate a typical adult burial and was confirmed by measuring the distance of two points which were taken lengthwise along a known burial at Penfield (Figure 15).

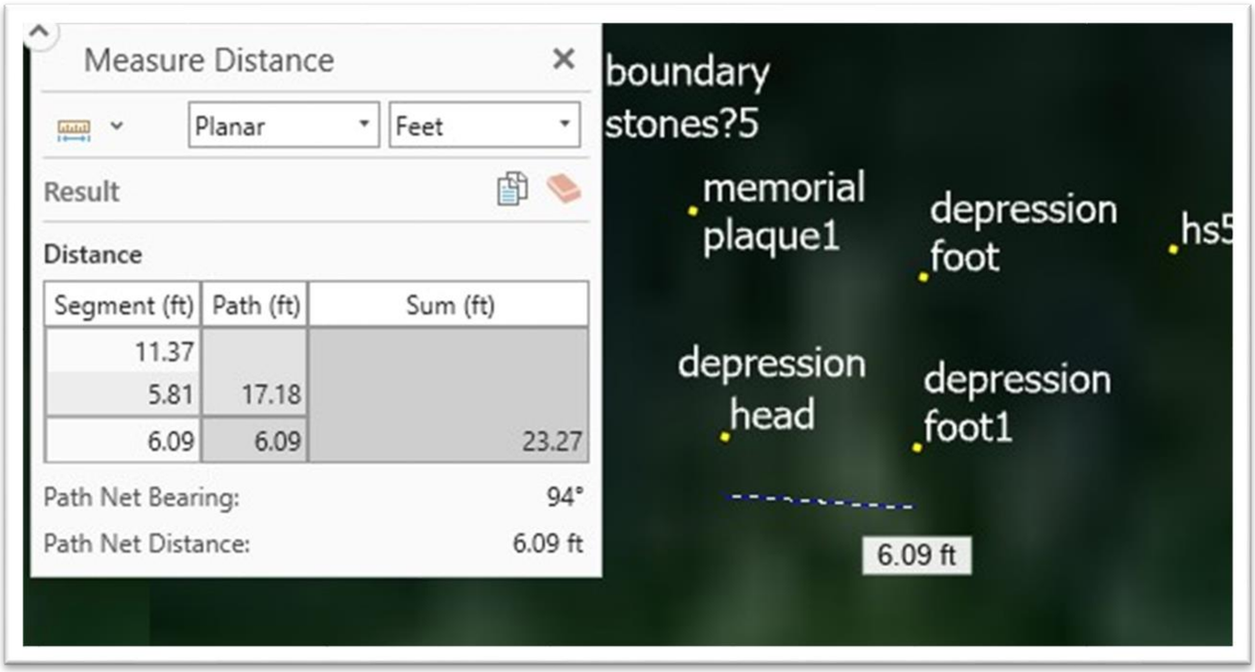

Figure 15: This image highlights GPS points at the head and foot of a visible depression. Features like these were used as a metric for the size of polygons which would represent individual burials.

6.4 Classification of Positive Signatures

Most usable data were generated from approximately 0.0 - 2.5 meters below surface, which represents an appropriate depth for investigating human burials (Bigman, 2014; Conyers, 2004). The wide variation of signatures in this dataset with regards to amplitude, shape, size, and depth indicates a complex subsurface with reflections generated from anthropogenic as well as natural buried features and disturbances.

Three distinct categories of signatures recorded by the GPR were interpreted as having potential to represent human burials (Figures 16, 17, and 18). Signatures which were interpreted as positive responses for burials included hyperbolic or approximately hyperbolic signatures (Figure 16). These ranged in size, depth, and orientation throughout the area of investigation (AOI) and were interpreted as burials when approximate depth and spacing appeared to correspond with those expected for human burials.

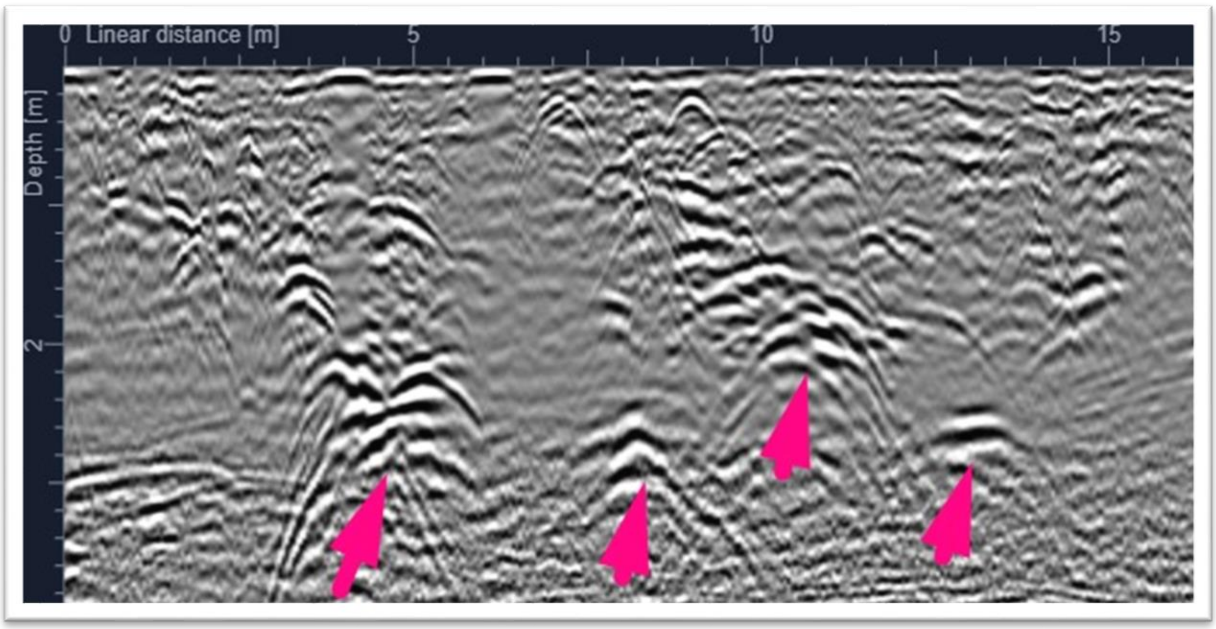

Figure 16: Hyperbolic signatures at somewhat regular spacing and consistent depth below surface. These signatures appear below 1.5 meters and appear spaced approximately 2.5 meters from center-to-center.

Short planar reflections were detected at depths expected for human burials throughout the AOI (Figure 17). These were signatures that appeared approximately horizontal to the ground surface, which are common when a radar passes over a buried horizontal surface. These signatures corresponded with signatures typical of historic burials which have been exemplified in the literature (Bigman, 2014; Conyers, 2012; Jones, G. 2008). Planar reflections may indicate approximately flat, horizontal surfaces such as the tops or bottoms of wooden caskets, or the bottoms of burial shafts.

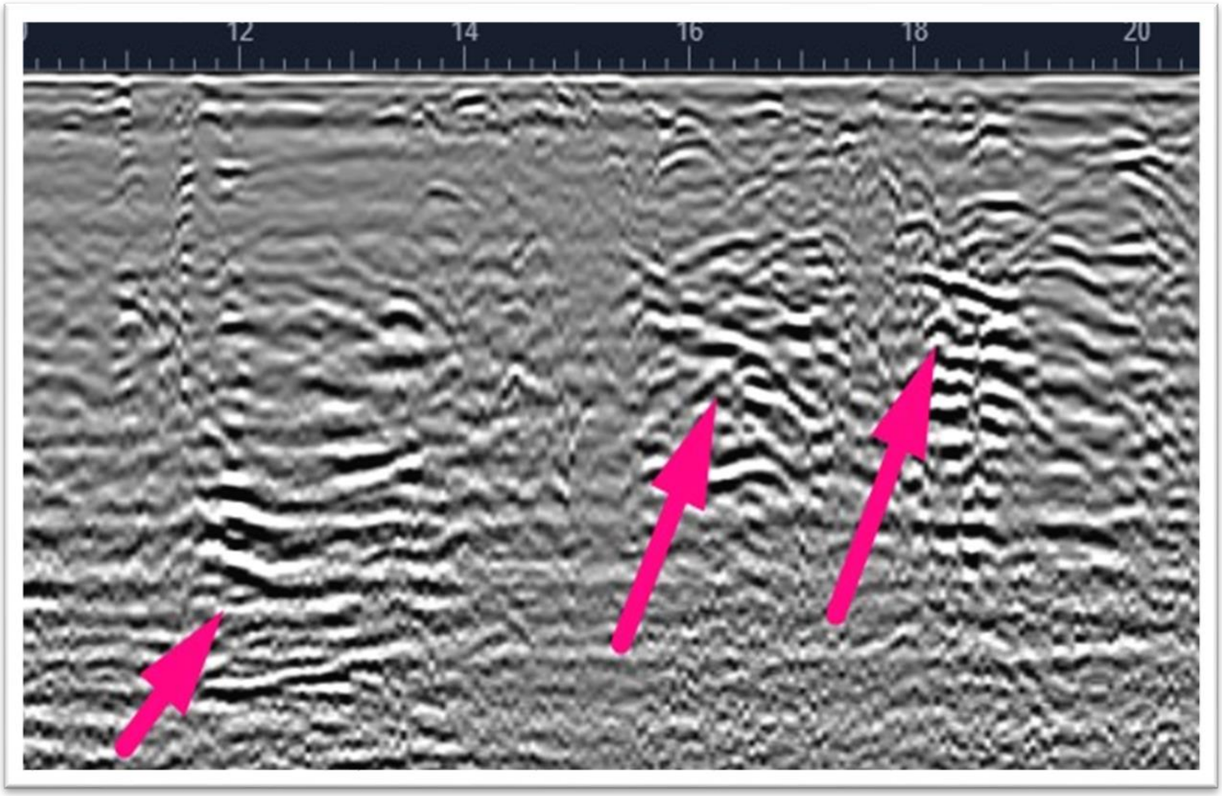

Figure 17: Planar signatures at somewhat regular spacing at depths consistent with expectations for human burials.

Vertical columns which appear relatively low in amplitude relative to the surrounding soil, and which extend from the surface to approximately 2 meters in depth were common throughout the survey (Figure 18). Low-amplitude columns originating at the surface may be indicative of the backfilled soil of a grave shaft (Bigman, 2014). These signatures were flagged as burials in instances where the approximate size and depth matched expectations for reflections characteristic of human burials. Notably, many signatures of this type were associated with approximately hyperbolic, or relatively high amplitude signatures at their base, which may indicate a potential cavity or object at the base of the supposed burial shaft. These signatures can further indicate water pooling at a surface, residue or gases from decomposition, or the buildup of organic materials which contrast to the surrounding soil matrix.

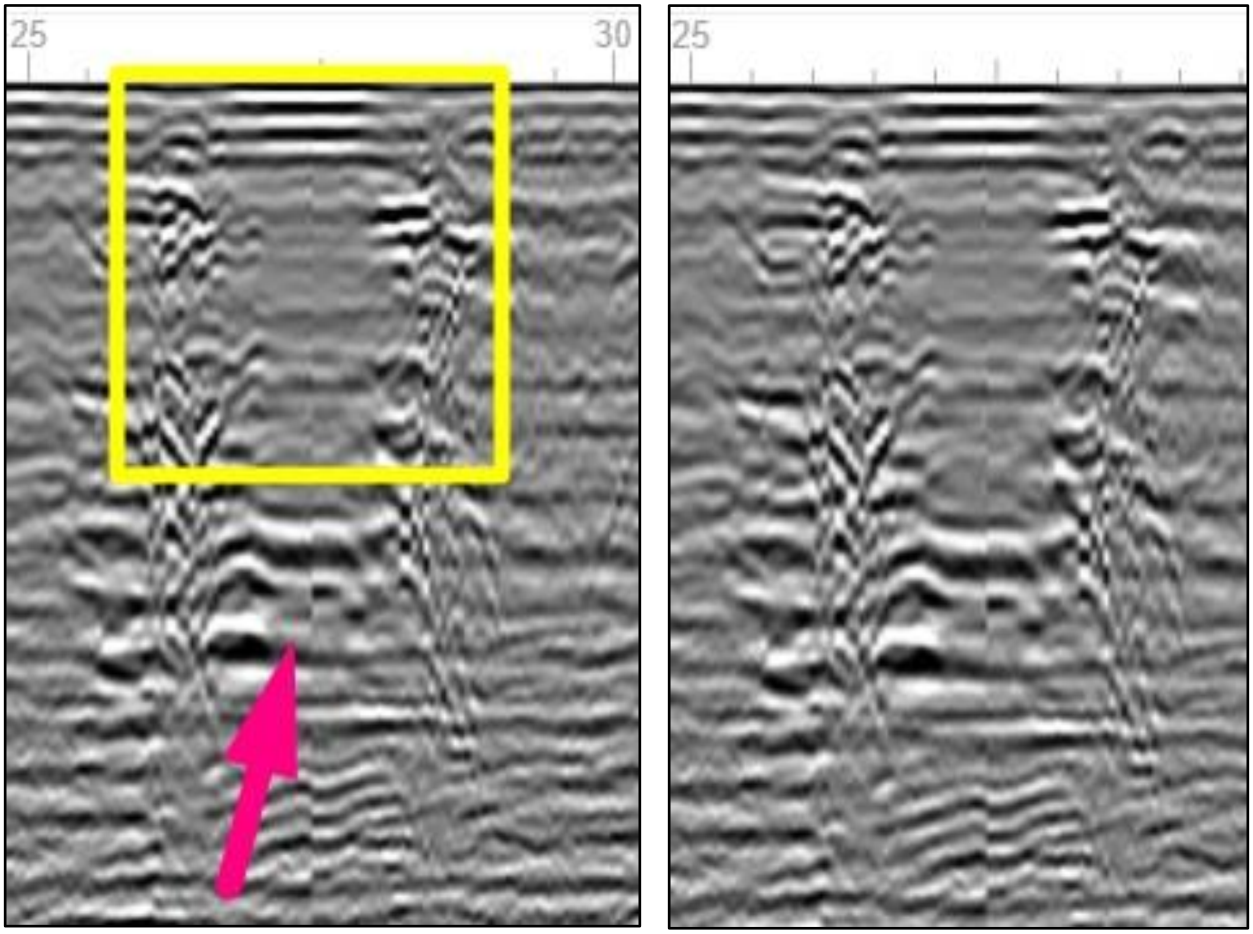

Figure 18: Low-amplitude shafts, bounded by approximately horizontal walls, with relatively high amplitude signatures at their base.

7. RESULTS

7.1 Distribution of Detected Burials at Penfield

The GPR investigation within the Penfield Cemetery generated data from an area of approximately 2.5 acres. Data collection was not undertaken in areas where the landscape did not permit access for the GPR due to steep terrain or the presence of large fallen trees and vegetative debris. Areas in which data collection was not undertaken accounted for approximately 0.35 acres in the southern central portion of the known cemetery, and included small sections throughout where large fallen trees or dense vegetation did not permit data collection.

The GPR recorded approximately 1,765 positive reflections which appeared consistent with those expected for human burials (Figure 19). Approximately 492 points were recorded with a GPS unit during pedestrian survey (Figure 19). Approximately two points were taken for most features, leading to an approximate count of 246 individual graves located through pedestrian survey. It should be noted that many visible indicators likely remain underneath a dense mat of leaves and debris, and this number is likely to increase as cemetery cleanup efforts continue.

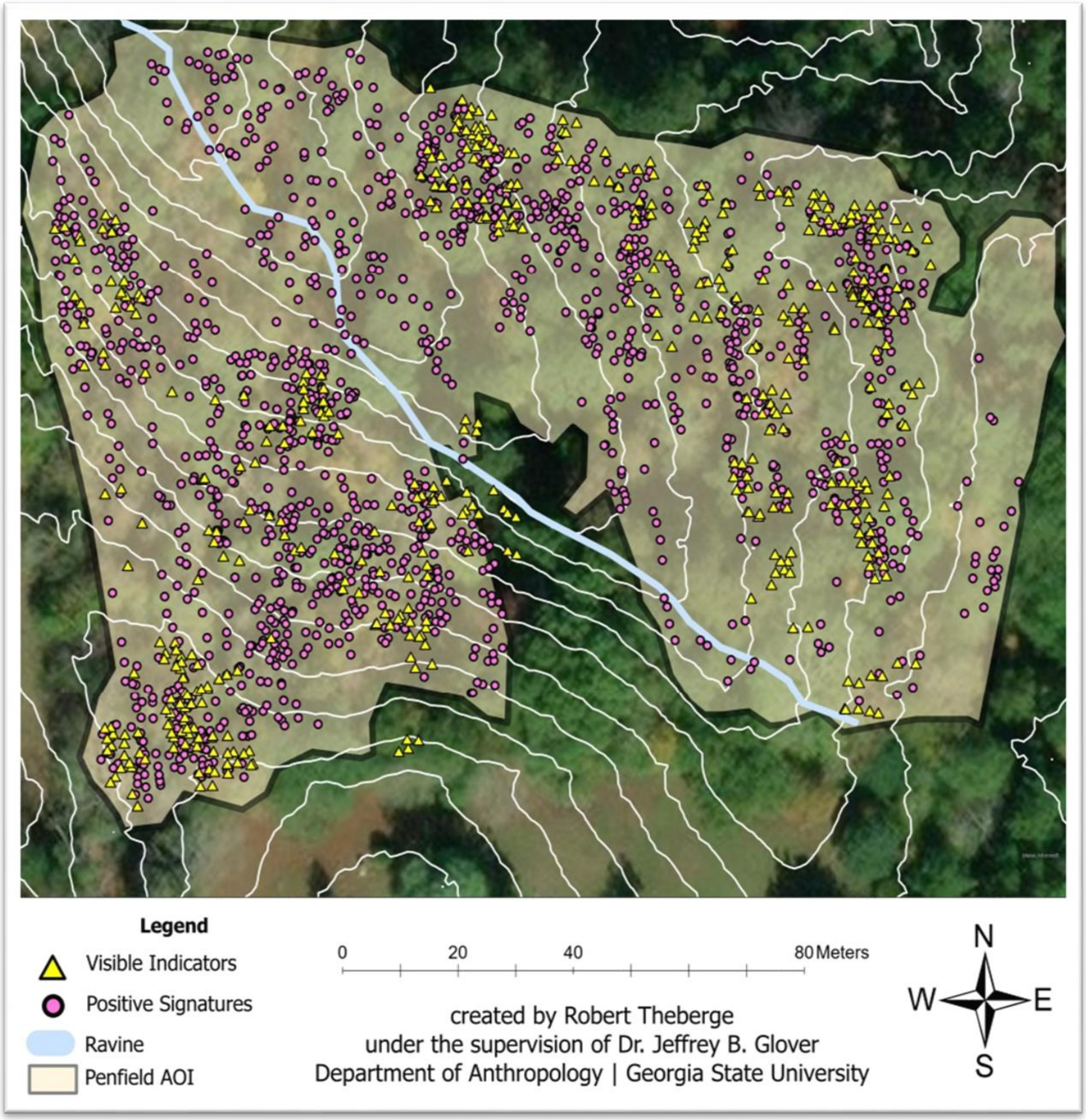

Figure 19: This image highlights the locations of visible features (n=492) and positive GPR signatures (n=1765) within the area of investigation at Penfield.

Approximately 1,029 individual graves have been estimated to exist within the area of investigation (Figures 20 and 21). See sections 6.3 and 6.4 for a discussion on how this approximation was determined.

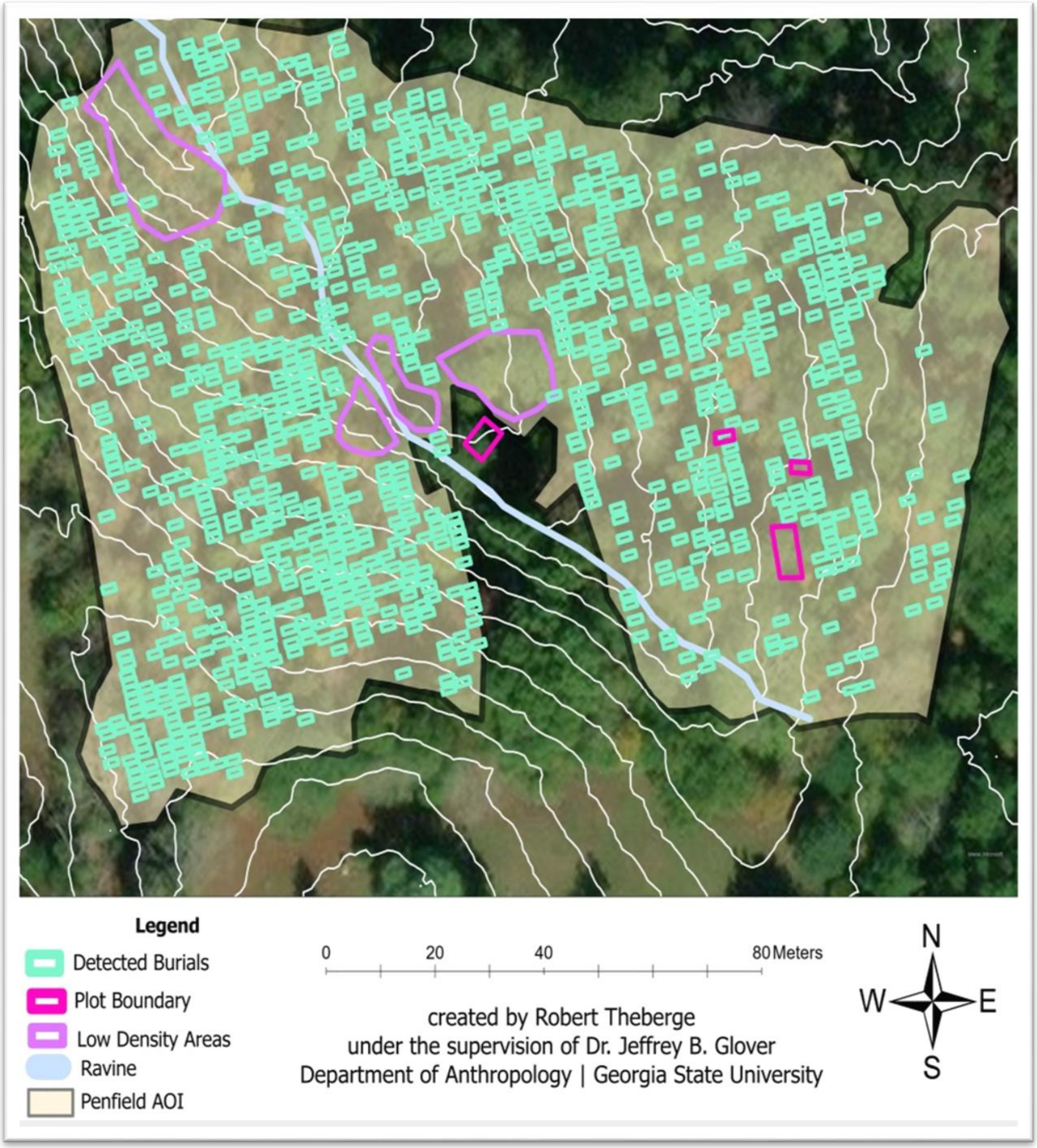

Figure 20: This image highlights the locations of signatures or groups of signatures which were interpreted as individual burials at Penfield (n=1029).

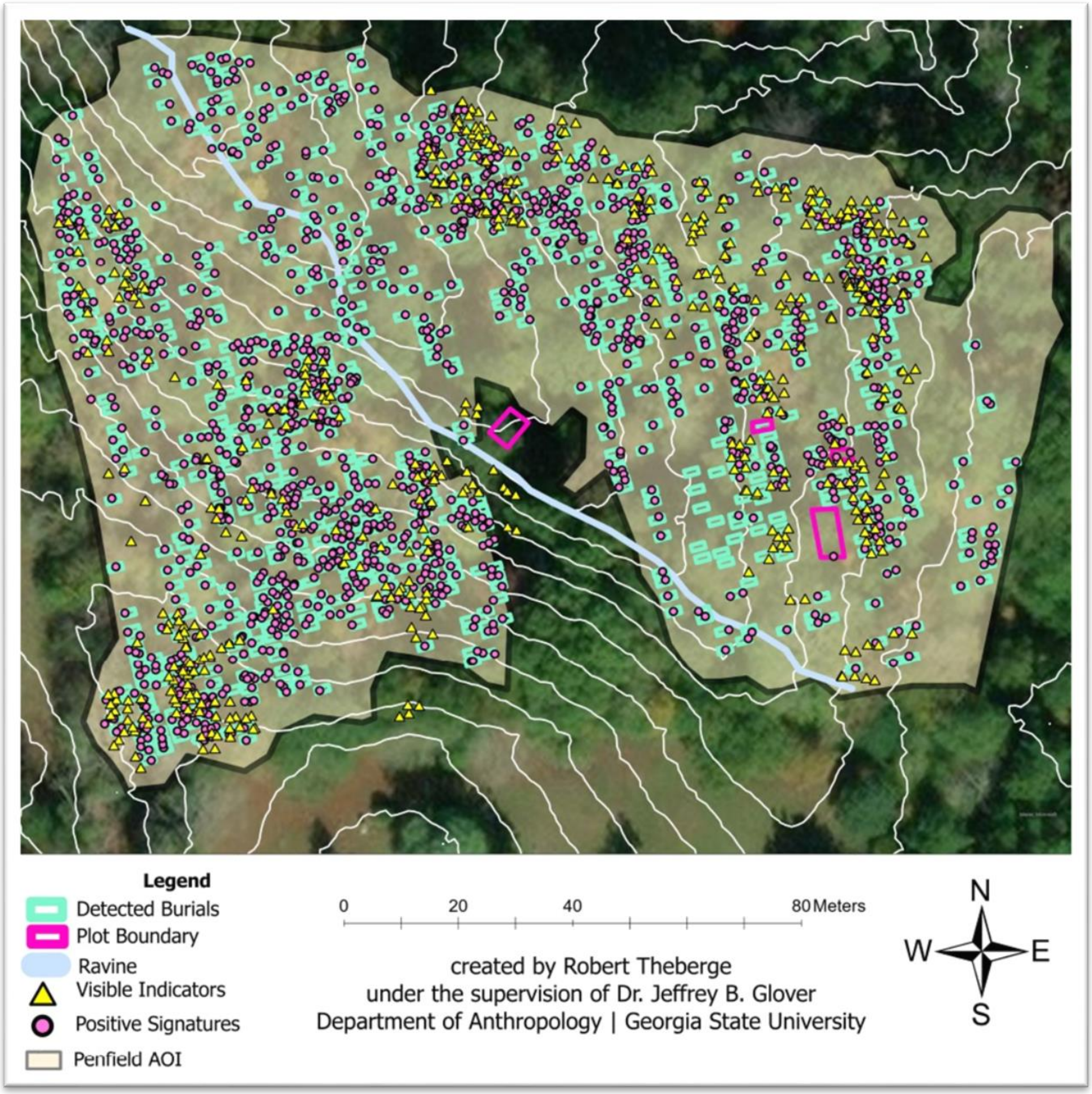

Figure 21: Visible indicators and positive GPR signatures plotted over polygons interpreted as individual graves.

7.2 Reflections of Interest Not Indicative of Burials

Relatively high amplitude horizontal or “planar” signatures were recorded throughout the AOI. When viewed in time-slice or top-down view, these groups of parallel planar signatures frequently span the width of the AOI, potentially indicating compacted surfaces or access roads (Figure 22). Signatures interpreted as burial shafts appear to bisect the road in some instances, indicating that the burials were interred after the road was constructed, potentially after it had fallen out of use (Figures 23 and 24).

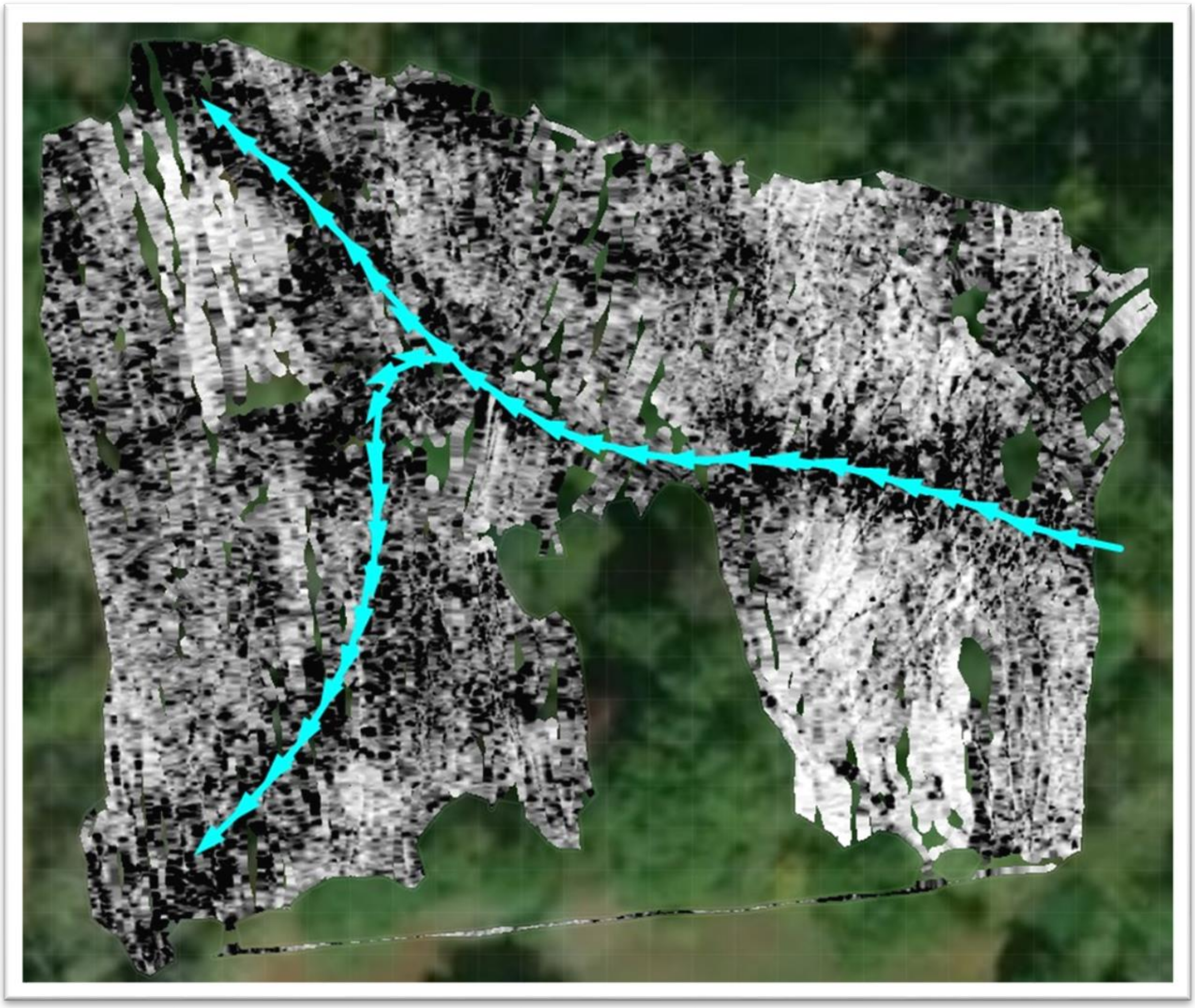

Figure 22: Blue arrows indicate a linear feature potentially indicative of an access road or logging road which appears to span the cemetery. Time slice represents a depth of 0.6 meters below surface.

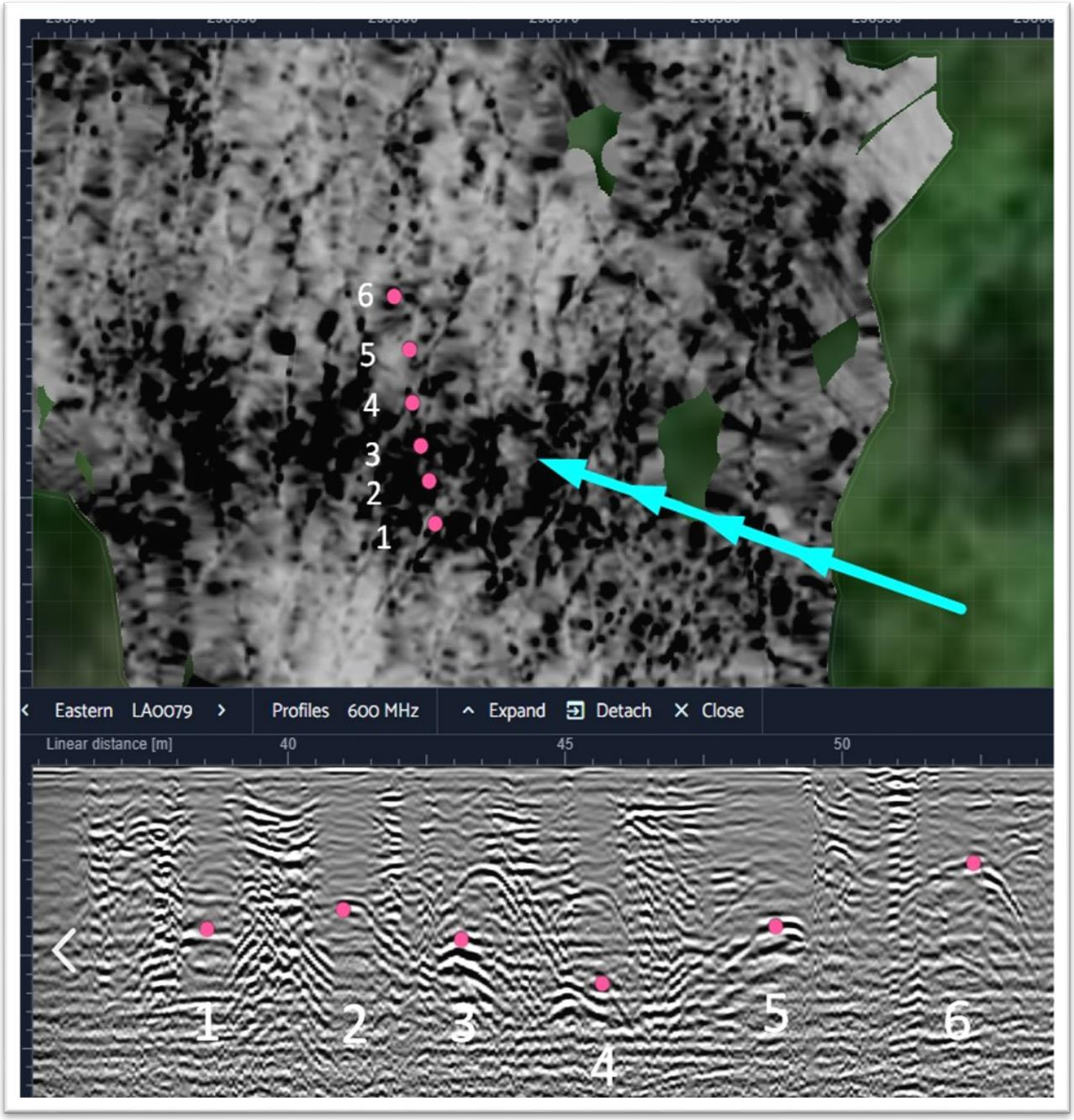

Figure 23: This image highlights a row of positive signatures indicative of burial shafts which intersect the compacted surface / road feature (see Figure 25). These signatures originate near the ground surface, suggesting that they were cut through the compacted surface. Depth of slice is approximately 0.5 meters below surface.

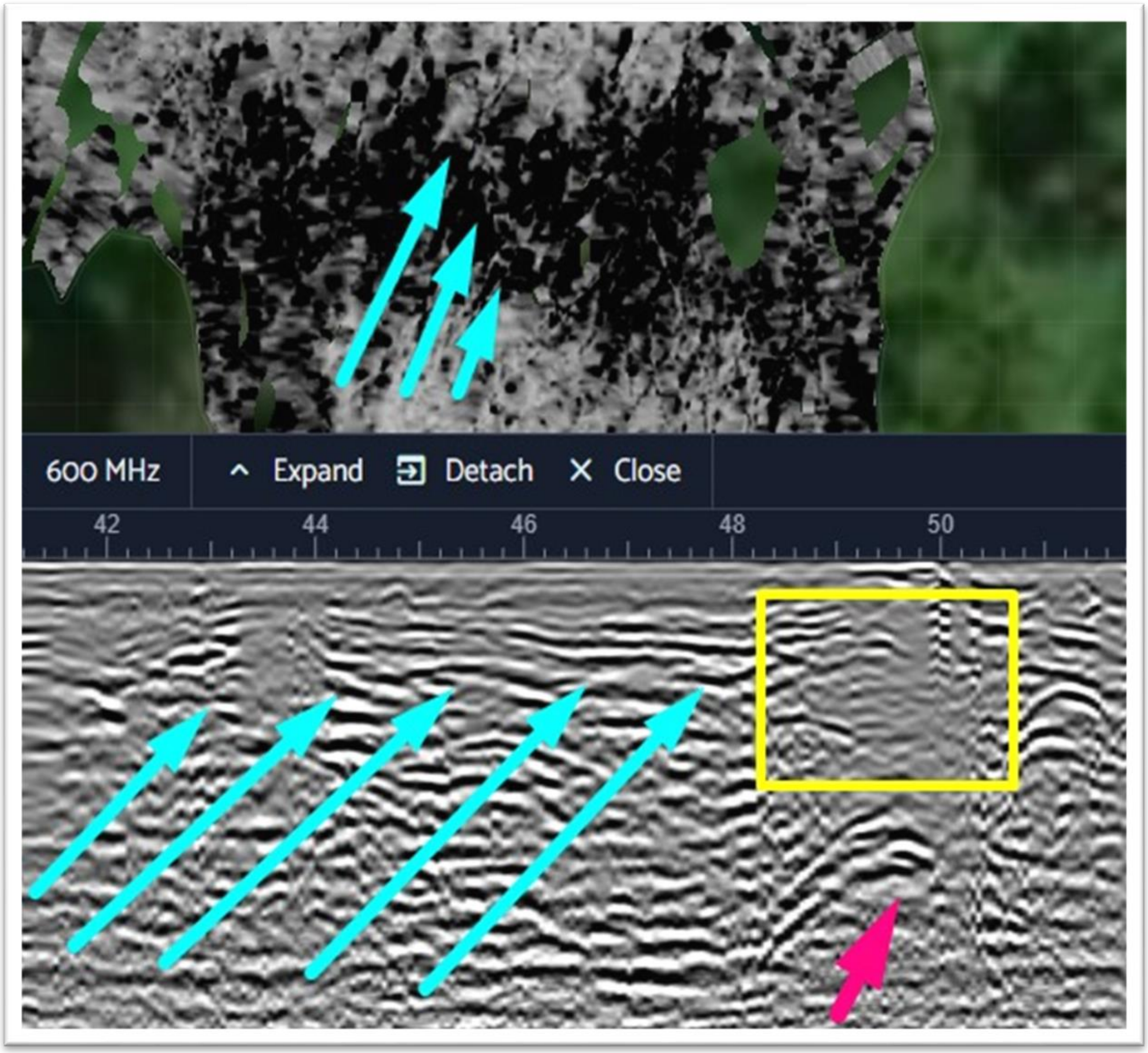

Figure 24: This image highlights a signature indicative of a shaft with a hyperbolic signature toward the base, approximately 1.5 meters below surface. This shaft appears to intersect the linear feature interpreted as a compacted surface or road. Depth of slice is approximately 0.5 meters below surface.

Swaths which appear devoid of high amplitude signatures occur throughout the AOI, suggesting areas which contain no burials, or where the burials in these regions do not exhibit qualities visible to the GPR (Figure 25).

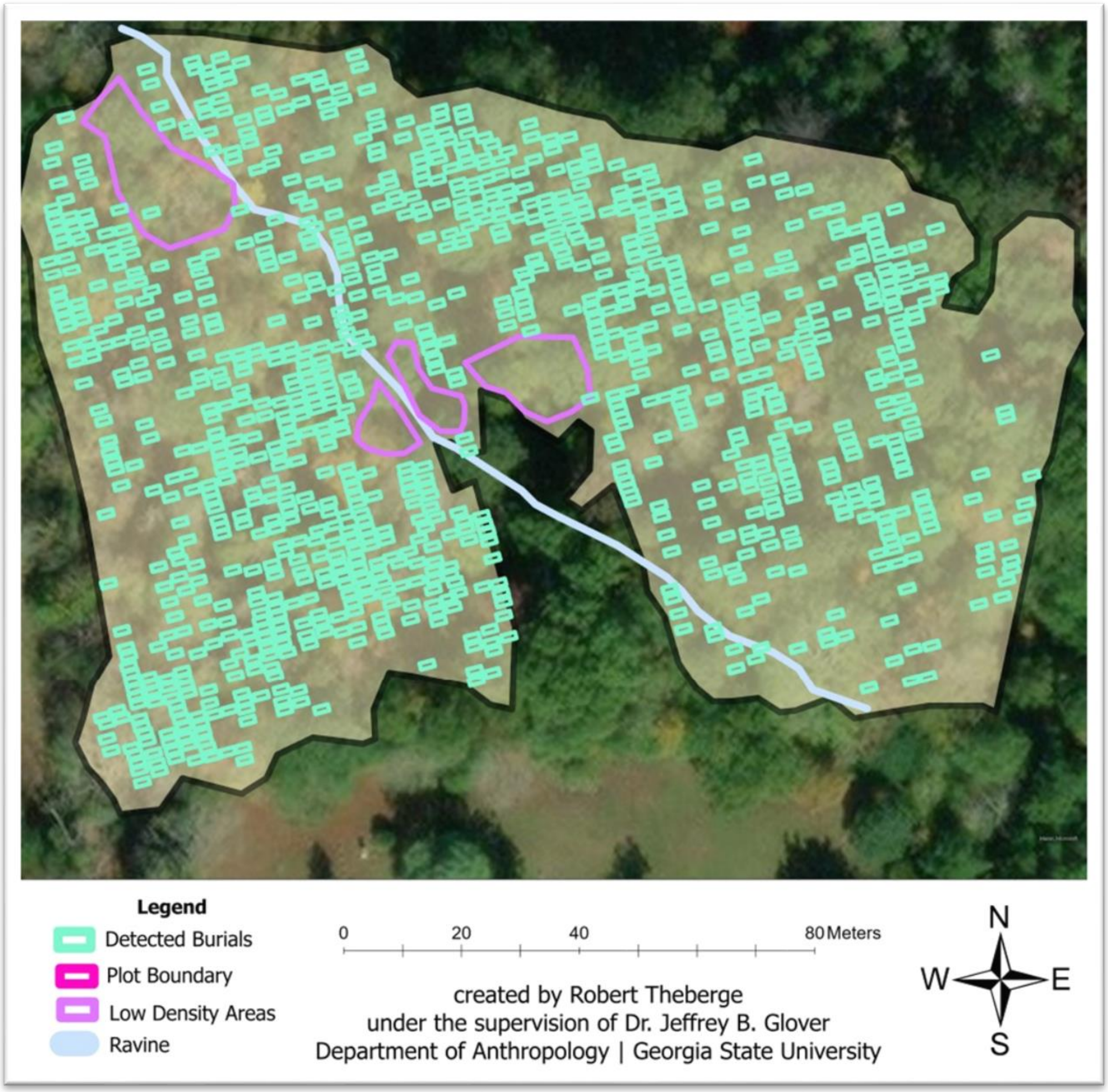

Figure 25: Areas with relatively low concentrations of positive signatures occurred throughout the area of investigation and appeared correlated with the low-lying regions of the cemetery along a natural water channel or small ravine.

8. DISCUSSION

The GPR investigation at the Penfield Cemetery was successful in generating a dataset representative of the approximate count and distribution of buried individuals in an underserved cemetery for which virtually no direct historical records exist. In doing so, this thesis contributes to the broader study of historic African American mortuary spaces, rural cemeteries, and to the historical narrative surrounding the Penfield community, a diverse 19th century community with ties to Georgia's early African American population, the plantation industry in the rural South, and to Georgia's higher education landscape. The 1000+ individual burials revealed through the investigation at the Penfield Cemetery display the wide variation in markers and morphology which have come to characterize historic African American cemeteries. The integration of the geophysical dataset generated for this thesis with a digital infrastructure known as the Digital Drawer (discussed below) will contribute to continued learning as research continues at Penfield.

The thesis addresses challenges in conducting research and preservation efforts within historic African American spaces, and how geophysics might contribute to overcoming the difficulties inherent in this work. When confronting the difficult histories which have directly or indirectly contributed to the aforementioned challenges, it may be easy to lose sight of the redeeming aspects of cemeteries such as Penfield. Cemeteries were sacred spaces where African American communities in the 19th century could exercise some control over the rites and rituals surrounding their own spirituality. The parallels which have been made between African and African American burial traditions suggest that these spaces, though often cited as marginalized and peripheral in the literature, can be viewed as places where communities could maintain ties to their heritage and ancestors. The nearly 3 acres of cemetery which makes up Penfield's African American cemetery is a tranquil space filled with memorials to the deceased who appear carefully interred in regular rows and intervals throughout. It is clear that care and intentionality went into the treatment of burying deceased individuals at Penfield. Daffodils, magnolia, oak, and cedar trees dot the landscape, and the space is decidedly shaded and quiet. It is easy to view these spaces entirely through the lens of hardship and oppression. However, authors such as Christina Brooks, Nicholas Honerkamp, and Ray Crook invite us to view these spaces as spaces of relative autonomy and "uniquely emic expressions of self-determination, tradition, and creolization" where oppressed people in history were able to retain some autonomy (Brooks, 2011; Honerkamp and Crook, 2012:104). When considered this way, Penfield can be seen as a place of relative peace among an otherwise difficult and inhumane landscape.

The numerous volunteer days which took place during the course of this project were multifunctional, serving as beautification efforts, moments of visibility for the preservation efforts within the space, and were also instrumental in facilitating my thesis research. An unintentional consequence of these cleanup days was the coalescence of community members, students, academics, and other interested individuals who arrived in cold rain and humid sunshine to clear logs and brush from the cemetery landscape. Notably, individuals representing African American descent communities as well as European American descent communities with respective ties to Penfield were equally compelled to engage in preservation efforts in the cemetery, having realized the importance of memorializing the space. On more than one occasion, descendants of plantation-owning families were engaged in manual labor side-by-side with descendants of Penfield's early African American population.

8.1 Discussion of Results

Various characteristics of human burials can result in hyperbolic reflections, such as in-tact caskets, shaft / soil interfaces, or pockets of water or air. Pockets of trapped water or air may be the result of water pooling at the bottom of the grave shaft or air trapped in un-homogenized backfill soil, respectively (Conyers, 2012). These signatures were flagged as burials when approximate size, depth, and spacing appeared to match expectations for characteristics of human burials. Reflections which represented graves based on the interpretative methods defined in this thesis were typologically varied, and a number of factors may result in the variation in burial signatures observed in this investigation.

Mortuary treatment may have changed over time, especially considering that the use-life of the cemetery likely spans from pre-emancipation to the early to mid-20th century. A change in freedom of choice and access to resources following emancipation may account for some of the wide variation in burial signatures at Penfield considering that differences in mortuary treatment may have followed this increased access to resources. Given the appearance of metal memorial plaques predominantly associated with the McCommons funeral home in Greene County (est. 1900, Greensboro, GA), as well as engraved headstones such as those bearing the historic Haugabrooks name (est. 1929, Auburn Ave., Atlanta, GA), it appears that burial treatment became more formalized at some point. The eventual adoption of formal caskets, or mechanically-dug grave shafts may have an effect on the shape or strength of a GPR reflection in profile, potentially accounting for some of the variation in reflections throughout Penfield. In *To Serve the Living: Funeral Directors and the African American Way of Death*, Suzanne E. Smith (2010) offers a lengthy discussion on the emergence of African American morticians in the late 19th and early 20th centuries. Within, she details the growth in the funeral industry following the Civil War, and specifically discusses the rise in the funerary industry as a viable economic opportunity for Black Americans following emancipation (Smith, S., 2010). It is clear from this discussion that funeral rites became more formalized in the 20th century, evidenced by the appearance of formal grave markers in Penfield during this time. It is presently uncertain whether this has implications for the appearance of burial signatures in radar data; however, this could be an interesting topic for continued research at Penfield.

Variation in the landscape may account for some variation in the type, depth, and amplitude of signatures throughout Penfield. Erosion from the north-facing slope, along with potential overflow from the apparent ravine at the base of the slope (Figure 25) may obscure burial signatures in these areas or may result in the appearance of deeper signatures. Furthermore, areas on or above the sloping regions of Penfield (largely to the south of the apparent ravine) may be prone to erosion, which may increase or decrease the potential for a reflection event to occur as the movement of water and soil throughout the landscape potentially disrupt the soil within and surrounding graves in these areas.

Low-lying regions of the cemetery may be prone to sediment buildup. This may account for a relative lack of positive signatures and/or visible indications of graves in regions surrounding the low-lying areas and apparent ravine at Penfield (Figure 25). In these regions, it is possible that burial features which might otherwise result in a reflection event now rest below the effective penetration depth of the radar due to sediment buildup over time. It remains possible that burial shafts have been partially filled in or homogenized for these same reasons, leading to false negatives in the data.

The frequent use of caskets in burials would potentially alter signatures, resulting in relatively high-amplitude hyperbolic signatures where coffins remain somewhat in-tact. In particular, concrete caskets or buried remains of concrete crypts would be expected to exhibit a relatively high-amplitude signature in radar profiles. We might expect signatures with a distinct "phase shift" from the surrounding matrix to be characteristic of burials in which intact or partially intact caskets retain some void space (Conyers, 2006). The use of a casket may result in a more significant void space in the burial where backfill did not completely settle or homogenize. The stark velocity change between soil and void space has been shown to sometimes result in a "phase shift" which is visible in GPR radargrams (Cassidy, 2009; Conyers, 2006). This type of signature was visible in some instances at Penfield and may have implications for burial treatment, there (Figure 26).

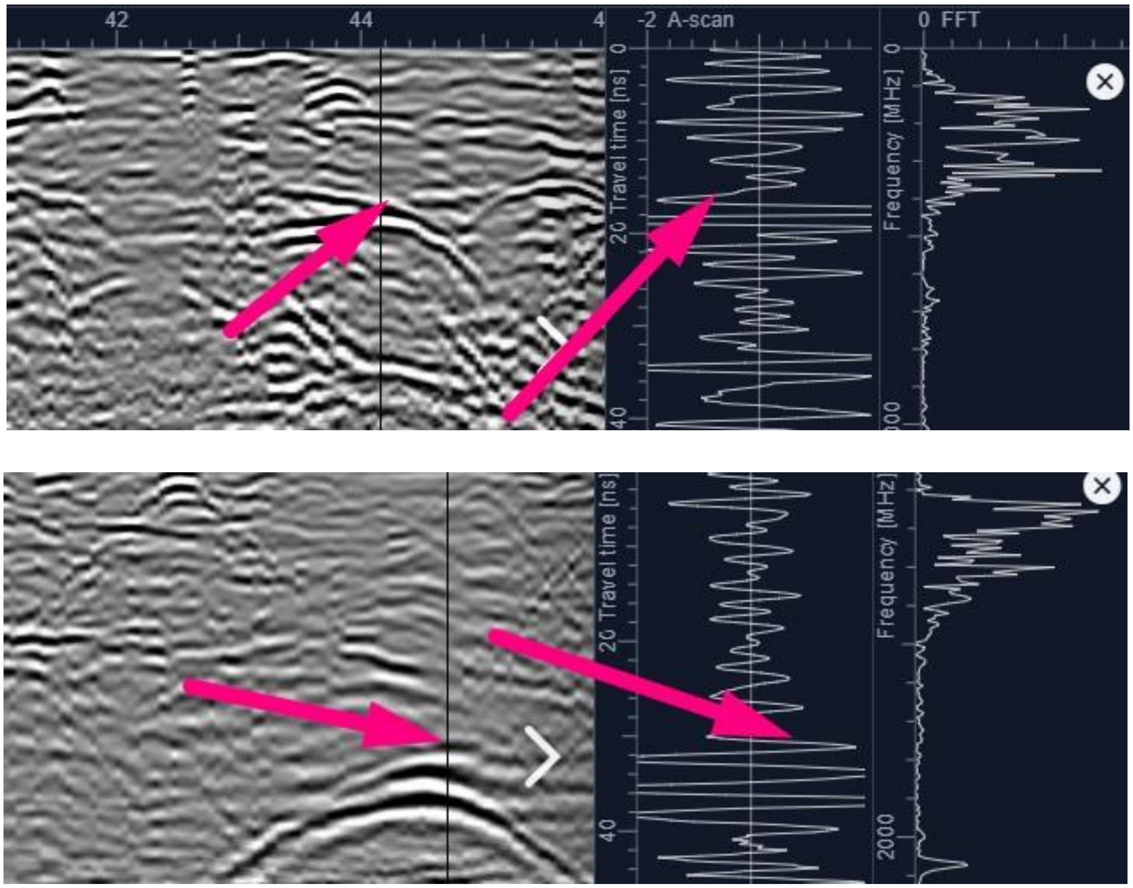

Figure 26: This image highlights a potential example of a phase shift in data from the Penfield Cemetery. **Top:** This signature exhibits normal polarity (black/white/black pattern), indicative of a solid buried object. **Bottom:** This signature exhibits reversed polarity (white/black/white), indicative of a stark velocity difference from one medium to another, potentially from soil to air in this case.

Notable signatures not characteristic of human burials, but which lend information on the use-life and character of the cemetery itself, are those which indicate compacted surfaces (Figures 24, 25, and 26). Signatures of this type may be indicative of buried roads presumably used for cemetery access, or as logging roads. These signatures result in linear features when viewed in time-slice (top-down), which appear to span the boundaries of the cemetery (Figure 24). Through personal communication with a local community member during a volunteer maintenance day at Penfield, I learned that an access road once existed along the northwestern margin of the cemetery (personal communication, January 2023). This appears to be confirmed in the data, where evidence of a compacted surface appears to extend from the northwest, through the central low-laying area of the cemetery and exits through the eastern margin where an access road is visible in historic aerial imagery (see Figure 6). Burials appear within the boundaries of this apparent road or path, which may have implications for the age of the road, and of the burials within it. It may be the case that individuals were buried in these areas as other usable regions of the cemetery became filled, however this is presently uncertain.

Clustering is apparent between positive GPR signatures and visible indicators of graves (Figure 21 and 23). Regions within the AOI with concentrations of visible indicators of graves (grave markers, depressions, plot boundaries) tend to be correlated with concentrations of positive GPR signatures. However, there appear to be regions where positive GPR signatures are not correlated with corresponding grave markers, and conversely, instances exist where visual indicators of graves are present, but have no corresponding reflection (Figures 21 and 23). For cases where reflection events occurred with no corresponding marker, it is possible that markers are still in situ, but were not visible at the time of data collection and are thus not represented in this dataset. It is also possible that many markers are no longer in situ, have degraded if made of organic materials, or that some burials associated with positive GPR signatures were completed without markers.

GPR data collection was largely undertaken during winter and fall months, when undergrowth was minimal, and thus the ground was more easily traversed with the GPR. This also resulted in the canopy being less dense, resulting in better positioning accuracy for the GPR due to the increased sky view afforded to the attached GPS. However, the majority of the GPS points collected for visible features were taken during spring months when the canopy was at its peak. This resulted in decreased positioning accuracy while mapping visible features, which may account for some discrepancy in marker / signature locations.

The categorization of various types of signatures and their spatial extent could help to answer questions surrounding burial treatment over time and in different sections of the cemetery and could represent an interesting line of inquiry moving forward. As cleanup efforts continue within the cemetery, visual markers of graves will continue to be uncovered, and this dataset stands to be strengthened should a future researcher decide to pursue a more thorough mapping effort at Penfield.

8.2 Challenges

The dense vegetation which includes standing and fallen trees of variable size created further difficulties in data collection. Best practice in GPR data collection typically involves parallel transects at regular spacing in a direction which crosses targets perpendicular to their orientation (Bigman, 2014; Conyers, 2006). In almost every transect, trees of various sizes were encountered. Standing trees as well as large fallen trees typically result in the termination of data collection, acting as natural boundaries for a particular area. These obstacles make collecting data in formalized grids difficult or impossible. These challenges were met in a number of ways. The coupling of the GPR to an RTK-level GPS system allowed for real-time positioning, and thus greater adjustability with regards to transect length and travel paths through the landscape. This allowed for the circumnavigation of obstacles while continuing data collection, resulting in greater efficiency during the investigation. Non-georeferenced transects might otherwise require stopping and starting data collection on either side of obstacles, resulting in reduced efficiency and speed during data acquisition. The clearing of large trees and debris was conducted in respective areas before data collection took place. This was instrumental in our attempt to generate a full coverage dataset at Penfield. The collection of data predominantly in the months before large amounts of undergrowth covered the ground further allowed for greater accessibility and efficiency within the space, while also allowing for better avoidance of grave markers and sensitive material remains which may have otherwise been covered by dense summertime vegetation.

Historic cemeteries offer a wealth of cultural information, oftentimes not available through written records. However, the nature of rural African Cemeteries to exist in heavily wooded, irregular land typically with no consistent maintenance means that conducting research in these spaces can be a complicated and exhausting task. The results of research in these areas may thus be difficult to interpret due to the landscape often being less than ideal for scientific inquiry. If we take cemetery placement and present state of vegetation and undergrowth to be a direct or indirect result of oppression and socio-economic conditions of African American populations in the past, we can conclude that the oppressive and racist policies which have characterized much of the history of the United States have directly limited the ability of research to be performed in these marginalized spaces in the present.

In *Seizing Intellectual Power: The Dialogue at the New York African American Burial Ground*, Cheryl J. La Roche and Michael L. Blakey cite a dilemma in African American archaeology, in that the field is “theory poor, not data poor" (La Roche & Blakey, 1997 citing Singleton and Bograd, 1995). This is to say that a wealth of archaeological remains from African American contexts have been collected and recorded, however, much of these data have been analyzed by Euro-American scholars with little experience in African American studies. Research which has been performed with the material remains of African American culture may lack a formal theory or may lack one which has been sufficiently informed by either African American scholars, or those with sufficient experience in African American history and intellectual traditions to be considered holistic or sound. This is a particularly salient point when considering the ultimately destructive nature of archaeological excavation. When we note that many of the archaeologists who have performed research within African American contexts have been Euro-American individuals with no formal training in African American studies, we are faced with a conundrum of how to continue to perform ethically sound archeology in these contexts. Considering that much of the material remains of African American culture now sit out of context in laboratory or museum collections, or have been ultimately ruined by development, the need arises to reconceptualize archaeological methods within African American contexts. The nature of remote sensing and GPR to be non-destructive offers a solution to one aspect of a complex problem. Non-destructive testing leaves the research site in-tact, allowing for the collection of large datasets which can be analyzed now and into the future. Making the results of research publicly accessible and interactive may lead to a more holistic dialogue including a wide range of interlocutors within and outside of the academic sphere, which can strengthen interpretations, and guide future research efforts.

As I have little formal experience in African American studies, this thesis could have easily succumbed to the pitfalls of research which lacks sufficient background to properly contextualize results. This has been mitigated in two significant ways.

The nature of my research at Penfield to leave the site relatively in-tact means that the site retains its cultural and historical information for future research and interaction. This feature of geophysical research, paired with ambitions to make all data and results visible to the public, means that the results of this investigation may be subject to numerous interpretations and discussions surrounding Penfield, allowing stakeholders to create their own “meaningful and useful” interpretations of the information (McDavid, 2002:305). The generation of new knowledge through minimally destructive archaeological research will thus result in future utility of results without diminishing Penfield as a research tool and as a place of remembrance.

Apprehensions stemming from my position as a sort-of interloper with no direct connection to Penfield were addressed in part through the numerous informal conversations with various stakeholders in the field. Volunteer days provided an arena for discussions surrounding Penfield’s history, the present state of Penfield’s African American cemetery, and the ways in which research and field work might contribute to its preservation. These were times when I was able to interact with Black and White members of Penfield's descent community like Fanny Rowe and Walter Boswell, as well as with historians such as Dr. Doug Thompson. Interactions with individuals who have direct connections to Penfield, or who have personal interest in its revitalization helped to contextualize the site within the broader history of the region and served to bring visibility to the various efforts taking place there. Though no formal ethnographies were conducted during the course of this thesis, field interactions such as these, along with e-mail correspondence between various other stakeholder groups guided research efforts and interpretations. For example, during a conversation with a member of the Rowe family while in the field, I was informed of an access point which once existed at the northeastern margin of Penfield's African American cemetery. This access point was corroborated by the data, whereby reflections from a compacted surface indicative of a road were revealed during data analysis. The location and orientation of these reflections matched the location of the access point indicated during our conversation (see Figures 22 and 23). This is one example where interactions between community members were fruitful in helping to contextualize and guide research and interpretations. The coalescence of numerous volunteers and stakeholders during this time reinforced the importance of efforts within Penfield to a variety of individuals and institutions.

While this project has been successful in driving interest in and bringing some visibility to Penfield's African American Cemetery, I imagine the results will become increasingly useful moving forward as ambitions for Penfield's revitalization take shape. The results outlined in this thesis should be effective in guiding revitalization work within the space, leveraging access to resources, as a tool for outreach, and as a case study in the efficacy of community-driven geophysical research in guiding preservation work.

9. CONCLUDING THOUGHTS

Penfield's African American cemetery is nestled in a wooded, undulating landscape out of view of any existing road or residence. The hidden character of the topologically and botanically varied landscape makes it appear unkempt and ignored, yet tranquil and secluded at the same time. This seclusion has opposing implications for the preservation of the space, whereby the cemetery has suffered from a lack of maintenance, compounded by the effects of rain, wind, and unchecked overgrowth on the landscape. Simultaneously, Penfield has been immune to the effects of urban growth and development which threaten so many spaces like it. Penfield's relative seclusion, surrounded by private, undeveloped land in a tucked away corner of Greene County, may have been a factor in its relative preservation until the present day.

Geophysical research was initiated at Penfield with the intent of collecting information on the number and distribution of burials within an underserved African American cemetery in rural Georgia. The geophysical research took place over the course of three field deployments, each of which followed a volunteer cleanup day which provided further access to an area within the cemetery. I personally participated in four volunteer cleanup efforts throughout the course of this project, which involved volunteers from the local community, Georgia academic institutions, students, and various other interested parties performed strenuous manual labor to clear the land of debris to facilitate research and to beautify the space. These were the moments in which most of my interactions with community members and other stakeholders took place. Our collective interactions with and within the Penfield Cemetery led to conversations about Penfield's history, about the various connections that community members had with the space, and about the various avenues of research which was being conducted about it and within it. It was during these cleanup efforts that I met the current landowner and descendant of Penfield's African American community Fannie Rowe, and members of her family who now live throughout the state. In at least one instance, we found ourselves working alongside during Macky Alston and Walter Boswell, both descendants of Penfield's early Euro-American community. These interactions served to reinforce the importance of the revitalization efforts taking place at Penfield, where descendants of both sides of these historically disparate communities worked toward the revitalization of Penfield's underrepresented history. These were also important moments during which research efforts became visible and tangible, and during which I was able to address questions about my work with community members.

The first geophysical investigation at Penfield resulted in the identification of approximately 1029 individual burials within an area totaling approximately 2.5 acres. An accurate count of buried individuals cannot be estimated at this time, as many grave markers likely exist partially buried below fallen trees, dense leaf matter, and likely under a layer of topsoil within the lower elevations of the cemetery. Many of these will be revealed as cleanup efforts continue within the space.

This research is significant in that it is the first step in developing an archaeological record for a place in which few direct historical records or accounts exist. This information will be useful in guiding future research and preservation efforts within Penfield's African American section, as the significance of the cemetery and of the history contained within are realized.

A second initiative within this project was the inclusion of all results in a publicly accessible database intended to foster further interaction with data gathered within the Penfield Cemetery. In collaboration with the Pitts Theology Library, the Historic Rural Churches of Georgia nonprofit, and the Greene County African American Museum, visibility and access to data and information will be increased through the respective networks of each organization. Community members, researchers, and all interested parties should be able to access and interact with the results of this and future research in perpetuity in order to answer their own questions about the space, and to foster future research initiatives at Penfield and in similar contexts within and outside of the American South.

Reusability of data is an essential aspect of scientific research (Wilkinson et al., 2016). Reusability has two meanings with regards to this project: On one hand, the literal reusability of GPR data can foster continued learning and analysis, ensuring that the work that is being done has utility for future research. Second, reusability must be interpreted as it pertains to the public sphere. In formatting the results of research in a way that they are relatively easy to access, interpret, and interact with, we can help to ensure the reusability of results within non-academic spheres, giving agency to community members and other interested persons to ask their own questions about the cemetery.

9.1 Digital Drawer Initiative

In collaboration with the Digital Collections section of Emory University's Pitts Theology Library and the Historic Rural Churches of Georgia (HRC) nonprofit preservation group, we aim to integrate our geophysical and geospatial research with wider institutions and heritage preservation efforts in a way which will serve to make data more widely available, and in relative perpetuity. This will be realized though integration with the Digital Drawer initiative. The Digital Drawer is a proposed repository for heritage data which is in the process of being made publicly accessible and updateable through a web-based portal based in Omeka S heritage management software. The Digital Drawer initiative has notably received funding from Georgia's Robert W. Woodruff Foundation for research and development. This infrastructure has hitherto been under development by Dr. Spencer Roberts of Emory University in collaboration with Sonny Seals of the HRC and is currently in use by both respective organizations to foster accessibility and interaction with their own digital heritage collections. The digitized results of research from this investigation will interface with the HRC website as a spatial archive driven by contributions from local communities, the general public, and academic institutions alike.

Ideally, this will serve as a template where similar cemetery investigations can be integrated into the HRC database as more underserved cemeteries which are associated with rural churches in Georgia are subject to archaeological investigations. All data and results, including this thesis, will be entered into this database in order to consolidate geophysical, geospatial, historical, and archival data.

The integration of this research with the Digital Drawer is currently in its experimentation and development phase. Alongside Dr. Spencer Roberts, I am researching ways to integrate the geospatial data currently hosted in an ArcGIS platform with the HRC's data acquisition platform driven by the aforementioned Omeka S heritage management software (Figure 27). Omeka S is unique in that it allows for the outsourcing of data input via user-friendly data acquisition modules which can be programmed with a custom set of descriptive categories, allowing for virtually any user with internet access to upload heritage content (photographs, documents, records, etc.) to be georeferenced when available, and integrated with associated records and metadata when possible. In seeking to preserve and disseminate geophysical and geospatial data for a public audience, this case study contributes to discussions surrounding the development and standardization of best practices for the creation of digital archives that include both historical materials and newly generated archaeological data, particularly in community-involved projects.

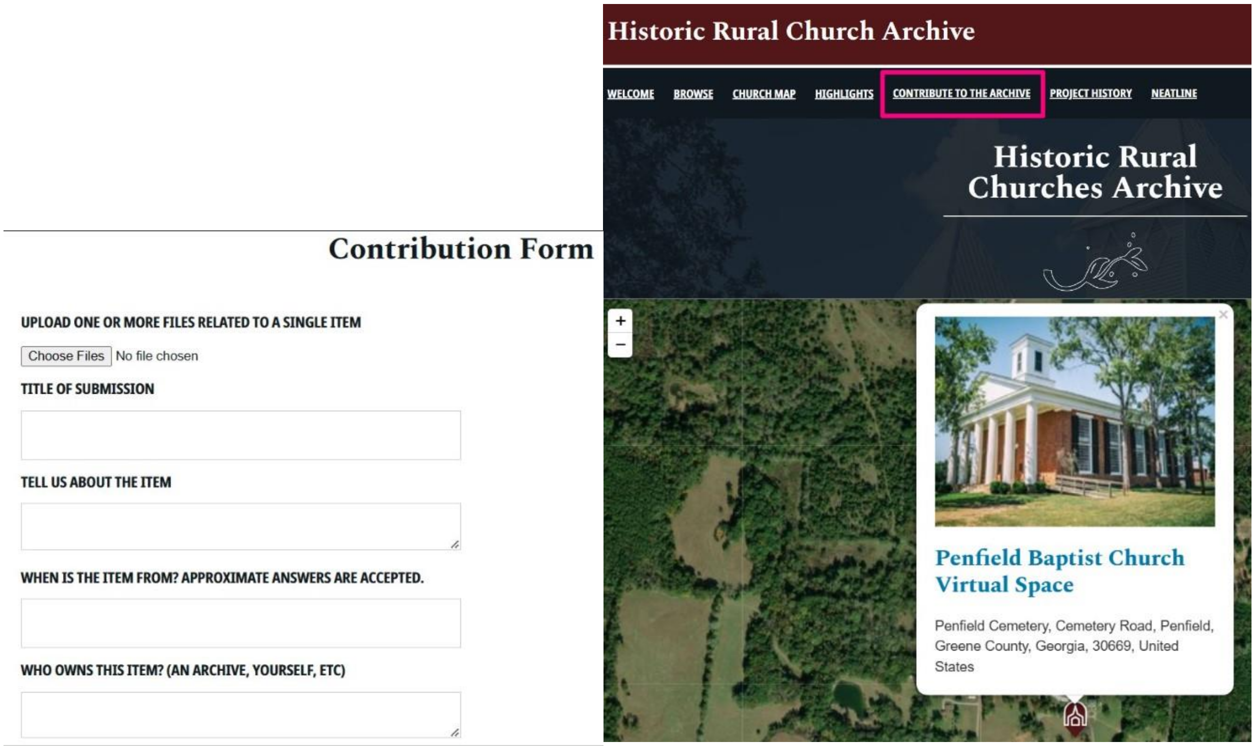

Figure 27: Left: This represents an example a contribution form hosted by the HRC which allows users to submit heritage information in the form of documents, photographs, and spreadsheets among others for inclusion in the HRC database. Right: An interactive map hosted by the HRC allows for content to be spatially-referenced ad associated with rural churches currently documented by the HRC. It is hoped that a similarly interactive map of the Penfield cemetery can be integrated in the HRC website.

MOVING FORWARD

At present, no funding is available for the restoration, memorialization, or maintenance of Penfield's African American section. Preservation efforts will continue in the form of volunteer-oriented manual labor initiatives into the near future. In addition to guiding preservation efforts through the identification of the distribution of unmarked burials, I hope that this research will provide some impetus for the acquisition of resources toward the restoration and memorialization of the space. The likely identification of over 1000 burials with rich variation in morphology and memorialization methods speaks to the significance of the space as an important spiritual, cultural, and historical repository surrounding African American lifeways spanning the 19th and early 20th centuries. It is uncertain whether stakeholders plan to pursue nomination for NRHP, or if newly accessible government funds will be made available to Penfield. Regardless, it is my hope that this research will strengthen preservation efforts wherever they are directed.

When asked about her ultimate hope for the future of Penfield's African American section, Mamie Hillman stated that "it is [her] prayerful hope that [Penfield's current] owners would work and collaborate with the powers that be to create an endowment or resources that could assist in maintaining this sacred space continuously. This includes nominating it for a designation on the National Register of Historical Places. Preservation is much needed, and some continual maintenance must be put in place as soon as possible." (Hillman, M. personal communication, 2023).

There are presently no federal, or state resources allotted for the maintenance and preservation of Penfield's African American section. Cemeteries in Georgia are defined as "abandoned" when said cemetery "...shows signs of neglect including, without limitation, the unchecked growth of vegetation, repeated and unchecked acts of vandalism, or the disintegration of grave markers or boundaries, and for which no person can be found who is legally responsible and financially capable of the upkeep of such cemetery" (Van Voorhies, 2003:77). Many historic rural and African American cemeteries fall under this category in Georgia, leaving them at risk for further degeneration through neglect, or destruction from encroaching development (Brooks, 2011). While federally mandated regulations for cultural heritage such as NAGPRA, and Section 106 of the National Historic Preservation Act offer some protections for historic cemeteries, they pertain only to a narrow category of cemetery spaces which are Native American in origin, or which result in eligibility for the National Register of Historic Places, respectively. Other laws and regulations surrounding historic and “abandoned” cemeteries vary from state-to-state. Official Georgia Code sections 36-72-1 thru 6 provide definitions for terms surrounding cemeteries and outline various protections. While authority is given to counties and municipalities to direct efforts toward maintenance and protection of these spaces, the aforementioned laws do not *compel* government entities to act, or to direct funds toward the preservation of abandoned cemeteries, leaving them at risk due to neglect. In February 2022, North Carolina Democratic Congresswoman Alma Adams with Ohio Senate Democrat and various cosponsors introduced House Bill H.R. 6805 to the House Committee on Natural Resources with the goal of directing federal funds toward the preservation of abandoned African American cemeteries. Signed into law in December 2022 as part of H.R.2617, the Consolidated Appropriations Act, the directive now authorizes the Secretary of the Interior (SOI) to direct federal grant funding to various federal, state, and local agencies in order to “identify, interpret, research, preserve, and record African-American burial grounds that have been left unmarked, previously abandoned, or underserved” (Beasley, Joy. 2022). It is presently unclear how this legislation will affect the ability of stakeholders to leverage resources for the maintenance of Penfield’s African American Cemetery in the future, or what steps will be required in order to take advantage of these funds.

It is my hope that this thesis might contribute to achieving the numerous preservation goals for Penfield, whether that be in guiding where preservation efforts are concentrated, contributing to the allocation of resources toward Penfield’s revitalization, or to bringing visibility to the space through the Digital Drawer collaborations. This work should ultimately increase access to resources for Penfield’s preservation and should inspire and guide future efforts to document the history of Penfield, its African American community, and other underserved and marginalized spaces in the future.

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