Archaeological and Forensic Research in Support of the 1921 Tulsa Race Massacre Graves Investigation:

The 2022-2023 Field Seasons at Oaklawn Cemetery

compiled by

Kary L. Stackelbeck
Phoebe R. Stubblefield
Amanda Regnier

Volume I

Report submitted to the City of Tulsa
by the
Oklahoma Archeological Survey,
University of Oklahoma,
and the
C.A. Pound Human Identification Laboratory,
University of Florida

ARCHAEOLOGICAL AND FORENSIC RESEARCH IN SUPPORT OF THE 1921 TULSA RACE MASSACRE GRAVES INVESTIGATION:

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A Moment of Caution

Dear Reader,

In the pages to follow, you will encounter images of the artifacts and lives of past people, who lived and died in the late 1800s to early 1900s Indian Territory/Tulsa. These images are of skeletal remains, personal effects, and artifacts exposed while searching for individuals buried in connection with the 1921 Tulsa Race Massacre. If viewing such evidence of past lives will be emotionally or spiritually contaminating, or violates a cultural rule, please do not proceed.

In a forensic context, and often an archaeological one, is typical for images of the human remains to be included in the analytical report of those remans, so images are included here. We as a research team have gone to great lengths to be respectful to these individuals by shielding them from view in the field and the lab, prior to this report. Many of the images here are distant views, close-ups, or views of partial anatomy, in order to limit the comprehensive exposure of these decedent contributors. As is required for a report of this kind, these images are released to the relevant family—the City of Tulsa. Please view these images with the respect you would want shown to yourself as a decedent contributor to this investigation. These individuals may acquire identities and histories as we go forward, and respect shown to these decedents will hopefully become respect shown to their families.

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CHAPTER 1

INTRODUCTION

Kary L. Stackelbeck, Ph.D. and Phoebe R. Stubblefield, Ph.D.

This report presents the results of the archaeological and forensic research conducted in support of the 1921 Tulsa Race Massacre Investigation during the 2022 and 2023 field seasons in Oaklawn Cemetery. This research was conducted by an interdisciplinary team of specialists from the Oklahoma Archeological Survey (OAS), C. A. Pound Human Identification Laboratory (University of Florida), Stantec Consulting Services, Inc., Oklahoma Office of the Chief Medical Examiner, University of Oklahoma, University of Tulsa, San Diego State University, and Texas State University (among others) with support from—and on behalf of—the City of Tulsa and community members. This work is an extension of previous phases of the investigation as coordinated with the Public Oversight Committee in various public meetings between July 27, 2019 and June 21, 2022. A fuller discussion of that process is found in Stackelbeck, Stubblefield, and Ellsworth (2022:1-2) and on the City's website dedicated to the investigation:

https://www.cityoftulsa.org/1921graves.

From the outset of the re-opened investigation to locate Massacre victims, several locations were identified as potential targets within Oaklawn Cemetery based on the limited available historic records and oral historic accounts, including the: Sexton Area; Original 18 Area; and Clyde Eddy Area (Figure 1.1). Over the course of

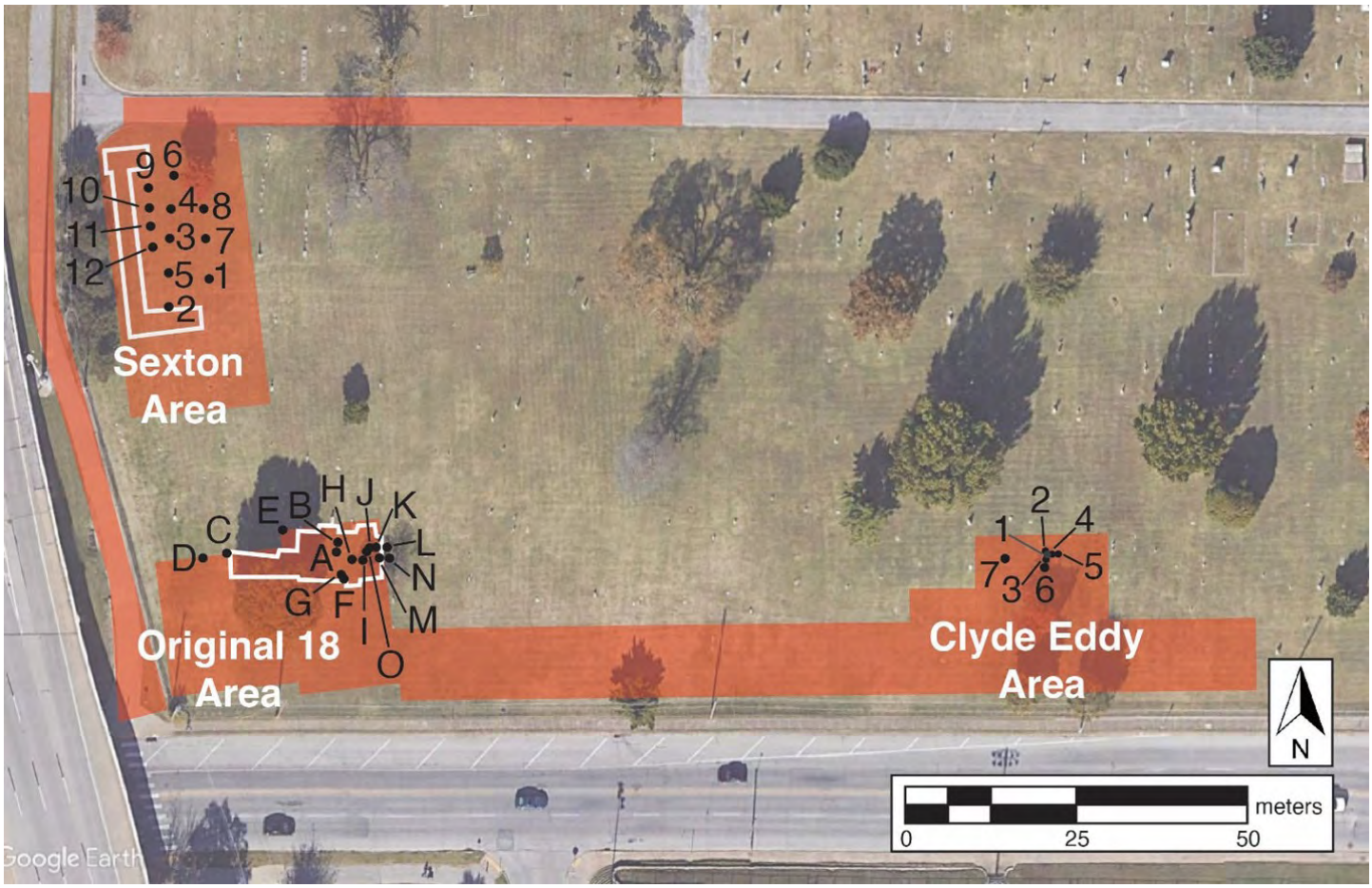


Figure 1.1. *Aerial image displaying the three target areas in Oaklawn cemetery where previous geophysical survey, soil coring, and test and block excavations have been completed (2019-2021).*

several previous mobilizations, the investigative team utilized remote sensing, the extraction of soil core and auger samples, test excavations, and/or block excavations to systematically examine subsurface deposits at each of these locations. The results of these prior efforts are presented in a comprehensive technical report (Stackelbeck and Stubblefield [compilers] 2022) and various meetings, presentations, and press conferences that are archived on the City's 1921 Graves website:

https://www.cityoftulsa.org/government/mayor-of-tulsa/1921-graves-investigation/committee-meetings-and-members/.

The most critical findings from these earlier efforts include:

1) The Original 18 victims were likely interred in singular graves interspersed amongst non-massacre victims;
2) The location identified as the Clyde Eddy Area in Section 19 during the 1999 investigation (Brooks and Witten 2001:140-142) does not contain evidence of disturbed soils that are otherwise consistent with a trench-style mass grave;
3) No trench-style mass grave or individual burials were identified in the Sexton Area; and
4) Section 20 of Oaklawn Cemetery has undergone tremendous changes in land use and episodes of fill deposits since its establishment creating substantial challenges to remote sensing and other standard methods employed to locate clandestine graves, as well as impacting preservation of the skeletal remains and their burial contexts.

Despite these challenges, our investigative team successfully located and documented a gunshot victim, Burial 27, who was carefully exhumed and examined in on-site forensic analysis, along with six other individuals consistent with the target profile—adult males in simple wooden caskets (Burials 3, 9, 15, 17, 19, and 30) (Figure 1.2).

2022-2023 Field Seasons

The 2022-2023 archaeological excavations were conducted under the direction of Kary Stackelbeck (OAS) and Ryan Peterson (Stantec). Remains recovered from Blocks B, D, and E (Figure 1.3) were examined in the on-site forensic laboratory under the direction of Phoebe Stubblefield. The on-going DNA analysis is under the direction of Daniel Hellwig (IMF) and Alison Wilde (IMF) is directing the genetic genealogical research.

Using the results of the earlier efforts—particularly the 2021 excavations and forensic evaluations—we proposed and completed expansions of the excavation area to increase the likelihood of encountering other individuals who fit our target profile. Excavation Blocks B and C were completed in October 2022; Block D was excavated in September 2023 (Figure 1.2). Monitored mechanical excavation of the overburden revealed multiple unmarked graves in each of these new blocks. This step was followed by hand-excavation of individual graves. None of the burials in Block C appeared to fit the search criteria and several likely post-date the Massacre.

Beyond these excavations in the Original 18 Area, the investigative team also pursued another lead associated with the Clyde Eddy Area as recounted by the eyewitness to Dr. Stubblefield in 2005. The location is different than that which he apparently described to members of the previous investigative team in 1999 (Ellsworth 2001; 2022:13; Snow 2001:121) and was subjected to geophysical surveys (Brooks and Witten 2001; Witten et al. 2001; see Figures 1.1 and 1.3). Unlike this other location, Mr. Eddy took Dr. Stubblefield to a position in Section 20 (rather than Section 19) and related his observations of crates that contained multiple decedents being prepared for burial in Oaklawn Cemetery two days after the Massacre (Snow 2001:121). This new area was the focus of additional geophysical survey in the spring of 2023 (Appendix B), limited test excavations in July 2023, and expanded block excavations (Block E; Figure 1.3) in September 2023. No evidence of a mass grave feature was detected in Block E; however, four graves that fit the search parameters for the Original 18 Area were documented and the individuals were exhumed for further analysis.

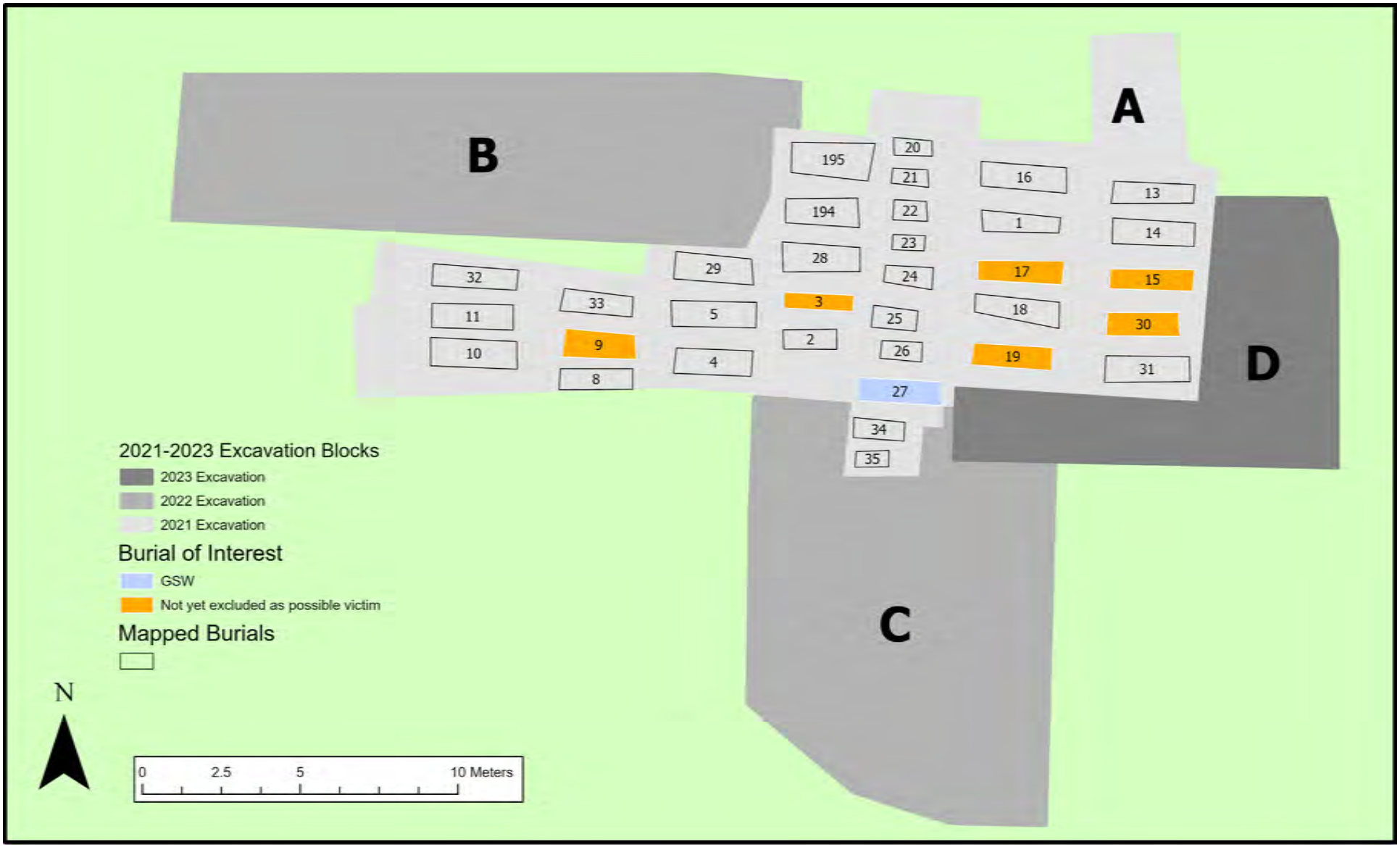


Figure 1.2. *Map of Excavation Blocks A-D; also shown are the graves documented in Block A in 2020, including Burial 27 who was a gunshot victim, and six other burials of interest.*

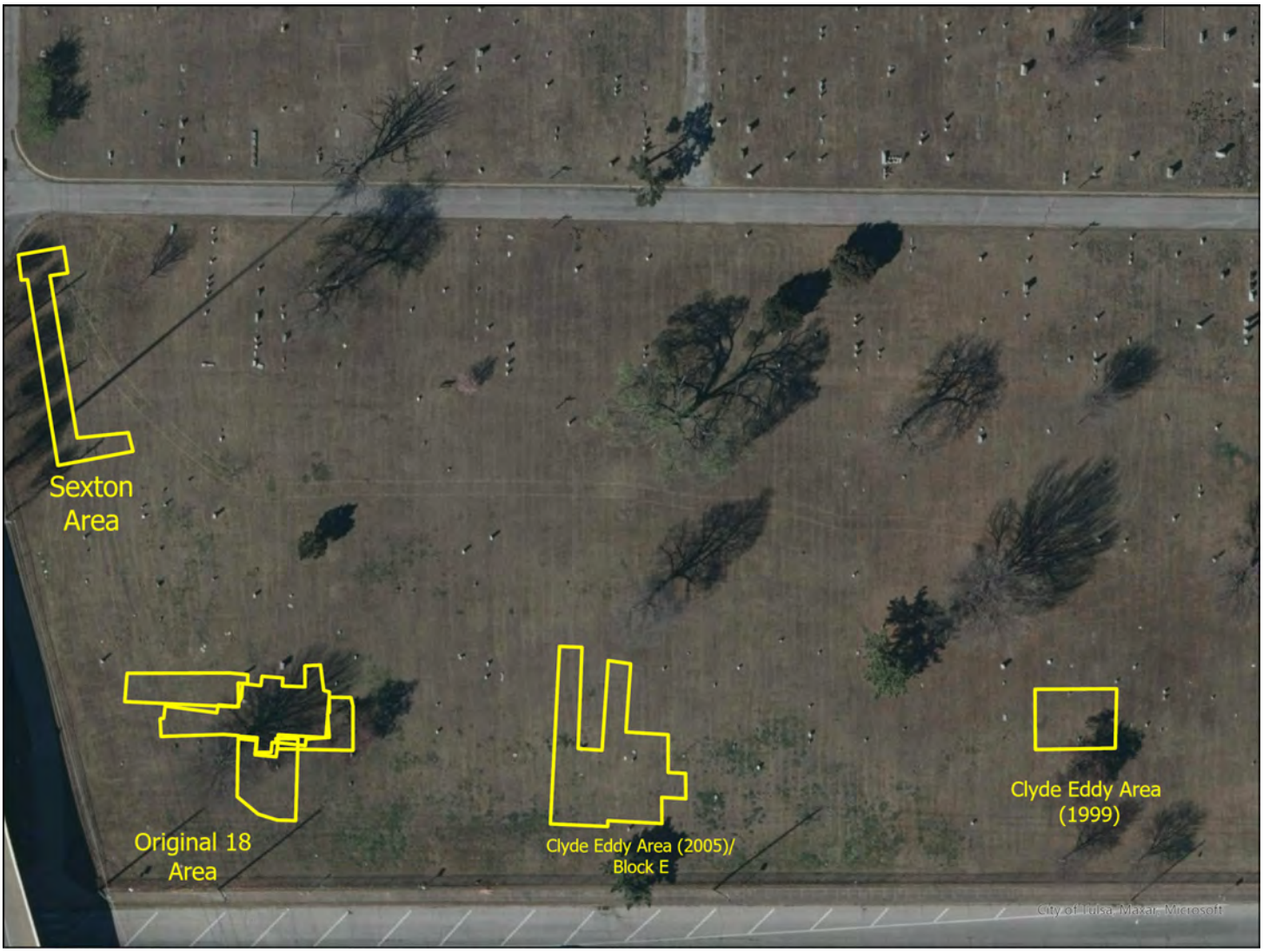


Figure 1.3. *Aerial image of Oaklawn Cemetery showing the outlines of excavation areas from 2020-2023, including the Clyde Eddy Area as indicated to researchers in 2005 (Section 20), as well as the location he pointed out in 1999 (Section 19) where soil core samples were extracted in 2020 (Green et al. 2022).*

This report presents the results of the combined fieldwork and laboratory analyses from the 2022-2023 phases of the investigation in Oaklawn Cemetery. The document is organized to present a summary of additional geophysical survey and the archaeological excavations (Chapters 2 and 4 and Appendices A and B), specialized analyses of recovered artifacts (Chapter 3 and Appendices A and C-F), osteological report of exhumed remains (Chapter 5), and overall findings and recommendations for next steps in the investigation to locate additional Massacre victims (Chapter 6). This report is a more exhaustive treatment of the results presented in the *Executive Summary*, which was submitted to the City in July 2024 (Stackelbeck and Stubblefield [compilers]).

CHAPTER 2

SUMMARY OF ARCHAEOLOGICAL TESTING AND BLOCK EXCAVATIONS

Kary L. Stackelbeck, Ph.D. and Debra Green, Ph.D.

Each phase of this investigation since 2019 has yielded information that was not previously known or was poorly understood about Oaklawn Cemetery from the limited available documentation. The accumulation of data from previous phases of fieldwork—particularly the excavations of 2020-2021—informed our team's recommendations for the expansion of excavations in Section 20 for the 2022 and 2023 field seasons. The results of earlier excavations and forensic analyses are presented in a detailed technical report (Stackelbeck and Stubblefield [compilers] 2022).

Among the results of the earlier phases of excavations was the recovery of a trauma victim (Burial 27) who had been shot at least three times from the front in his face and left shoulder (Stubblefield 2022:218-219). He was an adult male buried in a simple wooden casket. His grave had been placed in a row of infants—perhaps intruding into and through the grave of one infant such that it was deeper than the surrounding burials. In the vicinity of this individual were several other burials of interest, including adult males buried in simple wooden caskets (see Figure 1.2) and the markers for two known Massacre victims—Reuben Everett and Eddie Lockard. Under the assumption that Massacre victims would be buried in proximity to one another, we expanded excavations in this area (Blocks B-D) in 2022 and 2023 to determine if other individuals who fit our target profile are present.

Excavation of an additional area (Block E) was conducted to further explore a lead provided to our investigative team by Clyde Eddy, an eyewitness who observed crates containing multiple African American decedents presumably awaiting burial in a nearby trench while walking through Oaklawn Cemetery two days after the Massacre. In 1999, Mr. Eddy identified the location of interest to the researchers at that time as being in Section 19 (Ellsworth 2001; 2022:13; Snow 2001:121). Geophysical survey conducted by Witten and Brooks (2001) indicated an anomaly that they believed could correlate to a mass grave akin to the trench described by Mr. Eddy. They recommended this location for further testing (Brooks and Witten 2001:42). More recently, OAS conducted a new geophysical survey, which affirmed the presence of an anomaly (Hammerstedt 2022:5). This location was examined by our team in 2020 using hand-held augers and mechanical soil cores to evaluate the potential source of the anomaly (Green et al. 2022:60). The results did not support the presence of a mass grave feature.

A different—but nearby—location of interest was pointed out by Mr. Eddy to Dr. Stubblefield in 2005. This location was subjected to additional geophysical survey (Appendix B, this volume), test excavations, and block excavations during the 2023 field season.

This chapter describes the expanded excavations conducted in 2022 and 2023 in Oaklawn Cemetery in both the Original 18 Area and the second Clyde Eddy Area and what they revealed about the presence of burial features and their context. Fuller description of the burials and the resulting osteological and other specialized analyses are provided elsewhere in the report (Chapters 4 and 5, Appendices A and C-F).

Excavation Methods

As with previous field seasons, the excavation process began with the mechanical removal of overburden while archaeologists monitored for artifacts, skeletal remains, and changes in soil color (Figure 2.1). Each backhoe row was labeled to provide an approximate grid location for the recovery of artifacts from the overburden. Identification and analysis of the non-mortuary artifacts recovered during this monitoring phase are presented in Chapter 3 of this volume.

Photographs and drawings of representative profiles of the walls of the excavation blocks were recorded as the mechanical excavation progressed. Geoarchaeological descriptions of these profiles provides an understanding of the depositional context of the cemetery, including the characteristics of the soils that underlie the grave shafts, those that surround the burials, and those that were placed over the graves in successive fill episodes after interment (Green et al. 2022). Summaries of the geoarchaeological assessments for each of the new excavation blocks are presented further below, with a more comprehensive treatment in the forthcoming technical report of the 2024 investigations (Green *np*).

Upon reaching a depth at which the graves were apparent, the corners of each shaft feature were mapped in with a total station and the excavation process shifted to teams of Stantec archaeologists using hand-held tools to conduct more detailed exposure of the containers and the hardware (if present) (Figure 2.2). Among the graves that were considered to potentially fit our profile of Massacre victims, the hand excavation process further entailed: 1) exposure of the human remains; 2) detailed documentation, including 3-D photogrammetry; 3) recovery of samples of wood from the container and lid (if present); and 4) documentation of projectiles, personal effects, and/or grave goods (if present and observable). Hand-excavated soil was screened to increase recovery of smaller artifacts and fragments of human remains (Figure 2.3). Detailed descriptions of this finer-grained excavation process and the documentation of each grave are presented in Appendix A of this document. The documentation and mapping processes are consistent with those described in Appendix C of the technical report of the 2020-2021 fieldwork (Peterson et al. 2022:2-15).

Upon determination by the forensic team that a given burial was an appropriate candidate for exhumation (typically an adult male in a simple wooden casket), excavators stabilized the remains and prepared them for removal to a specialty cardboard container, most commonly used as a cremation tray (Figure 2.4). Each container with exhumed remains was carefully and respectfully transported to the on-site forensic laboratory (Figure 2.5). Detailed results of the forensic assessments are presented in Chapter 5 of this volume.

Figure 2.1. *Archaeological monitoring of mechanical removal of the overburden above the burials in Section 20 of Oaklawn Cemetery (Image courtesy of the City of Tulsa).*

Figure 2.2. *Stantec crew members conducting hand excavations of burials in Block E (Image courtesy of the City of Tulsa).*

Figure 2.3. *Stantec crew members screening hand-excavated soil from burials in Block E (Image courtesy of the City of Tulsa).*

Figure 2.4. *Archaeological team members prepare to transport the remains of an exhumed individual from Excavation Block E to the on-site forensic laboratory (Image courtesy of the City of Tulsa).*

Figure 2.5. *Respectful transfer of remains from the excavation area to the on-site forensic laboratory (Image courtesy of the City of Tulsa).*

Excavation Blocks B-D

Excavation Blocks B and C were completed in October 2022 and measured 62.5 square meters (672.74 square feet) and 73 square meters (785,77 square feet), respectively. Block D, measuring 52 square meters (559.72 square feet) was excavated in September 2023 (Figure 2.6).

Stratigraphic profiles observed in Blocks B-D support previous geoarchaeological assessments indicating the presence of a relict stream channels along the south and west sides of the cemetery (Green et al. 2022). Most of the graves documented in these excavation blocks are within fill that was artificially introduced to intentionally create useable space for burials in otherwise swampy, low-lying areas.

Forty graves were recorded in Blocks B-D, all but one of which were unmarked. Eight individuals from unmarked graves in Block B and three individuals from unmarked graves in Block D were exhumed and analyzed in the on-site forensic laboratory. None of the burials in Block C fit our profile for exhumation; several are in very good condition and appear to likely post-date the Massacre.

Clyde Eddy Area (2005): Block E

In 2005, Clyde Eddy recounted his observations of a trench in Oaklawn Cemetery and several crates containing the remains of African American decedents—ostensibly being prepared for interment within the large grave shaft. The location indicated by Mr. Eddy in this account was further to the west of the location he had previously pointed out to researchers (see Figure 1.3, Figure 2.7). Mr. Eddy stood in this same location when he was interviewed by reporters—including Kavin Ross—in the 1990's (Figure 2.8). He indicated a general area where he observed the crates, not a specific pinpointed location. With assistance from descendant and community member, Ms. Brenda Nails-Alford, OAS conducted a new geophysical survey between May 9 and June 7, 2023 (Figure 2.9) that broadly covered the overall area, resulting in the detection of a suspicious anomaly (Figure 2.10; Appendix B, this volume).

On July 13, 2023, the archaeological team conducted limited test excavations to determine the nature of the anomaly. In the process, we uncovered two rows of makeshift burial markers (mostly singular upright bricks) and underlying graves that appeared to be intact, though the exact source of the geophysical anomaly remained a mystery (Figure 2.11). The team returned in September of 2023 to expand on the test excavations, ultimately encompassing Block E (Figure 2.12). Fifty graves were documented in this block, only three of which had associated markers visible on the ground surface at the time of excavation. Four individuals from Block E were exhumed for forensic examination (see Figures 2.4, 2.5, and 2.12): Burials 79, 84, 95, and 101.

Landscape History Evident in Block E

Geoarchaeologist, Debra Green, led previous efforts to evaluate the stratigraphy in Oaklawn Cemetery and understand how it correlated with the history of landform development over time. Evidence was observed indicating the presence of two intermittent, relict stream channels: one along the western side of the cemetery and the other along the southern edge. The presence of these relict stream channels "resulted in a continuous, poorly drained wetland across the entire southern and western edge of Oaklawn cemetery" (Green et al. 2022:79). In order to expand the serviceable space within Section 20 for burial placement, "clayey fill was brought in to fill in these two streams and raise the land surface above the high-water table" (ibid). Presumably, this correlates with the establishment of the New Potters Field, as depicted in a 1917 map of the cemetery (Figure 2.13).

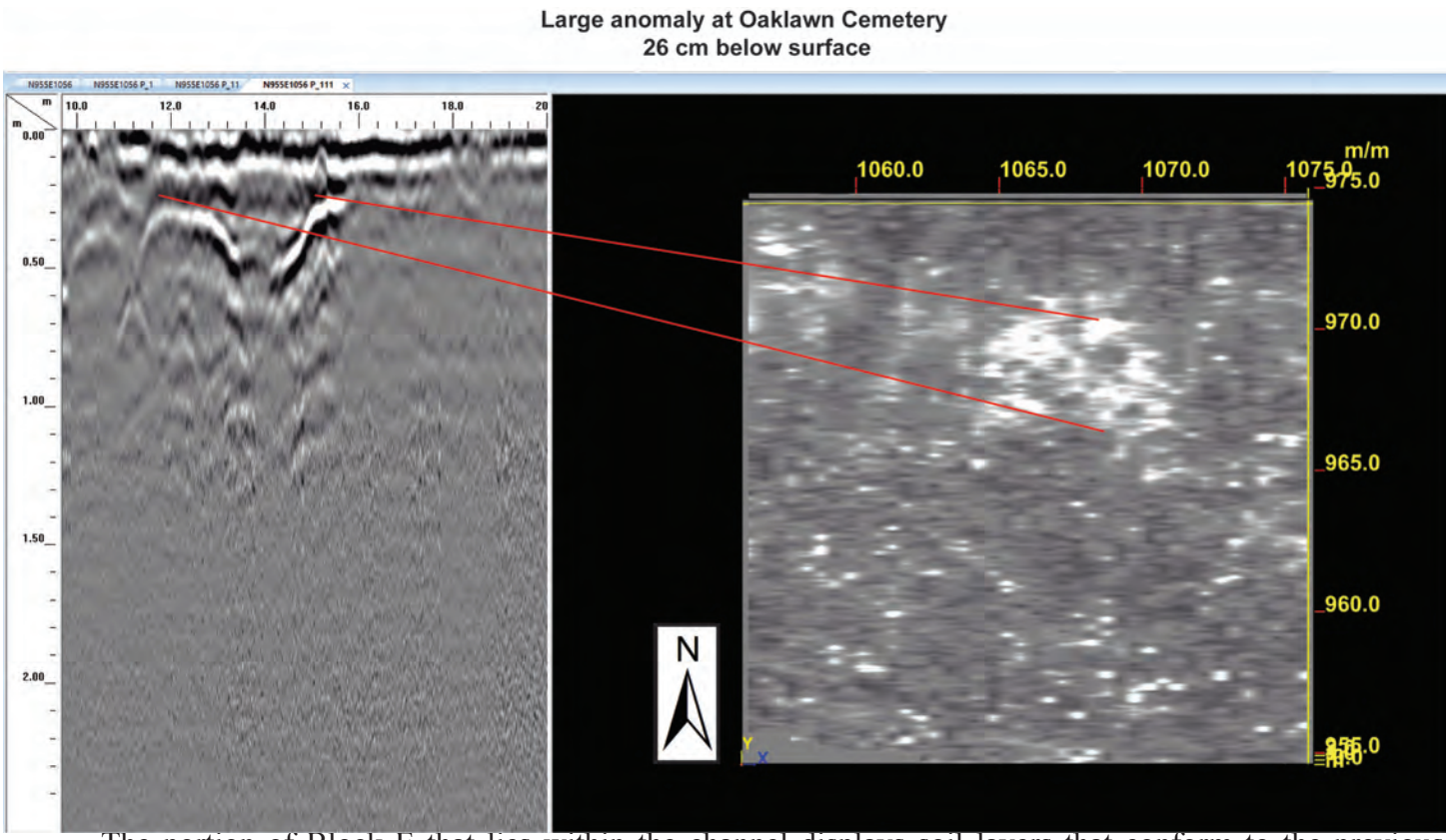
Further modification of the landscape occurred with multiple episodes of additional fill placement over the burials, which "was deposited homogenously across the entire southwestern portion of the cemetery (Green et al. 2022:80)—ultimately resulting in the landform being raised to its modern level. The 2023 investigations in Block E affirm those interpretations and provide additional information on the landform that is north of the southern relict stream channel.

***Figure 2.6**. Map of Excavation Blocks A-D displaying the distribution of newly mapped burials from the 2022-2023 field seasons.*

Figure 2.7*. View to the north as taken from the Clyde Eddy Area as conveyed to Phoebe Stubblefield in 2005 (left; image courtesy of Phoebe Stubblefield) and as taken from the location of the geophysical anomaly and test excavations in 2023 (right; image courtesy of Angela Berg). Note the distinctive diamond-shaped headstone to the right of the tree in each image and the park bench in the image on the right.*

Figure 2.8*. Clyde Eddy being interviewed (late 1990's?) as he describes his eyewitness account while standing near the location (video footage courtesy of Kavin Ross). Note the park bench visible upslope over Mr. Eddy's right shoulder..*

***Figure 2.9**. Brenda Alford (descendant) and Scott Hammerstedt (OAS) collecting Ground Penetrating Radar (GPR) data on June 7, 2023.*



The portion of Block E that lies within the channel displays soil layers that conform to the previous

***Figure 2.10**. Large anomaly detected by GPR in the new Clyde Eddy area.*

Figure 2.11. *Careful test excavations on July 13, 2023 in the area of the GPR anomaly monitored by representatives from OAS, Stantec, OCME, and the Public Oversight Committee. Note the two rows of makeshift markers, which are tagged with orange tape on either side of the backhoe trench.*

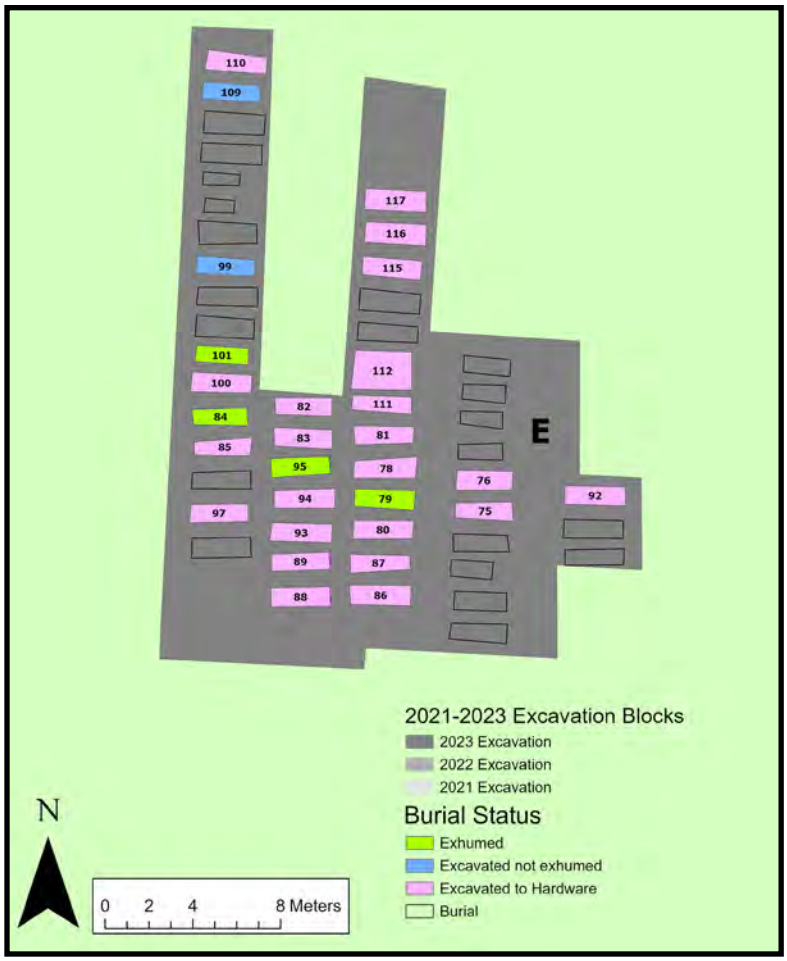


Figure 2.12. *Map of Excavation Block E displaying the distribution of newly mapped burials from the 2023 field season.*

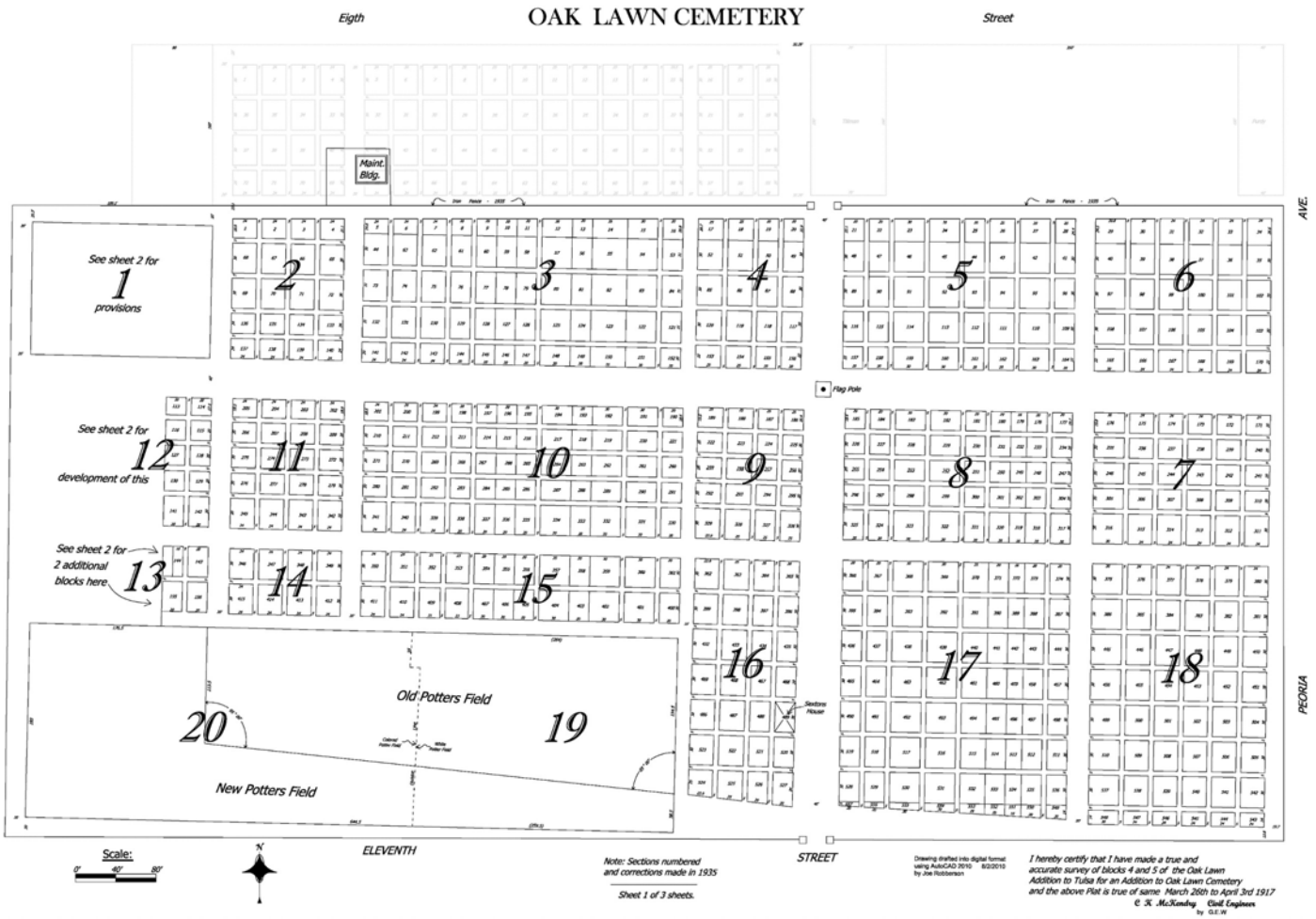


Figure 2.13. *Portion of a replica of 1917 map of Oaklawn Cemetery; note the division line between the "White" and "Colored" Potter Fields, displayed here as Sections 19 and 20, respectively (image courtesy of the City of Tulsa).*

assessment by Green and others (2022). Specifically, we discovered evidence of fill that was presumably brought in to build up the low-lying swampy channel and create space that was useable for the placement of burials, which were then capped by at least four episodes of additional fill (Green np).

Block E also includes two parallel extensions that were excavated to north and upslope from the relict stream channel (see Figure 2.12). The stratigraphic profiles in these areas reflect a weathered Pennsylvania shale residuum landform. There are stark differences in the texture and color of the deposits in these excavation areas compared to the portion of the block further to the south (Green np). As with the other portions of Block E, burials were documented throughout these northern extensions (see Figure 2.12).

Beyond interment of the graves and evidence for continued management of the swampy conditions, other human activity is evident through the placement of markers that post-date the original graves with which they are associated. Expedient make-shift markers consisting of individual upright bricks (N = 20), a flower pot, one dressed stone, and two milk glass slab fragments (Figure 2.14) were discovered beneath about 30-50 cm of fill in association with 23 of the graves in Block E. The expedient markers were placed sometime after the interment of the burials but before the last episodes of fill that ultimately covered them from view.

Sizable areas of the fill that covered these expedient markers consisted of red sand (see Figure 2.11). Indeed, upon fully exposing the layer at the depth of these markers in Block E, we observed that an area of red sand and other fill dirt that was artificially dumped in this location corresponded to the GPR-detected anomaly that is discussed further in Appendix B of this volume (Figure 2.15). No evidence for a trench-style mass grave feature was observed in Block E.

***Figure 2.14**. View of Excavation Block E (facing north) upon exposure of a row of expedient markers—principally singular upright bricks—which align well with underlying Burials 72-77 but were placed after those interments. The blue circle demarcates an area of red sandy fill.*

***Figure 2.15**. View of Excavation Block E upon exposure of an area of fill that corresponds to a large GPR-detected anomaly (Appendix B, this volume).*

The source of the bricks used to mark several of these graves is unclear, but they appear to be consistent with those that are found in a feature that was exposed in the south wall of Block E near Burial 71 (Figure 2.16). It is possible that someone familiar with the cemetery and presence of otherwise unmarked graves in this part of the Potter's Field may have taken it upon themselves to place expedient markers at/near the heads of numerous graves out of respect.

Summary of Excavations and Known Burial Population

Excavation Blocks B-E encompassed a total of 5936.3 square feet (551.5 square meters) (Figure 2.17). Upon completion of the 2022 and 2023 phases of fieldwork, an additional 90 graves were documented in Section 20 (see Figure 2.17). Descriptions of these graves are presented in Appendix A. Thirty-five of these graves were mapped but not excavated as they were: 1) of a subadult size; 2) in an area where the conditions were challenging for the recovery of remains (e.g., northern parts of Block E); 3) in an area where burials appear to likely post-date the Massacre; or 4) only partially exposed in the excavation block (e.g., southern half of a burial that was visible in the wall but not sufficiently exposed to allow for excavation at that time).

Hand excavations were initiated on 25 of these graves but terminated upon observation of decorative casket hardware, which was an indication that the container was not of the simple wooden form that otherwise fit our search parameters. Little if any human remains were exposed in these 25 burials and they remain intact.

The remains of 15 individuals in Blocks B-E were exposed by hand excavations but left *in situ* upon the observation of personal effects and/or coffin hardware that did not fit our search parameters and/or in-field assessment that identified them as females.

The remaining 15 individuals were exhumed and sent to the on-site forensic laboratory for further analysis (Figures 2.6, 2.12, and 2.17). Detailed descriptions of the excavation process, shaft dimensions, casket dimensions, and associated artifacts are presented in Appendix A, along with an initial description of the condition of the remains and detailed photo-documentation. The documentation process allows for 3-D rendering of the burials

***Figure 2.16**. Profile of a section of the south wall of Excavation Block E south of Burial 71 where a brick-lined feature was documented. Note the presence of bricks near the surface and at the base. Mortar is present on several of the bricks. These are similar to individual bricks uncovered in rows to the north that appear to be used as expedient burial markers (see Figure 2.14).*

after excavation but prior to exhumation. The results of the osteological analysis of these individuals are presented in Chapter 5.

Abundant artifacts recovered from the fill layers below, among, and above the graves in Section 20 provide substantial information regarding the context and approximate timeframe of the burials. Analysis of these non-grave goods is presented in the following chapter.

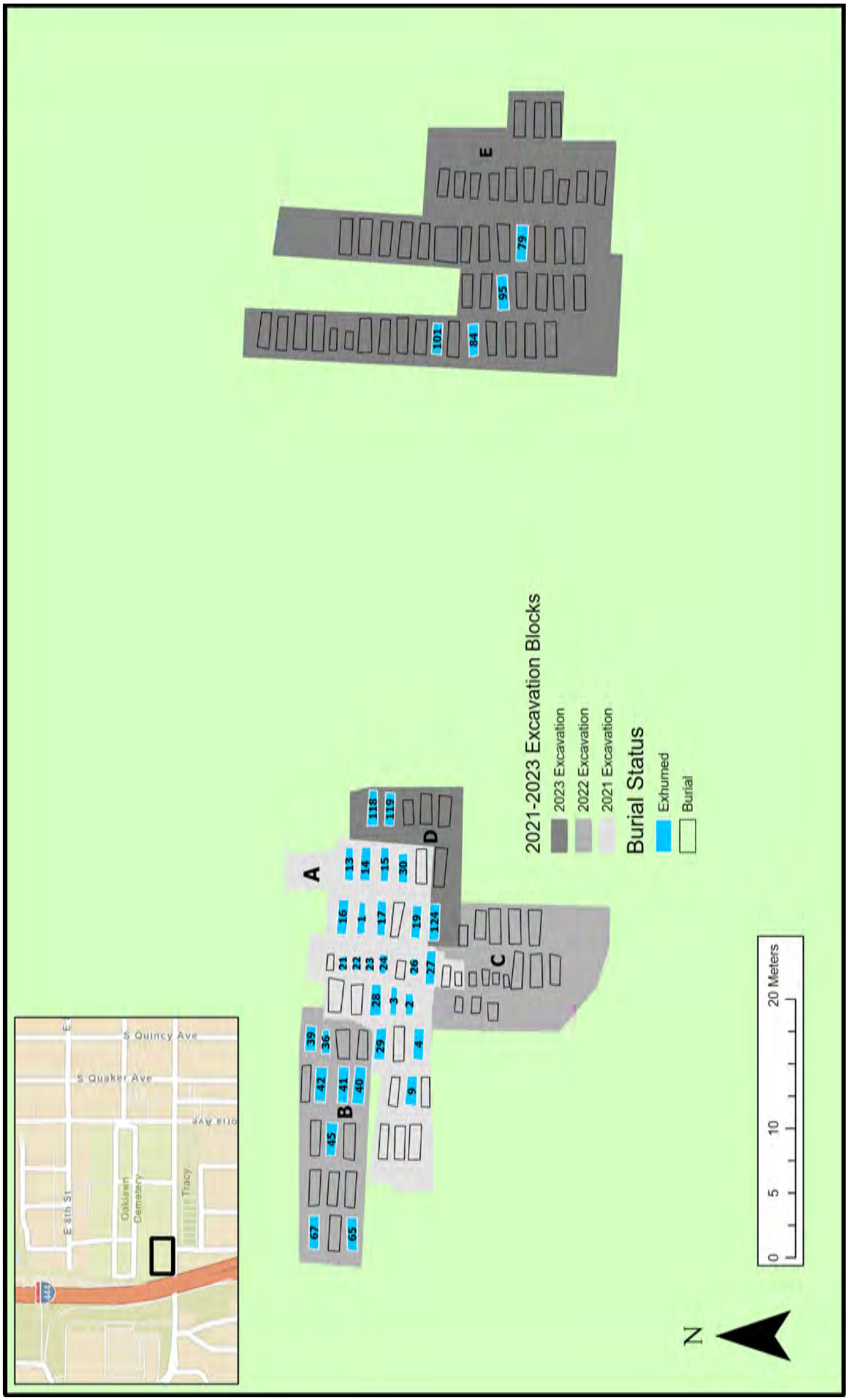


Figure 2.17*. Map of Excavation Blocks A-E displaying the distribution of burials that were exhumed for further analysis during the 2020-2023 field seasons.*

CHAPTER 3

NON-MORTUARY ARTIFACTS FROM THE 2022 AND 2023 EXCAVATIONS AT OAKLAWN CEMETERY

Amanda L. Regnier, Ph.D.

This chapter presents the results of the analysis of the 8,476 artifacts not associated with graves recovered during the 2022 and 2023 excavations in Oaklawn Cemetery. In addition, this chapter will incorporate data from the 1,858 artifacts recovered from the 2021 excavation area to characterize the entire artifact assemblage from the excavated areas. The artifacts from both the trench excavations are associated with: (a) occupation of the area as an allotment; (b) the use of the area as a refuse dump before Oaklawn became a cemetery, (c) activities in Oaklawn Cemetery during the early to mid-20th century, and (d) the use of soils from other archaeological sites as fill to raise the elevation of the southwest corner of the cemetery during the early 20th century. This chapter includes a description of recovery and analysis methods for four categories of artifacts - ceramics, glass, metal, and other materials. The artifact analysis focuses on (a) the spatial distribution of artifacts across the excavation trenches, (b) the time periods represented by these artifacts, and (c) what the types of recovered artifacts indicate about the use of this area of Oaklawn Cemetery through time.

Recovery and Analysis Methods

Artifacts were recovered in several ways. Most were collected opportunistically as they were exposed when they were spotted by archaeologists monitoring the backhoe. The locations of backhoe passes were tracked via a sketch map of the trench maintained in the laboratory trailer. Artifacts from different areas were assigned to separate catalog numbers. The sketch maps showing the catalog number locations for both areas, Trenches A – D and Trench E (Figures 3.1 and 3.2), were digitized to allow for analysis of the density of non-mortuary artifacts across the trench. Artifacts also were recovered either by hand or in screened soil during excavation of individual graves. Those catalog numbers are also included on the maps. Significant artifacts were collected from the backhoe back dirt piles; those artifacts are not included in the density distribution maps discussed later in this chapter.

Each backhoe context was assigned a catalog number in the field, and artifacts were placed in bags by this number. Analysis of the 2022 artifacts was completed during the field season. The retained artifacts were returned to the Oklahoma Archeological Survey laboratory in Norman for photography, repackaging for long-term curation, and labeling. Roughly a third of the much larger assemblage of artifacts from the 2023 field season were washed in the field with water and toothbrushes, dried on drying racks, and returned to the Oklahoma Archeological Survey laboratory in Norman for analysis. The remaining artifacts were transported to the laboratory in Norman, where they were washed by undergraduate laboratory assistants and then analyzed, photographed, repackaged for curation, and labeled. During analysis, the artifacts were sorted into four categories: ceramics, glass, metal, and other materials, including architectural materials and faunal remains. Artifact data was entered into a Microsoft Access database on a laptop during analysis.

Table 3.1 provides a breakdown of the recovered non-mortuary artifacts by the four major analytical categories from the three excavation seasons. The 2020 artifacts from the Sexton Area excavations and the 2021 excavations were described in the previous report of excavations (Regnier 2022, Regnier et al. 2022). The counts from the 2021 excavations are included in this chapter because Trenches A – D are contiguous. Glass made up the largest portion (44 percent) of the recovered artifacts from all three seasons. Metal was the largest category in

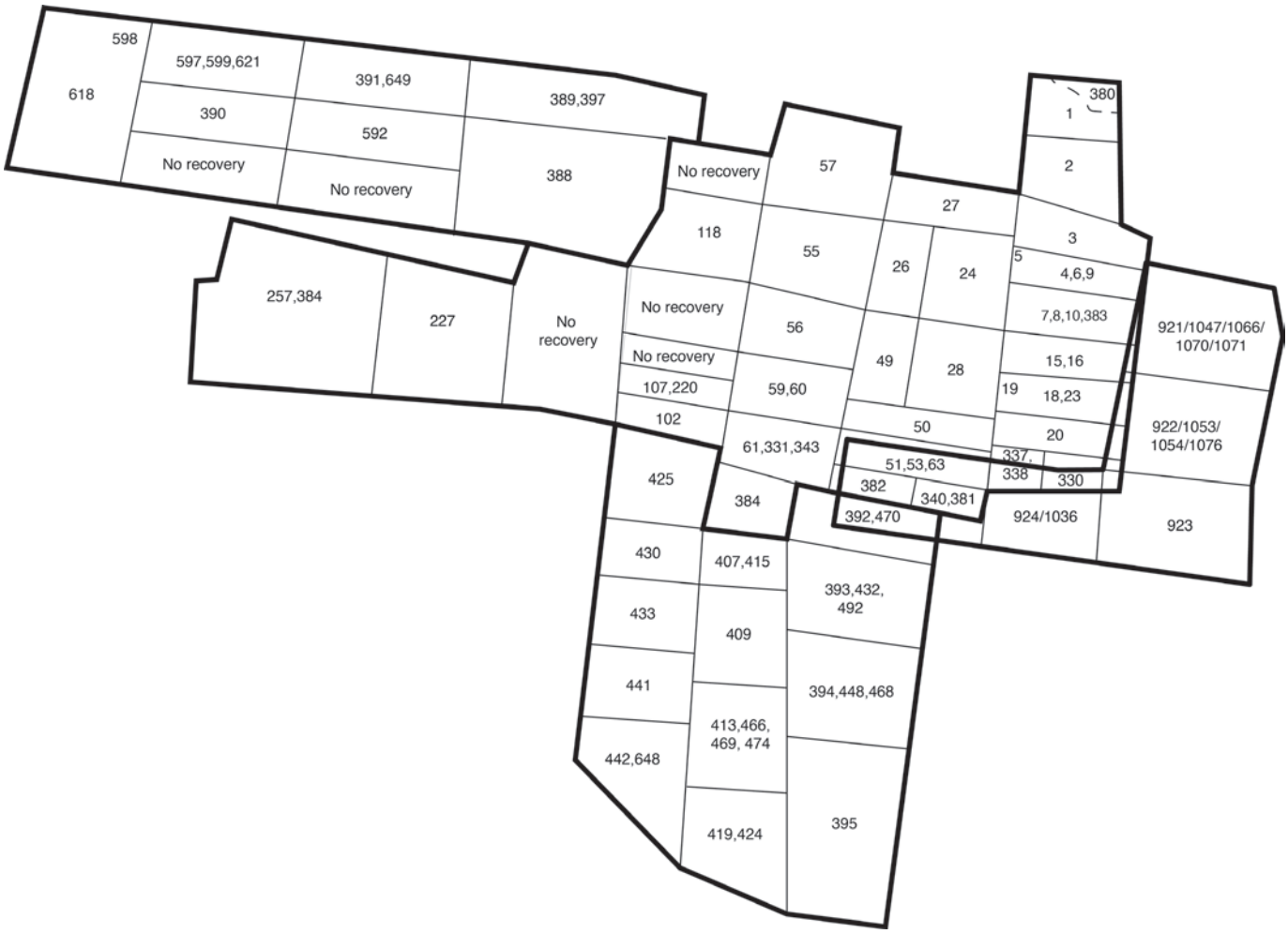


Figure 3.1. *Map of catalog number locations from the 2021 – 2023 Trench A – D excavations.*

Figure 3.2. *Map of catalog number locations from the 2023 Trench E excavations. Shallow context are on the left and deep contexts are on the right.*

Table 3.1. Artifacts recovered during the three Oaklawn excavation seasons by category.

Excavation Season	2021 Excavations				2022 Excavations				2023 Excavations				Total			
	Count	%	Weight (g)	%	Count	%	Weight (g)	%	Count	%	Weight (g)	%	Count	%	Weight (g)	%
Ceramics	347	18.7	8246.9	16.5	101	9.3	1085.9	9.9	913	12.4	4108.6	19.0	1361	13.2	13441.4	16.3
Glass	534	28.7	13625.5	27.3	674	62.2	4515.0	41.0	3280	44.5	10453.9	48.5	4488	43.6	28594.4	34.7
Metal	972	52.3	27854.2	55.8	289	26.7	4019.8	36.5	2915	39.6	4634.7	21.5	4176	40.5	36508.7	44.3
Other Materials	5	0.3	161.4	0.3	20	1.8	1383.5	12.6	255	3.5	2376.0	11.0	280	2.7	3920.9	4.8
Total	**1858**	**18.0**	**49888.0**	**60.5**	**1084**	**10.5**	**11004.2**	**13.3**	**7363**	**71.5**	**21573.2**	**26.2**	**10305**	**100.0**	**82465.4**	**100.0**

the 2021 field season, making up over 56 percent of recovered artifacts. Metal dropped to 26 percent of the 2022 artifacts and 40 percent of the 2023 artifacts. This was due to a change in recovery strategy; during the 2022 and 2023 field seasons, unidentifiable pieces of ferrous metal were collected less frequently since they provide little valuable information.

As with previous excavations at Oaklawn, only a portion of the recovered and analyzed artifacts were retained for curation. Artifacts not retained and repackaged for curation were either reburied when the excavation trenches were backfilled at the conclusion of the field seasons or were retained for reburial at a later time. Reburied artifacts consist primarily of undecorated and molded ceramics, glass without identifying features, fragments of glass containers already retained as whole containers, unidentifiable metal, including heavily corroded ferrous metal and cuprous metal, and unmarked architectural debris. Table 3.2 shows the reburial rates by artifact category and field season. Most of the artifacts (87 percent) from all three field seasons were reburied. The artifacts from the 2023 field season had the highest reburial rate at 90 percent. Metal had the highest reburial percentage, with 99 percent of artifacts being reburied. The "Other Materials" category had the lowest because faunal fragments were retained for future analysis. Retention rates dropped for ceramics, metal, and glass over the three field seasons, which is largely a result of efforts to avoid redundancies in the curated artifacts.

Artifacts retained for curation were returned to the Oklahoma Archeological Survey where they were individually photographed, packaged in 4 millimeter thick polyethlene bags with acid-free paper identification tags, and individually labeled with small 100% cotton bond paper tags adhered with curation stable B72 resin. All retained artifacts are ready for curation and will be sent to a yet-to-be-determined facility in Tulsa for long-term storage along with printed copies of the reports and artifact catalogs and digital versions of the photographs and analysis databases.

Table 3.2. Counts and percentages of reburied artifacts by material category from each field season.

Material Type	2021 Field Season				2022 Field Season				2023 Field Season				Total			
	Total	Kept	Reburied	%	Total	Kept	Reburied	%	Total	Kept	Reburied	%	Total	Kept	Reburied	%
Ceramics	347	160	187	53.9	117	63	54	46.2	913	317	658	72.1	1377	540	899	65.3
Glass	534	150	384	71.9	688	167	522	75.9	3280	706	2942	89.7	4502	1023	3848	85.5
Metal	972	6	966	99.4	290	7	283	97.6	2915	145	2874	98.6	4177	158	4123	98.7
Other Materials	5	1	4	80.0	20	8	12	60.0	255	132	121	47.5	280	141	137	48.9
Total	**1858**	**317**	**1541**	**82.9**	**1115**	**245**	**871**	**78.1**	**7363**	**1300**	**6595**	**89.6**	**10336**	**1862**	**9007**	**87.1**

The Non-Mortuary Artifacts from Trenches A – D

Trench A had the highest quantity of recovered artifacts from the four trenches. Table 3.3 shows the quantity of artifacts by analytical category within the four contiguous excavated trenches. The quantity of artifacts recovered from Trench A was about 12 times greater that of Trenches B, about twice that of Trench B, and nearly 3 times that of Trench D. The Trench A artifact assemblage was 24 times heavier than the Trench B, about 6 times heavier than the C assemblage and about 4 times heavier than the Trench D assemblage. Numerous large heavy chunks of ferrous metal were recovered from the deeply-buried stream soils in the southern portion of Trench A. These artifacts were not present in Trenches B, C, or D.

Table 3.3. Artifacts recovered from Trenches A - D at Oaklawn Cemetery by category.

Excavation Season	Trench A				Trench B				Trench C				Trench D				Total			
	Count	%	Weight (g)	%	Count	%	Weight (g)	%	Count	%	Weight (g)	%	Count	%	Weight (g)	%	Count	%	Weight (g)	%
Ceramics	347	18.7	8246.9	16.5	19	12.8	126.0	6.1	82	8.8	959.9	10.7	156	22.3	3148.7	24.9	620	16.9	12701	16.7
Glass	534	28.7	13625.5	27.3	96	64.4	1048.2	50.7	578	61.8	3466.8	38.8	432	61.7	6987.1	55.3	1654	45.0	25278	33.2
Metal	972	52.3	27854.2	55.8	32	21.5	609.4	29.5	257	27.5	3410.4	38.2	108	15.4	1224.3	9.7	1370	37.3	35339	46.4
Other Materials	5	0.3	161.4	0.3	2	1.3	283.0	13.7	18	1.9	1100.5	12.3	4	0.6	1275.5	10.1	29	0.8	2820	3.7
Total	**1858**	**50.6**	**49888.0**	**65.5**	**149**	**4.1**	**2066.6**	**2.7**	**935**	**25.5**	**8937.6**	**11.7**	**700**	**19.1**	**12635.6**	**16.6**	**3673**	**100.0**	**76138.7**	**100.0**

By count, glass made up the greatest portion (46 percent) of artifacts in Trenches A – D. Glass had the lowest representation in Trench A (27 percent). The larger quantity of glass artifacts from Trenches B – D is somewhat misleading. During the Trench A excavations, which took place in June and July of 2021, the soils were saturated due to rainfall during the preceding spring. The soil moisture allowed the backhoe to easily dislodge complete or nearly complete glass containers. During October 2022 excavations, the Trench B & C excavation soils were very dry after a months-long drought that started in June 2022. The backhoe shattered glass containers lodged in the drier, more compact soil rather than knocking them loose mostly intact. The soil was on the drier side during the September 2023 excavations, but not as dry as 2022. The counts and weights of glass illustrate the differential breakage of glass by excavation trench. The 536 glass artifacts in Trench A weighed in at 13.63 kg, with average mass of 25 g per artifact. The 96 glass artifacts from Trench B weighed 1.0 kg with an average mass of 11 g per artifact. Trench C had a collected mass of 3.47 kg with an average weight of 6 g per artifact. Trench D has the second-highest average mass, with 432 glass artifacts weighing 7 kg, or an average of 16.2 g per artifact.

Ceramics

The ceramic assemblage from the 2022 and 2023 excavations consisted of 19 ceramics from Trench B, 82 from Trench C, and 156 ceramic artifacts from Trench D. Ceramics made up 13 percent of the Trench B, 9 percent of Trench C, and 22 percent of the Trench D artifacts. Ceramics had the lowest reburial rate, with 21 percent from Trench B, 60 percent from Trench C, and 70 percent of the ceramics from Trench D reburied.

The ceramic analysis captured data consisting of ceramic ware type, vessel form and portion, decorative type, color, motif, and field, and approximate date range. Archaeologists use these traits of ceramic artifacts to determine the date, use, and even cost of the recovered ceramics. The preference of styles of ceramic wares and decoration changed over time in response to customer preference and technological innovations. Records from 19th and 20th century pottery producers provide information about when certain types of ceramics were produced. This allows archaeologists to assign relatively narrow ranges of dates of manufacture to certain ceramic types.

Ware Type. Ceramic wares fall into four broad types – refined earthenwares, coarse earthenwares, porcellaneous wares, and stoneware. Table 3.4 provides an inventory of the ceramic assemblage from Trenches A – D by ware type. Ware types are distinguished by characteristics of the clay body and the firing temperature.

Table 3.4. Ceramic ware types recovered from Trenches A - D at Oaklawn Cemetery.

Ware Type	Trench A		Trench B		Trench C		Trench D		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
Whiteware	134	38.6	4	21.1	40.0	48.8	78	50.0	267	43.1
Ironstone/White Granite	67	19.3	1	5.3	5.0	6.1	25	16.0	102	16.5
Refined Earthenware	0	0	0	0	0.0	0	1	0.6	1	0.2
Bisque	5	1.4	0	0.0	1.0	0.0	0	0.0	6	1.0
Porcellaneous Ware	64	18.4	13	68.4	14.0	17.1	18	11.5	108	17.4
Stoneware	46	13.3	1	5.3	11.0	13.4	24	15.4	82	13.2
Yellowware	19	5.5	0	0.0	4.0	0.0	0	0.0	24	3.9
Coarse Earthenware	7	2.0	0	0.0	5.0	0.0	7	4.5	20	3.2
Redware	0	0	0	0	0.0	0	1	0.6	1	0.2
Ceramic Tile	5	1.4	0	0.0	0.0	0.0	1	0.6	7	1.1
Toilet ware	0	0.0	0	0.0	2.0	0.0	1	0.6	2	0.3
Total	**347**	**56.0**	**19**	**3.1**	**82.0**	**13.2**	**156**	**100.0**	**620**	**100.0**

Refined earthenwares are light-colored and high-fired, with a hard, white to off-white ceramic paste. In the late 18th and 19th century, ceramic makers in the United Kingdom experimented with a variety of glazes in their attempts to reproduce the porcelains produced in China and Japan (Samford 2002). Refined earthenwares were imported to America from the UK in massive quantities between the late 18th and 20th centuries. American manufacturers began to produce refined earthenwares in large quantities after the Civil War. Refined earthenwares were used for a wide variety of tablewares and teawares, including plates, platters, cups, bowls, teapots, teacups, saucers, tureens, and pitchers. The refined earthenwares in the assemblage were separated into thin-bodied whitewares, thick-bodied ironstone/white granite, yellow ware and other refined earthenwares. Ironstone/White Granite was a thicker, more durable clay body first introduced to the market around 1840 (Samford and Miller 2015). White Granite was used for tablewares, including plates, platters, bowls, cups, and tureens, in the 19th century. By the 20th century, White Granite was largely used for restaurant china and toilet wares for use in bathroom fixtures and accessories (Samford 2002). Yellow ware, which was originally imported from the UK, has a softer, yellowish-tinted clay body. Yellow ware production shifted to American after the Civil War. Yellowwares frequently have molded decorations and may have colored glazes or be decorated with bands of colored clay slips.

Porcellaneous wares are high-fired, thin-bodied bright white ceramics. Porcellaneous wares are made from refined clays with high kaolin contents. These clays are fired to temperature high enough for vitrification to occur, causing the clay to take on a glass-like texture. The porcellaneous ware designation is used for ceramics made in the UK and continental Europe beginning in the 18th century and imported to the United States. American producers began making porcellaneous wares for the market in the late 19th century. Porcellaneous wares, which became increasingly common in the early 20th century into the mid-20th century, were used for tablewares, teawares, and decorated objects like vases. Many of these vessels were produced via a slip casting process in which thin kaolin clay was poured into molds.

Coarse earthenwares are produced with less-refined clays and consist of thicker wares fired to lower temperatures. Clays may have inclusions of sand, grit, or other particles, and they may or may not be glazed. Unglazed coarse earthenwares are porous and will absorb water into the clay body. The clay bodies are softer and less compact than refined earthenware and may occur in a variety of colors, including red wares, terracotta, yellowwares, buff-colored pastes, and gray wares. Coarse earthenwares are thicker and were used primarily for

utilitarian vessels in the 19th and 20th centuries. These thicker, more durable ceramics were used for vessels such as storage jars, mixing bowls, crocks, flower pots, pitchers, spittoons, and jugs.

Stonewares are made from compact clays that are fired to a very high temperature. These clay bodies are hard and compact. They are typically buff to grayish in color. Stonewares were primarily imported to America from the UK and Europe until the early 19th century. In the early 19th century, stonewares were being produced and distributed regionally by small potteries. By the mid-19th century, localized production continued, and large centers of stoneware production were established in Ohio, Pennsylvania, New York, and New Jersey (Greer 1981). Potteries took advantage of locally available glacial clays, which they used to produce high-quality stonewares and coarse earthenwares. Stoneware vessels occur in utilitarian forms like jugs, crocks, churns, and mixing bowls. They are typically fired a second time with a chemical glaze that produces a glassy exterior to prevent the fired vessel from absorbing water. The type of glaze can be used to determine a production date for stonewares.

Like the Trench A ceramics, the Trench B, C, and D ceramics consists largely of vessels and other artifacts used in the day-to-day functioning of a household. Whitewares were the most common category of ceramics from Trenches A – D, making up 43% of the assemblage. The next most common ware type in the Trench A – D ceramics were porcelaneous ware at 17% of the assemblage, followed closely by ironstone at 16.5% of the assemblage. Coarse earthenwares were uncommon and consisted primarily of terra cotta and buff-colored ceramics and pieces of thick clay pipe. Only one redware sherd was recovered, which was also a piece of clay pipe.

Utilitarian ceramics in the Trench A – D assemblage consist of stonewares, yellowwares, redwares, and unidentified coarse earthenwares. Utilitarian wares made up roughly 20% of the Trench B, C, and D ceramics. Yellowware from Trenches A-D include brown-glazed Rockingham pottery, which was produced in the U.S. from the 1840s through the 1930s (Claney 2004), and green-glazed yellowware produced between 1900 and 1940.

Stonewares made up 13% of the ceramics from Trenches A – D. Stonewares can be dated by the type of glaze added during a second firing to render the clays impermeable. The earliest American stonewares had salt added to the kiln during firing, which led to a textured surface resembling orange peels. Large-scale production of stonewares in North America was centered in areas where glacial clays were accessible. American potters primarily used two types of slips, Albany slip, originally made from clays in New York, and Bristol slip, originally developed in England but later made from glacial clays. Albany slip can range in color from dark, almost black browns to a tobacco color. Bristol slips are primarily gray, but can range from creamy to a bluish white. The use of these slips changed over time. Full Albany slips date to the mid- to late-19th century. Bristol exteriors with Albany interiors date to from the late 19th to the first two decades of the 20th century. Solely Bristol slip dates exclusively to the 20th century, mostly after 1920 (Greer 1981). Slips in varying shades of blue and pure white became popular in the early 20th century and occurred with Bristol slips on one surface or on the interiors of vessels with unglazed exteriors. Table 3.5 shows the counts of stonewares from Trench A-D by glazes and the dates for those sherds. Nearly 63% of the stoneware sherds are all Bristol slip, followed by 19% Bristol exterior/Albany interior slip, and

Table 3.5. Slips on Stonewares Recovered from Trenches A - D at Oaklawn Cemetery.

Stoneware Glazes	Date	Trench A		Trench B		Trench C		Trench D		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Albany Slip	mid to late 19th c.	9	22.0	0	0.0	1	9.1	0	0.0	11	13.9
Bristol slip ext/Albany slip int	late 19th to early 20th c.	5	12.2	0	0.0	9	81.8	1	4.0	15	19.0
Bristol slip	20th c.	24	58.5	0	0.0	1	9.1	24	96.0	49	62.0
Unglazed ext/light blue int	early - mid-20th c.	1	2.4	0	0.0	0	0.0	0	0.0	1	1.3
Tan glaze (possibly salt)	unknown	1	2.4	1	100.0	0	0.0	0	0.0	2	2.5
Unglazed	unknown	1	2.4	0	0.0	0	0.0	0	0.0	1	1.3
Totals		**41**	**51.9**	**1**	**1.3**	**11**	**13.9**	**25**	**100.0**	**79**	**100**

14% all Albany slip.

Decorated ceramics. Table 3.6 shows the types of decoration on refined earthenwares and porcellaneous wares in the Trench A – D ceramic assemblages. The 43 decorated refined earthenware sherds (Figure 3.3) represent of 37% of the ceramics from Trench B & C. The 52 decorated refined earthenware sherds from Trench D (Figure 3.4) make up 33% of the total Trench D ceramics. The Trench A assemblage had a 36% decorated rate, but a greater variety of decorative techniques.

The most common decorative type from both seasons are molded ceramics. Otherwise undecorated molded

Table 3.6. Decorated ceramic types recovered from Trenches A - D at Oaklawn Cemetery.

Decorative Type	Date	Peak Popularity	Trench A		Trench B		Trench C		Trench D		Total	
			Count	%	Count	%	Count	%	Count	%	Count	%
Molded	1660+	1870-1950	47	36.2	0	0.0	13	0.0	37	72.5	101	45.1
Flow blue transfer-printed	1841+	1890-1904	40	30.8	1	6.7	0	0.0	4	7.8	45	20.1
Transfer-printed	1783+	1820-1870	8	6.2	0	0.0	1	0.0	2	3.9	12	5.4
Spongeware/Spatteware	1820+	1840-1880	4	3.1	0	0.0	0	0.0	1	2.0	5	2.2
Hand-painted	1775+	1820-1920	2	1.5	1	6.7	5	18.5	2	3.9	11	4.9
Gilded	1760+	1900-1950	1	0.8	0	0.0	0	0.0	0	0.0	1	0.4
Multi-color overglaze decal	1875+	1900-1950	28	21.5	13	86.7	1	3.7	1	2.0	44	19.6
Colored, Fiesta Style Glaze	1926+	1936-1970	0	0.0	0	0.0	7	0.0	4	7.8	5	2.2
Totals			**130**	**58.0**	**15**	**6.7**	**27**	**12.1**	**51**	**22.8**	**224**	**100**

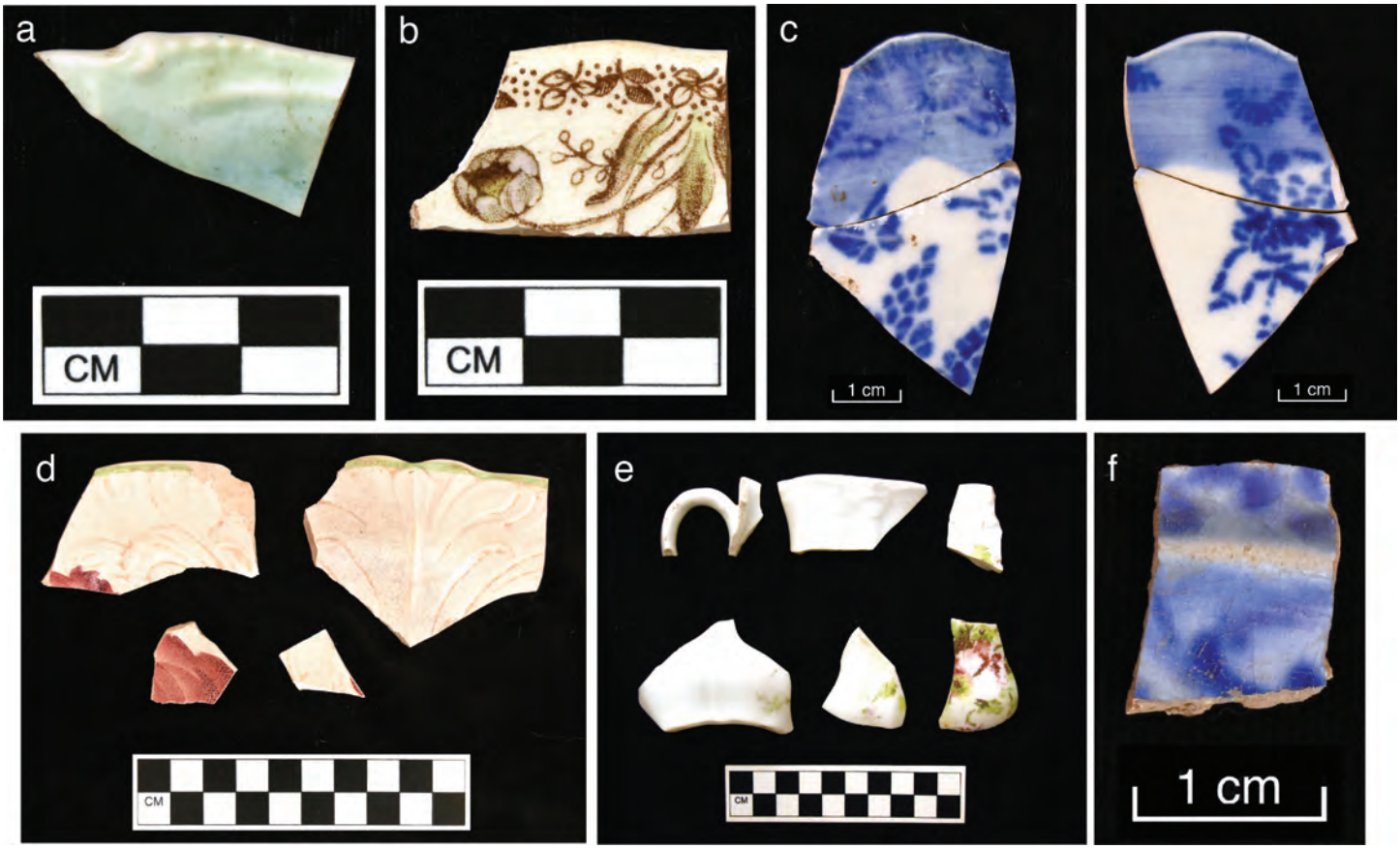


Figure 3.3*. Selected decorated ceramics from the Trench B & C excavations: Trench B: (a) molded aqua decal-decorated porcelaneous ware plate rim (394.002), (b) brown transfer-printed whiteware plate rim with green clobbering in the decoration (395.001), (c) hand-painted Canton porcelain scalloped bowl rim (407.002), (d) molded and hand-painted whiteware plate rim and body (433.001); Trench C: (e) molded overglaze decal decorated porcelaneous ware teapot (618.001), and (f) blue transfer-printed whiteware (621.001).*

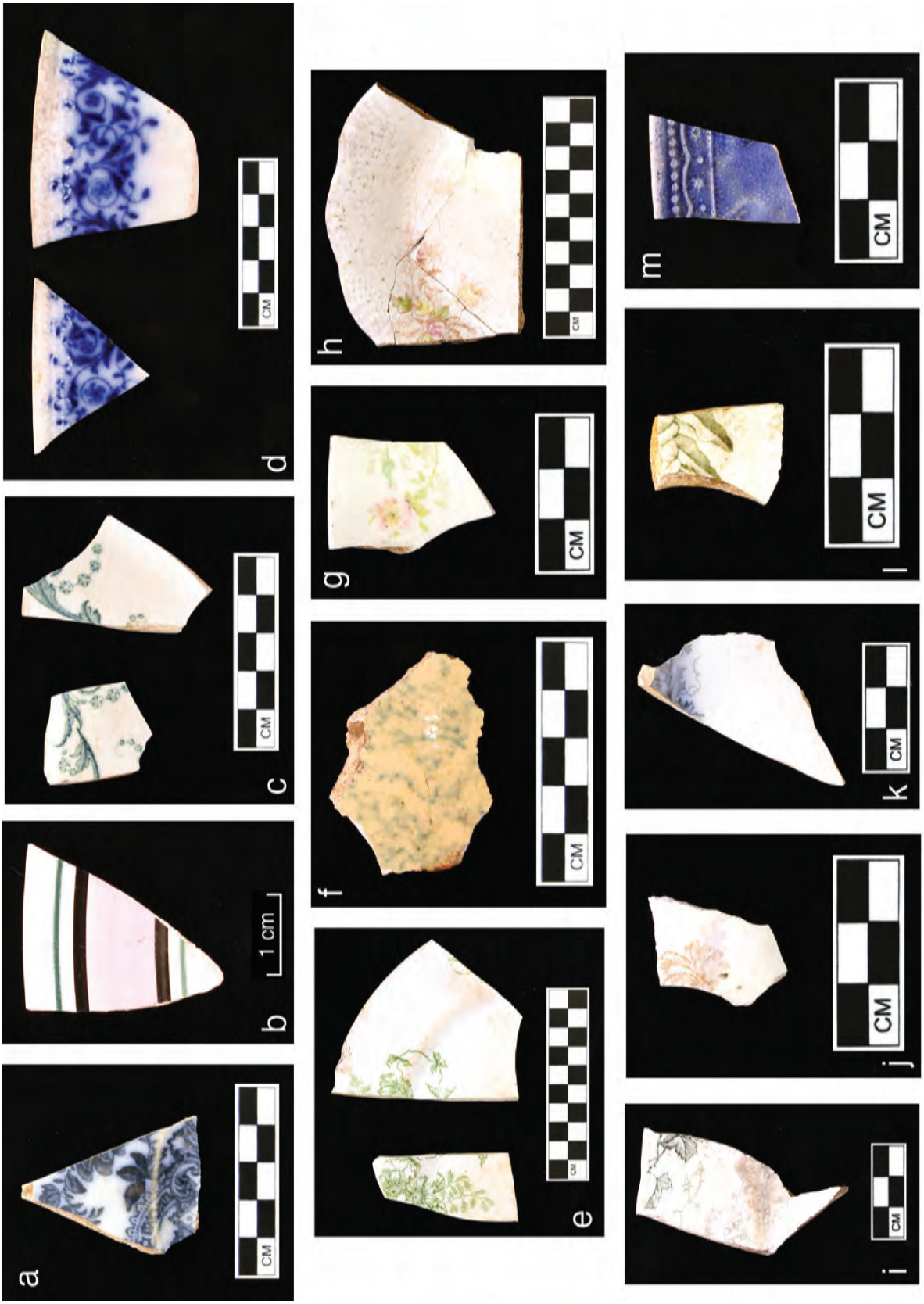


Figure 3.4. *Selected decorated ceramics from the Trench D excavations: (a) dark blue transfer-printed whiteware plate rim (921.002), (b) hand-painted pink, black, and green annular whiteware plate rim (921.002), (c) teal transfer-printed whiteware (921.003 and 923.006), (d) flow blue transfer-printed and molded whiteware teacup rim (921.004 and 922.001), (e) green aesthetic transfer-printed ironstone plate rim (921.005), (f) cream-glazed blue sponge decorated refined earthenware (921.006), (g) faded decal-decorated whiteware teacup rim (921.007), (h) molded and faded decal-decorated bowl (921.008), (i) dark blue transfer-printed whiteware rim (922.002), (j) brown transfer-printed whiteware (922.009), (k) flow blue transfer-printed whiteware in the Mentone pattern (924.001), (l) green transfer-printed whiteware (1090.002), (m) flow blue transfer-printed and molded teacup rim (1090.002).*

ceramics are usually ironstones from the late 19th century or thin-bodied porcellaneous wares and whitewares from the early to mid-20th century. Molded ironstones were introduced in 1840 and made until the close of the 19th century. These molded wares can be roughly dated by the molding motif. For example, the reconstructed ribbed chamber pot (921.016 and 1066.001) recovered from Trench D shown in Figure 3.5, dates to the last half of the 19th century. Molded whiteware plates with decorations around the rims became popular in the early 20th century. Frequently these plates had overglaze decals that may have been rubbed off or are confined to the center of the plate. Import of molded porcellaneous wares made in continental Europe exploded in the late 19th century. Many of these vessels were made in Germany. The blank vessels were produced and then purchased by tradesmen who decorated the vessels, typically via hand-painting and gilding, and sold the finished pieces. They include a wide variety of tablewares and decorative forms.

***Figure 3.5**. Mended portion of a molded ironstone chamber pot from the late 19th century from Trench D (921.016 and 1066.001).*

Transfer-printed sherds in a variety of colors were the next most common decorative type. Transfer-printed ceramics were made by transferring an inked image from an engraved copper plate to the vessel surface. Transfer-printed sherds were first made in the late 18th century in Staffordshire, England, which has been the center of ceramic production in the UK since that time. The earliest transfer-printed designs were inspired by Chinese ceramics and depicted scenes from Chinese legends. Transfer wares reached their greatest popularity in the mid-19th century, when decorative motifs depicted events in British and American history, pastoral scenes, gothic castles, classical motifs with ancient ruins, and floral designs.

Transferware sherds can be dated by color, motif, and style. The Trench A-D assemblage includes

transferware ceramics in three colors: brown, green/teal, and shades of blue. Transfer-printed sherds were produced in a variety of colors, including red, brown, purple, green, brown, and, most commonly, blue. The colors were introduced to the market and reached their peak popularities at different documented times. Flow blue is a variety of transfer printing executed by adding excess ink, creating a blurred image. Flow blue sherds were introduced to America as early as 1844 and remained popular into the early 20th century (Samford and Miller 2012). Eighty percent of the transfer-printed sherds are decorated with flow blue designs, including a piece from the 2022 backdirt that refits with sherds from a plate recovered from Trench A. That plate likely dates between 1891 and 1908. A sherd from Trench D matches with the Mentone pattern transfer-printed sherds produced by Alfred Meakin and Company between 1897 and 1907 recovered from Trench A.

The brown and green transfer-printed sherds from Trenches A – D date to different decades in the 19th century. The oldest sherd from Trench C (395.001, see Figure 3.3) is a brown transfer-printed sherd with green clobbering added to the decoration. Clobbering involves adding additional colors to the design after the original transfer is executed. Brown transfer-printed sherds dated between 1818-1869 but were most popular in the 1830s-1840s (Samford 2012). This sherd is likely an heirloom, like the green transfer-printed sherd (343.002) recovered from Trench A. None of the sherds from Trench D date to the mid-19th century. Most of the green and brown transfer-printed sherds from Trenches A – D date to the aesthetic period of transfer decoration, which began in the 1870s. These late Victorian designs are characterized by asymmetrical motifs, typically with Asian influences (Samford and Miller 2012). Two green aesthetic transferware sherds recovered from Trench D (921.005, see Figure 3.4) are from the same plate recovered from Trench A (383.001). The other brown and green transfer-printed sherds from Trench D are small and cannot confidently be assigned to a stylistic tradition. Brown transfer-printed sherds from a molded bowl with a floral motif recovered from Trench D (921.008, Figure 3.4) have a maker's mark on the base from an American pottery, the East Liverpool Potteries Company. This mark was used, which was based in East Liverpool, Ohio, by the company between 1901 and 1907.

Ceramics decorated with multi-colored overglaze decals made up 20% of the decorated refined earthenwares. The use of multi-colored decal decoration began in the 19th century and reached its height of popularity in the early 20th century (Samford and Miller 2012). The decals typically have brightly-colored floral motifs, with pink, red, orange, and yellow flowers and green leaves. Because the decals were applied over the glaze, they were often damaged by use, repeated washing, or by being buried in the ground as part of the archaeological record. The faded decal-decorated ceramics from Trench B are primarily from a single molded porcelaneous ware teapot with a pink, red, and green rose motif (618.001, see Figure 3.3). Two decal-decorated ceramic were recovered from Trench D, a faded teacup rim with a pink floral motif (921.007, see Figure 3.4) and a molded bowl with a floral motif (921.008).

Three additional decorative methods make up the remaining 10% of the decorated refined earthenwares. The most common of these were hand-painted ceramics. Hand-painted ceramics have a wide date range. The molded green and red hand-painted edgeware from Trench C (433.001 and 465.001, see Figure 3.3) has motifs that resemble 19th century hand-painted ceramics from Staffordshire. Upon closer inspection, the vessel form and ware type indicate that these sherds are from the 20th century. The other hand-painted ceramics from Trench B were blue hand-painted Canton ware sherds (407.002, see Figure 3.3). These sherds were made in China and date to the late 19th/early 20th century. The only hand-painted sherd from Trench D is an early to mid-20th century plate rim with a pink and black banded motif (921.002, Figure 3.4). A single piece of sponge-decorated refined earthenware was recovered from Trench D (921.006, see Figure 3.4). It may be part of a pottery crock and likely dates to the early 20th century. Five 20th century colored Fiesta-style glazed refined earthenware sherds from Trench D date to the early to mid-20th century (923.001, see Figure 3.4).

Maker's marks are frequently found on the bases of refined earthenwares and porcellaneous wares. Because ceramic makes frequently changed their marks as they changed their decorations, maker's marks can narrow date ranges for ceramics. Figure 3.6 shows sherds from Trenches B – D with maker's marks. One sherd from the base

of a plate with a Homer Laughlin maker's mark dating after 1911 (407.001) was recovered from Trench C. Six maker's marks were identified in the Trench D assemblage. This includes the East Liverpool mark described above and marks from three additional companies. One, a mark that reads "FRANCE" (923.004) cannot be dated. Three sherds have marks that read "VERSAILLES" (921.011, 921.012, and 923.003). One (921.012) also has "BAVARIA" printed on the base. These marks were used by Rosenthal & Company, a Bavarian company that decorated premade vessels, between 1891 and 1906. A sherd from an ironstone vessel base has the globe mark of the Burford Brothers pottery of East Liverpool, Ohio, which was used between 1881 and 1904 (924.002).

Cross-mended sherds. Multiple ceramics mend across Trenches A - D (Figure 3.7). Two pieces of Rockingham decorated yellow ware from the 2022 excavations were from the same vessel or vessel set as sherds 61.004, 102.002, & 331.00 from the Trench A excavations. Sherds from the rim and body of a Bristol/Albany glazed stoneware jug from Trench B cross-mend to sherds 61.001 & 331.010 from the Trench A. This jug has the same date range as the Rockingham vessel. A portion of an ironstone lid (387.001) from the 2022 excavations, from either a tureen or a chamber pot, refits with a lid (18.008) from the Trench A. This sherd was recovered from excavation a backfilled portion of BH 3, which means it may have been missed during the Trench A excavations.

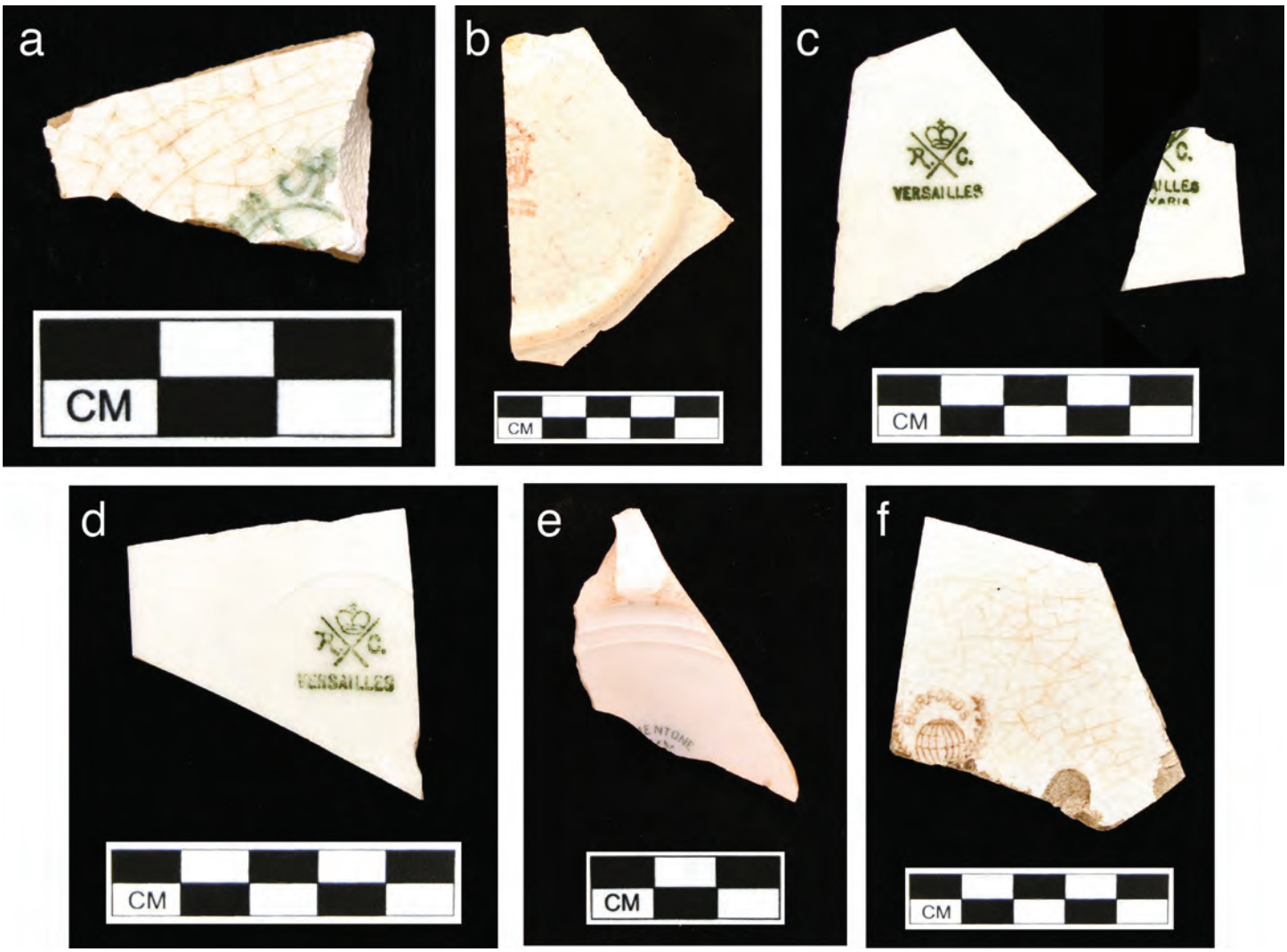


***Figure 3.6**. Selected maker's marks from Trench C & D: Trench C: (a) whiteware plate with a post-1911 Homer Laughlin China Company mark (407.001); Trench D (b) molded whiteware bowl with East Liverpool Potteries mark, 1901-1907, (c) porcellaneous ware with Rosenthal & Company, Bavaria "Versailles" pottery marks, 1891-1906 (921.011 and 921.012), (d) Rosenthal & Company, Bavaria "Versailles" pottery marks, 1891-1906 (923.003), (e) transfer-printed whiteware Mentone mark from the Alfread Meakin pottery company, after 1897 (924.001), (f) ironstone with Burford Brothers Pottery mark, 1881-1904.*

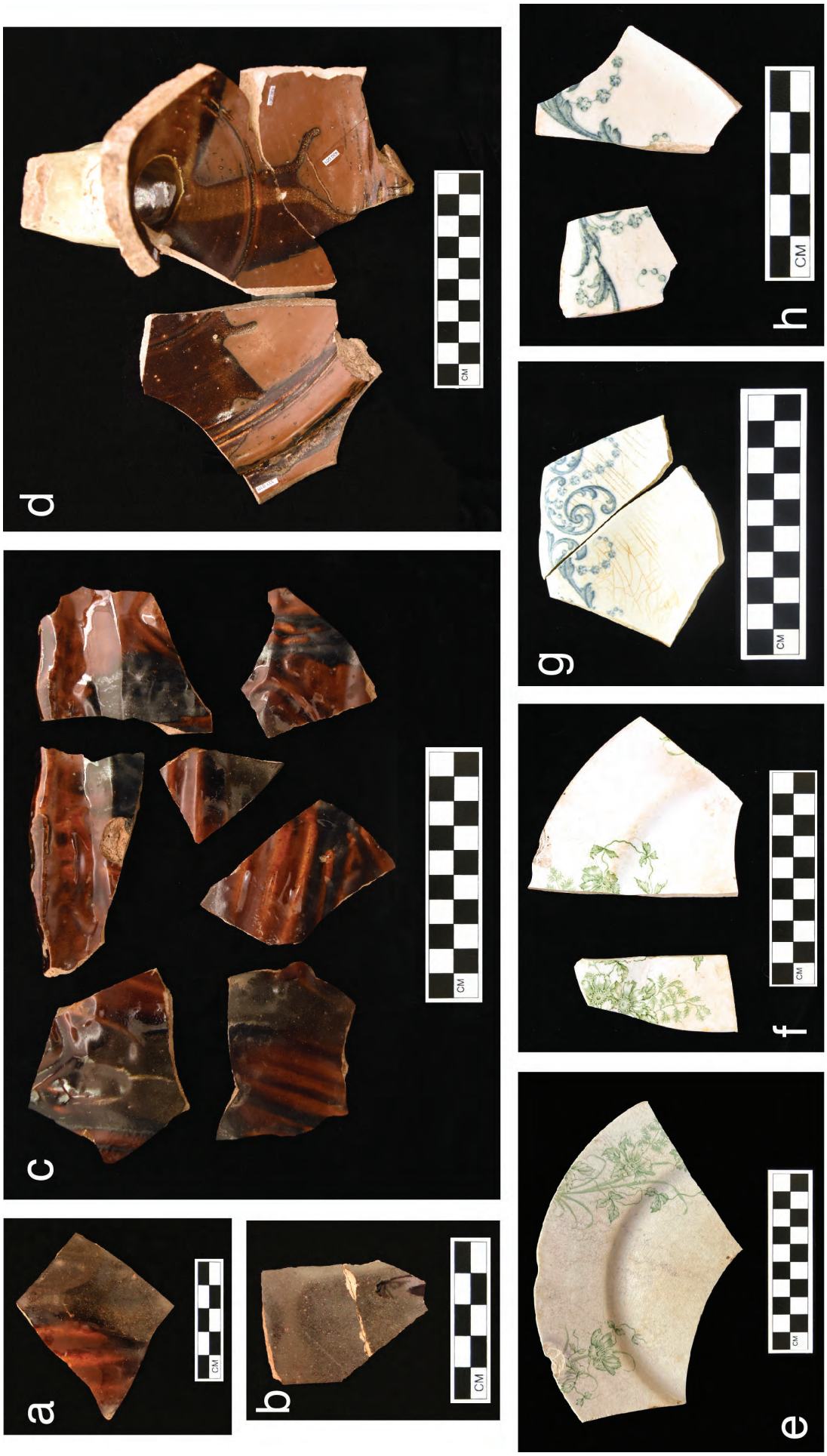


Figure 3.7. *Cross-mends across trenches from the Trench A – D excavations: (a,b) Single Rockingham glazed sherds from the Trench A re-excavations and Trench C excavations (385.001 & 393.002), (c) Rockingham sherds from the same vessel or vessel type from Trench A (61.004), (d) Sherds from the top of and Albany/Bristol slip jug from Trenches A & C (lower right) (61.001, 331.001, and 430.001), (e) green aesthetic transferware from Trench A (383.001) and (f) Trench D (921.005), (g) Teal transfer-printed rim from Trench A (331.005 and 343.001) and (h) Trench D (921.003 and 923.006).*

The green aesthetic transfer-printed plate sherds (921.005) from Trench D match with a sherd from Trench A (383.001). That plate dates between 1870 and 1900. Two teal transfer-printed sherds (921.003 and 923.006) from Trench D have the same motif as two sherds (331.005 and 343.004) from Trench A. These sherds date from the early 20th century. The flow blue transfer-printed sherd in the Mentone pattern from Trench D mentioned above matches several sherds from Trench A.

Dating the Ceramic Assemblage. The stoneware glazes, decorated ceramics, and makers marks from Trenches A – D indicate that most of the ceramic assemblage from this area of Oaklawn date between 1890 and 1920. Several of the transfer-printed sherds from Trenches A and D were made in the mid-19th century; these are likely heirloom sherds. Because there are fewer decorated tablewares, the Trench B and Trench C assemblages are more difficult to date than the Trench A and Trench D assemblages. More ceramics in the Trench B and C assemblages date later in time, including some of the molded porcelaneous wares, a colored Fiesta-style glazed sherd, and the hand-painted molded plate. Only one ceramic from the Trench D assemblage, a small hand-painted ceramic with pink and black bands, appears to date to the mid-20th century.

The locations of the excavations were a factor in the ceramic recovery. The Trench B and Trench C excavations did not encounter the deep stream deposits where discarded household artifacts were concentrated during the Trench A excavations. Trench D was smaller in size but was excavated into areas of very high artifact density. The artifacts from within and along the edges of the stream bed were deposited before this are of the site became a cemetery. Other ceramics were deposited when the area was used as a cemetery or were present in the fill dirt used to raise the elevation of the ground surface in this area.

Glass

The glass analysis collected data including glass color, broad type, container type and portion, manufacturing and finish method, and embossing. The glass assemblage consisted of 96 pieces of glass from Trench B, 578 from Trench C, and 432 from Trench D. The Trench C assemblage is also larger than the Trench A (n=534). The 674 pieces of glass account for 62 percent of the total Trench C artifacts by quantity but only 38 percent of the assemblage by weight. As discussed above, glass was more likely to be recovered broken during the 2022 field season due to the dry soil conditions during backhoe excavation. The 532 pieces of glass from Trench D weighed more than the combined glass from Trench B & C, making up 55 percent of the Trench D assemblage by weight.

Glass colors. Table 3.7 provides counts of the glass colors present in the Trench A – D assemblages. The term colorless is used in lieu of clear glass to described glass without any color tint. Colorless glass made up 63 percent of the Trench B, 59 percent of the Trench C, and 47 percent of the Trench D assemblage. Only certain glass colors are of chronological value. Colorless glass has some utility in dating bottles. Colorless glass bottles were introduced after 1870 but only became the majority after 1910, when glassmaking shifted to a largely mechanized process (Lindsey 2024). Colorless tablewares were common earlier than colorless bottles. Milk glass, an opaque white glass that makes up just over one percent of the Trench A – D glass, was commonly used in cosmetic jars from the 1890s to the 1920s. Milk glass also was used to produce lid liners for canning jars from the 19th century through at least World War II (Lindsey 2024).

Light amethyst-colored glass, which makes up 11 percent of the Trench B and C and seven percent of the Trench D glass, is the result of the use of manganese as a decolorant in glass recipes. Manganese, which created a slight purplish tint that increased in depth with exposure to sunlight, was used in glass produced between 1875 and 1918 (Lindsey 2024). Fragments of a bottle with a straw-colored tint were recovered from the Trench C excavations. The faint yellow tint is the result of the addition of selenium or arsenic to the glass recipe as a decolorant. Bottles with a faint yellow tint date between 1918 and 1950 (Lindsey 2024).

The glass assemblage includes shades of green glass, including light yellow, olive, emerald, bright green,

Table 3.7. Glass colors recovered from Trenches A - D at Oaklawn Cemetery.

Glass Color	Trench A		Trench B		Trench C		Trench D		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
Amber/Brown/Black Amber	52	9.7	9	9.9	42	7.5	85	20.8	188	11.4
Aqua/Light Aqua	96	18.0	3	3.3	51	9.1	53	13.0	205	12.4
Bright (7-Up Green)	1	0.2	2	2.2	1	0.2	3	0.7	7	0.4
Cobalt Blue	3	0.6	0	0.0	1	0.2	1	0.2	5	0.3
Colorless	276	51.7	57	62.6	332	59.4	192	46.9	907	55.1
Dark Olive/Olive Green/Olive Amber	0	0.0	0	0.0	23	4.1	7	1.7	30	1.8
Deep Blue/Deep Green Aqua	47	8.8	7	7.7	19	3.4	34	8.3	107	6.5
Emerald Green	0	0.0	0	0.0	0	0.0	2	0.5	2	0.1
Manganese (Light Amethyst)	38	7.1	11	12.1	62	11.1	29	7.1	142	8.6
Light Blue	0	0.0	1	1.1	2	0.4	0	0.0	3	0.2
Light Green/Light Yellow Green	6	1.1	0	0.0	2	0.4	0	0.0	8	0.5
Light Yellow (Straw)/Yellow	0	0.0	0	0.0	17	3.0	0	0.0	17	1.0
Jet	0	0.0	1	1.1	0	0.0	0	0.0	1	0.1
Milk Glass	15	2.8	0	0.0	6	1.1	2	0.5	23	1.4
Sapphire blue	**0**	0.0	0	0.0	1	0.2	1	0.2	2	0.1
Total	**534**	**32.4**	**91**	**5.5**	**559**	**33.9**	**409**	**24.8**	**1647**	**100.0**

and dark olive. Only a few shades of green have utility for dating. Bright (7-Up) green glass is very rare prior to 1900; almost all examples of this glass are dated to the 20th century. Two bright green pieces of glass were recovered from Trench B, one from Trench C, and three pieces were recovered from Trench D. The Trench C assemblage includes three pieces of thick dark olive green glass, a color frequently associated with 19th century alcohol bottles that all but disappeared after 1890 (Lindsey 2024). No dark olive glass was recovered from Trenches A, B, and D.

Other glass colors have less utility for establishing a narrow date range. Aqua glass of all shades, which makes up three percent of the Trench B glass, nine percent of Trench C, and 21 percent of the Trench D glass, has a very wide date range. Aqua coloring may be intentional, or it may result from the use of sands with iron content in the glass recipe. Aqua glass was replaced by colorless glass at the start of the 20th century as decoloring agents and glass-making technology improved, but soda bottles and canning jars continued to be primarily aqua until at least the 1930s (Lindsey 2024). Cobalt and sapphire blue glass colors, which make up a low percentage of the Trench A – D glass also have little dating utility.

Amber glass could also result from impurities in the glass sands or from intentional addition of coloring agents (Lindsey 2024). Most of the amber glass in the assemblage was the medium brown color used in modern beer bottles. Lindsey (2024) notes that 19th century amber glass occurred in a variety of shades with tints ranging from reddish to olive to black. Amber colors became more and more standardized as bottle production became increasingly mechanized in the early 20th century. The Trench D glass included examples of olive amber and black amber glass that date to the late 19th century.

Container Types. Table 3.8 provides a breakdown of the number of identifiable containers by type. Containers can be identified from shards of glass using multiple lines of evidence, including the presence of vessel landmarks, including finishes, shoulders, and bases, curvature or other shape of the shards, and presence and content of embossing. Even if they were recovered in multiple pieces, which was frequently the case, the

Table 3.8. Types of Containers Recovered from Trenches A - D at Oaklawn Cemetery.

Broad Type	Container Type	Trench A		Trench B		Trench C		Trench D		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Jars	Canning Jar	28	84.8	1	33.3	4	25.0	3	33.3	37	61.7
	Cosmetic Jar	1	3.0	0	0.0	2	12.5	0	0.0	2	3.3
	Unidentified Jar	2	6.1	2	66.7	7	43.8	5	55.6	10	16.7
	Commercial Food Jar	0	0.0	0	0.0	3	0.0	0	0.0	3	5.0
	Large jar	0	0.0	0	0.0	0	0.0	1	11.1	6	10.0
	Mason Jar Lid Liner	2	6.1	0	0.0	0	0.0	0	0.0	2	3.3
	Total	33	16.7	3	18.8	16	18.4	9	9.8	60	15.6
Bottles	Condiment Bottle	11	7.6	0	0.0	0	0.0	9	11.7	21	7.4
	Liquor Bottle	12	8.3	0	0.0	4	6.6	4	5.2	21	7.4
	Wine bottle	0	0.0	0	0.0	1	1.6	0	0.0	1	0.4
	Soda/Beer Bottle	13	9.0	2	20.0	6	9.8	10	13.0	31	10.9
	Milk bottle	1	0.7	1	10.0	0	0.0	0	0.0	2	0.7
	Medicine/Extract Bottle	15	10.4	3	30.0	11	18.0	23	29.9	51	17.9
	Poison Bottle	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4
	Glue Bottle	1	0.7	0	0.0	0	0.0	0	0.0	1	0.4
	Ink/Polish Bottle	1	0.7	0	0.0	0	0.0	1	1.3	2	0.7
	Oil bottle	0	0.0	0	0.0	1	0.0	0	0.0	1	0.5
	Perfume/Toiletry bottle	0	0.0	0	0.0	0	0.0	2	2.6	3	1.1
	Stopper	3	2.1	0	0.0	0	0.0	1	1.3	4	1.4
	Unidentified bottle	87	60.4	4	40.0	38	62.3	27	35.1	146	51.2
	Total	144	72.7	10	62.5	61	70.1	77	83.7	285	74.0
Tablewares	Compote	1	4.8	0	0.0	0	0.0	0	0.0	2	0.5
	Goblet	1	4.8	0	0.0	0	0.0	0	0.0	1	0.5
	Vase	2	9.5	0	0.0	1	10.0	1	16.7	4	1.0
	Tumbler/Snuff jar	10	47.6	1	33.3	2	20.0	4	66.7	18	4.7
	Unidentified Tableware	7	33.3	2	66.7	7	70.0	1	16.7	15	3.9
	Total	21	10.6	3	18.8	10	11.5	6	6.5	40	10.4
Total for Identified Containers		**198**	**51.4**	**16**	**16.8**	**87**	**94.6**	**92**	**23.9**	**385**	**100**

containers in Table 3.8 were counted individually. A single canning jar broken into 14 different pieces was counted as one jar. The containers are divided into three broad categories, jars, bottles, and tableware. Bottles were the most common container, representing 74 percent of the total Trench A – D containers.

Canning jars are very common on archaeological sites from the late 19th/mid-20th century and reflect the popularity of long-term preservation of seasonal foods within the household. Eighty-five of the jars in Trench A were canning jars. Canning jars were less common in Trenches B, C, & D, making up only a third or less of the jars. One of the Trench C milk glass cosmetic jar fragments (432.001) was marked with a portion of the company name "Marinello," which produced this style jar between 1903 and 1931 (Figure 3.8). Several fragments of large storage or battery jars were recovered from Trench B, C, & D assemblages but not from Trench A jars. The purpose of most of the Trench B, C, and D jars was not identifiable.

Fragments from three food jars were recovered from Trench C (Figure 3.9). One (413.004) was produced by John Morrell & Company, originally a meatpacking company based out of Ottumway, Iowa. The company later expanded to produce jarred vegetables, peanut butter, coffee, and dog food. The jar is marked 1903, which gives the earliest possible date of production. Two of the additional jars (409.003 and 618.002) were marked with patent dates in 1903 and 1906 embossed on the interior of the bases. Those dates indicate that the jars were a type of vacuum sealed glass container produced by the Beech Nut Corporation. When sold, these jars contained meat products (lard, dried beef, and bacon), peanut butter, jelly, soup or strained and chipped foods. This type of jar was often used as a drinking glass once the product inside was used. A single manganese glass condiment jar (1070.002) was identified from Trench D (Figure 3.10). This jar is embossed "PATENTED JULY 23, 1901." It has no suction marks on the base meaning it was made on a fully automatic machine, which were not used until after 1910. The manufacture method and glass color establishes a 1910-1918 date range.

Figure 3.8. *Fragment of a milk glass cosmetic jar made by the Marinello company recovered from Trench C (432.001).*

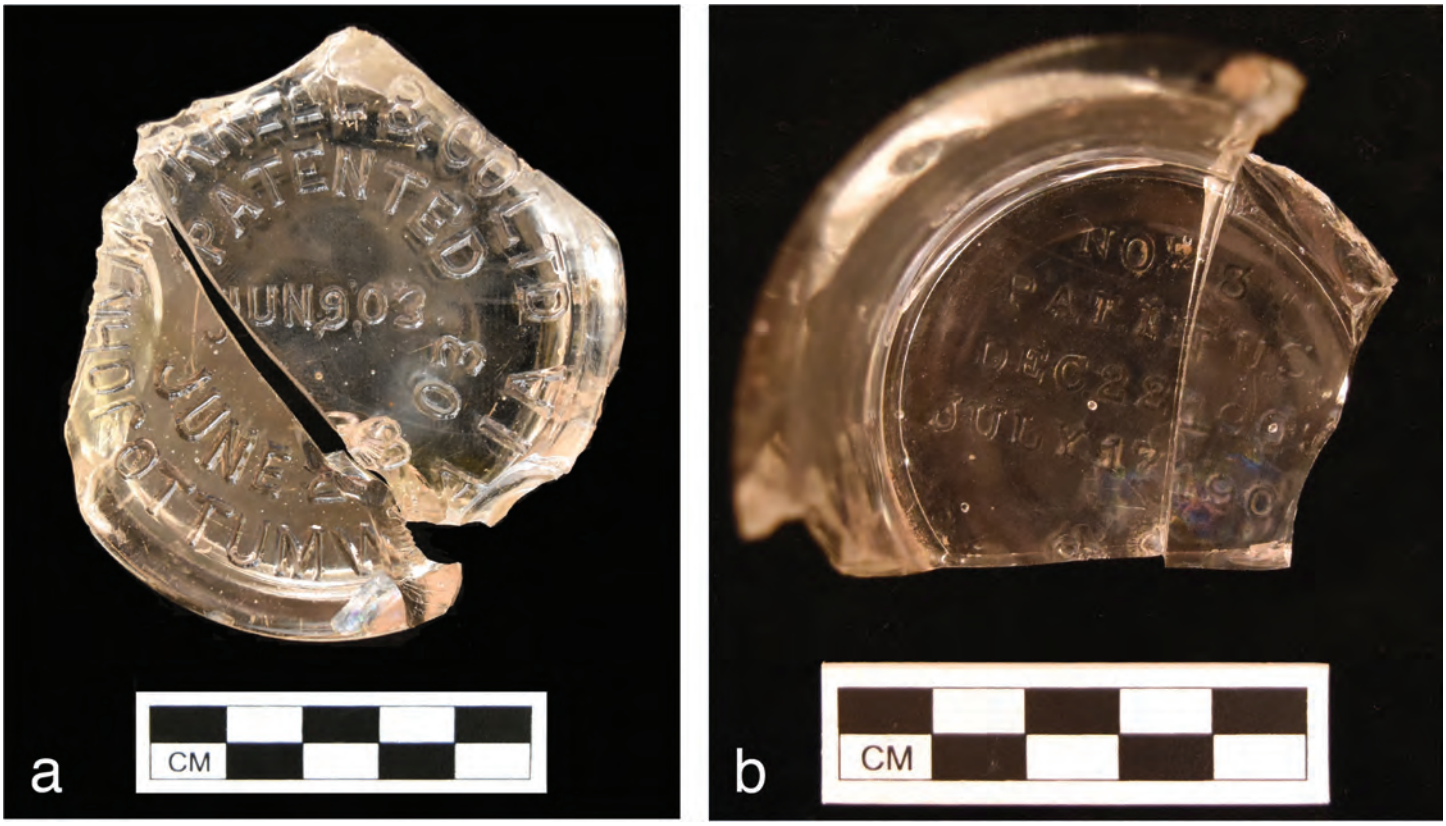


Figure 3.9. *Glass food jars from the 2022 excavation: (a) Colorless glass base of a food jar from John Morell & Company (413.004, Trench C), (b) Colorless glass base of a vacuum sealed food jar produced by the Beech Nut Packing company (618.002, Trench B).*

***Figure 3.10**. Manganese glass condiment jar base (1070.002) with 1901 patent date from Trench D.*

Bottle production. For most of the history of bottle production, going back at least as far as ancient Rome, glass bottles were free blown. Glass blowers took a blob of hot glass from a furnace onto the end of a blow pipe and blew, creating a hollow bubble of glass that they could shape into a container using tongs. Beginning in the 19th century, as demand for glass containers grew, glass blowers increased their production speed by blowing bottles into molds. The use of molds also resulted in a more consistent product that could be embossed with product names and maker's marks. The various types of bottle and container molds left identifiable marks on the body and base of the finished bottle.

Technological innovations, including method of production, method of finish application, text embossing, and maker's marks were used by bottle makers over well-documented periods in the 19th and 20th century. These techniques were developed and reached peak popularity before falling out of use as they were supplanted by newer innovations. Archaeologists can use the marks left by various molds and other production techniques to reliably date bottles.

Table 3.9 provides the counts and dates for bottles and jars with identifiable manufacture methods. Slightly more than half of the identified containers were blown into various types of molds. Trench D had the highest percentage, with nearly ¾ of the containers being mold-blown. Only a little over a quarter of the containers from Trench B were blown into molds. Cup-bottom molds, which achieved peak popularity between 1880 and 1920, were the most common type of mold in the Trench A – D assemblage. Cup-bottom molds were frequently used for small pharmacy bottles well into the 20th century when machines were taking over glass container production (Lindsey 2024). Post-bottom molds, which were first made in the 1850s, produced thicker containers. They were commonly used for soda bottles and canning jars as late as 1905 (Lindsey 2024).

Table 3.9. Manufacture method of jars and bottles recovered from Trenches A - D at Oaklawn Cemetery.

Manufacture Method	Date Range	Trench A		Trench B		Trench C		Trench D		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Post-Bottom Mold	1840-1905	10	18.9	0	0.0	1	15.9	3	7.7	14	11.4
Cup-Base Mold	1880-1920	23	43.4	2	28.6	9	36.5	26	66.7	60	48.8
Plate Mold	1840-1920	2	0.0	0	0.0	0	0.0	0	0.0	2	1.6
Turn Mold	1880-1915	1	1.9	0	0.0	1	1.6	2	5.1	4	3.3
Owens Machine	1905-1930	3	5.7	1	14.3	3	4.8	3	7.7	10	8.1
Press-and-Blow Machine	1905-1930	8	15.1	0	0.0	0	12.7	3	7.7	11	8.9
Machine Made	1908+	16	30.2	4	57.1	11	25.4	5	12.8	36	29.3
Total		**53**	**43.1**	**7**	**5.7**	**24**	**19.5**	**39**	**31.7**	**123**	**100**

At the start of the 20th century, inventors began developing machines that turned glass container production into an automated, machine-driven process. Semi-automated machines like the Owens Automatic Bottle Machine and press-and-blow machines were introduced in the early 20th century. This mode of production dominated the bottle market through the 1920s (Lindsey 2024). Initially these machines were used only to produce wide-mouth vessels, particularly jars. Fully automated machines capable of producing bottle necks and finishes were introduced in 1908 but did not fully replace the semi-automated machines until after World War I. Only about a quarter of the Trench A, C, and D containers were made on any type of machine, while over 58 percent of the Trench C bottles were machine-made.

As mold production technology changed, glass producers also developed new ways of adding a finish, the technical term for the lip of a bottle, at the end of production. The finishes on mold-blown glass bottles were formed after the hot glass left the mold by either (a) applying additional glass to form the lip or (b) using a special tool to shape the hot glass into the finish (Lindsey 2024). These types of finishes are referred to as applied and tooled, respectively. The automated machines included the finish in the manufacturing process. Applied finishes, which were the exclusive finish type used during much of the 19th century, began to drop off in use by 1875. No applied finishes were recovered during the Trench A – D excavations. Tooled finishes were first used around 1870 and became the dominant finish type by the 1880s. Tooled finishes were produced until the 1930s but dropped off significantly in use with the rise of the various machine-making process after 1910. Table 3.10 shows the quantities for finish methods in the Trench A – D assemblage. No applied finishes were observed. Tooled finishes were more common, with a roughly 2-to-1 ratio of tooled to machine-made finishes. This suggests the glass containers span the transition from mouth-blown to machine made bottles, which occurred during the first decades of the 20th century.

Finish styles, which differed based on the purpose of the container and the type of closure, were recorded when they were identified. For the most part, finish style has less temporal utility but can provide clues as to the purpose of the container.

Table 3.10. Finish methods of bottles recovered from Trenches A - D at Oaklawn Cemetery.

Finish Method	Date Range	Trench A		Trench B		Trench C		Trench D		Total	
		Count	%	Count	%	Count	%	Count	%	Count	Percent
Tooled	1870-1930	13	69.2	4	69.2	6	69.2	14	73.7	37	58.7
Machine Made	1910+	5	30.8	2	30.8	5	30.8	5	26.3	16	41.3
Total		39	52.7	6	8.1	11	14.9	19	25.7	74	100

Bottle types. The glass bottles were subdivided into 13 categories by use. The bottle groups were subdivisions of the broader categories of food, beverage, medicine, toiletry, and household bottles. Roughly 56 percent of the bottles (n=158) from Trench A – D were unidentified. Trench D had 49 identified bottles and the highest bottle identification rate at roughly two-thirds of bottles identified. Trench B had a similar rate of identification with 60 percent of bottles (n=6) identified. Nearly 40 percent of the bottles from Trench A (n=54) and Trench D (n=23) were identified.

Beverage bottles containing liquor, wine, beer, soda, and milk (n=55) were the most common category in the Trench A – D assemblage. Soda and beer bottles made up the largest portion of the Trench B and Trench C bottles. A few can be identified by brand (Figure 3.11). A small shard of an embossed medium amber glass bottle (385.003) was identified as a portion of an Old Joe Gideon whiskey bottle. Old Joe Gideon was based out of Louisville, Kentucky and operated from 1902 to 1920, when Prohibition forced the company to stop production (Sullivan 2020). This bottle was from the re-excavations of Trench A, so is not assigned a provenience. The base of a medium amber beer bottle (394.007) from Trench C has embossed text stating that the bottle contained

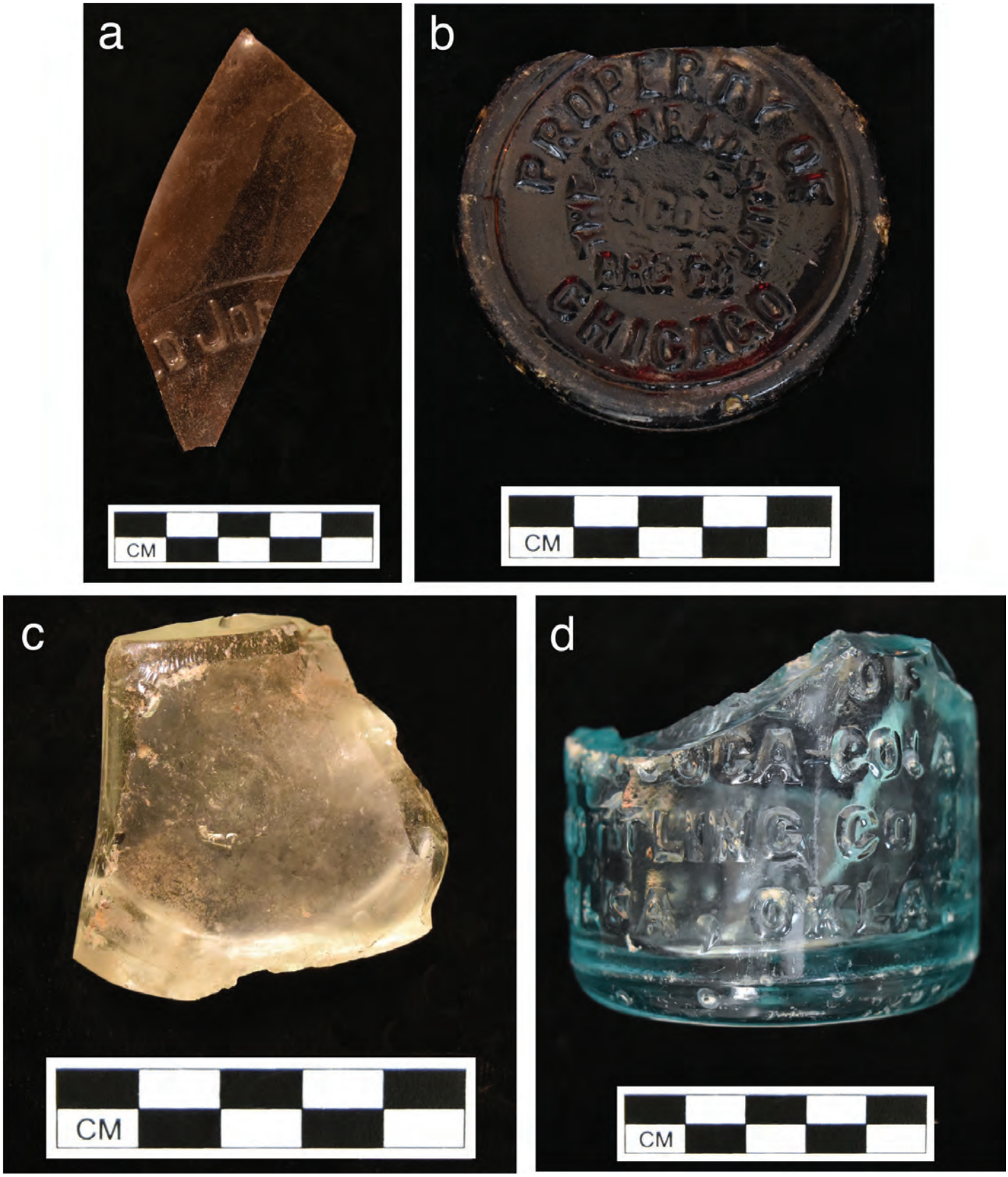


Figure 3.11. *Glass food jars from the 2022 excavation: (a) Colorless glass base of a food jar from John Morell & Company (413.004, Trench C), (b) Colorless glass base of a vacuum sealed food jar produced by the Beech Nut Packing company (618.002, Trench B).*

beer from the Conrad Seipp Brewing Company, which was based out of Chicago. The company was founded in 1872 and produced beer until 1919, and was also felled by Prohibition (Chicagology 2024). Two fragments of Coca Cola bottles were recovered. One of these bottles (597.001), from Trench C, is marked TULSA, OKLA., indicating this bottle was made after Oklahoma achieved statehood in 1907. It is a straight-sided bottle, meaning it dates before 1915, when the Coca Cola Company mandated that all producers move to "hobble skirt" shaped that became an iconic emblem of the product in the 20th century (The Coca-Cola Bottling Company 2024).

The Trench D beverage bottles (Figure 3.12) held liquor, soda, and beer. Several have identified makers. One of the aqua soda bottles (923.007) has a base mark from the Interstate Glass Co of Kansas City (Lockhart et al. 2016b). The plant was open for a very short window, only producing bottles from 1902-1903. An amber beer bottle (923.008) from the same context has a mark from the North Baltimore Bottle Glass Company that was used between 1887 and 1920 (Lockhart et al. 2018a). The bottle was made with an older bottle making technology, a post-bottom mold, suggesting it dates to the earlier end of that time range. Numerous soda and beer bottles made

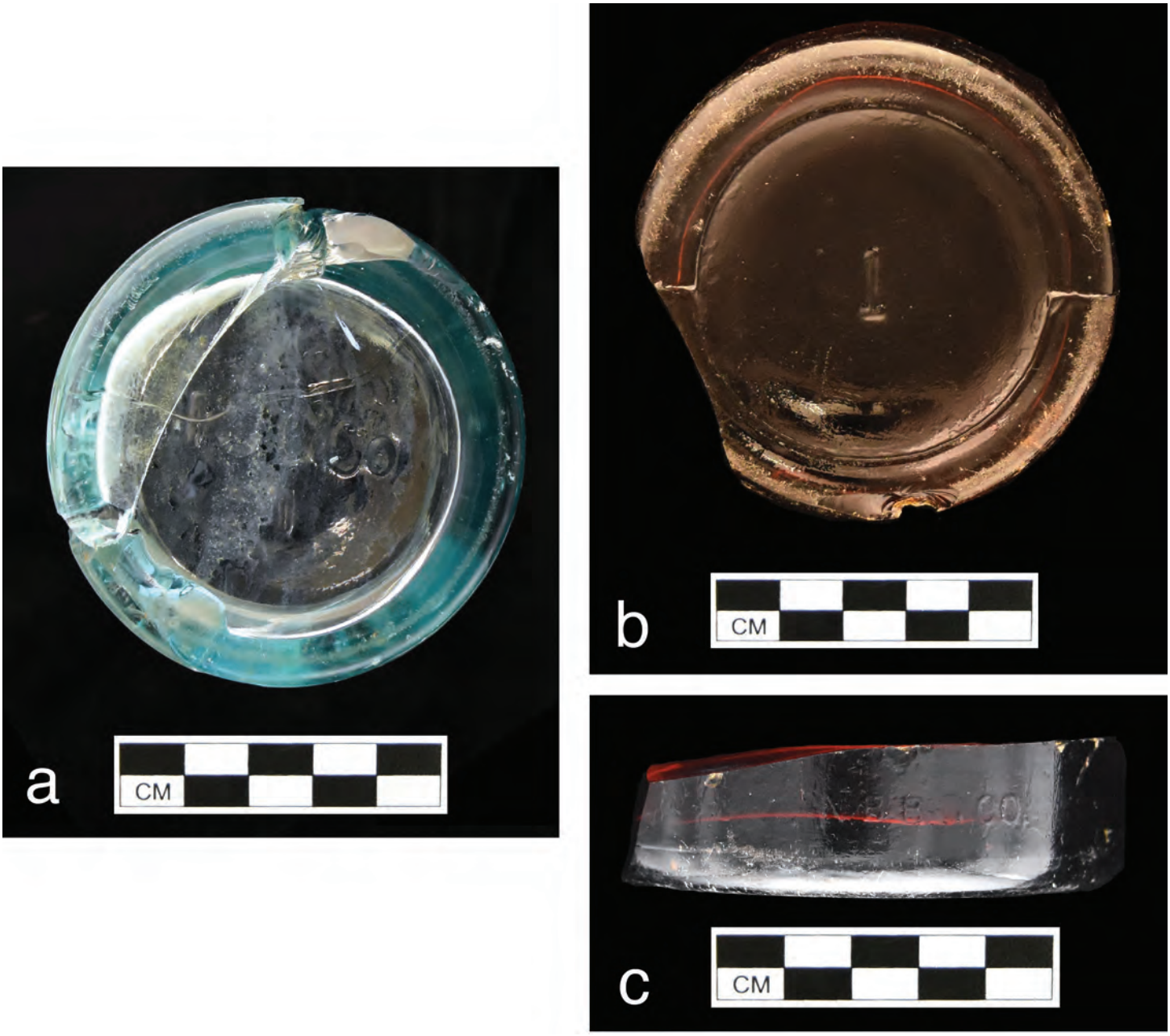


Figure 3.12. *Soda and beer bottles from Trench D: (a) aqua soda bottle with base mark from the Interstate Glass Co of Kansas City, 1902-1903 (923.007), (b,c) post-bottom mold made reddish amber beer bottle with North Baltimore Bottle Glass Company heel mark, 1887-1920 (923.008).*

by the American Bottle Company of Belleville, Illinois with an interlocking "AB" mark were recovered from Trench A- D (Lockhart et al. 2021). Those bottles were made between 1906 and 1909.

Medicine/extract bottles were the second-most common type of bottle from Trenches A-D, with 51 bottles identified. Medicine bottles were most common type of bottle from Trench A and Trench D, while beverage bottles were more common in Trench B and C. Only one medicine bottle (395.005) from Trench C (Figure 3.13) was identifiable by brand. The embossed cobalt glass bottle of Bromo Seltzer was produced by the Emerson Drug Company of Baltimore, which distributed the product in these colored bottles from 1900 through the mid-20th century (Lockhart et al. 2014). A rectangular amber glass poison bottle (394.004) with "SON" embossed on the side panel and ticking along the bottle corners from Trench C could have held non-consumable medicine like

Figure 3.13. *Glass medicine bottles from Trench C: (a) Small colorless glass Blake Variant 1 shaped bottle with "…R'S" embossed on the side (395.004), (b) Cobalt glass fragment of a Bromo Seltzer bottle made by the Emerson Drug Company of Baltimore (395.005), (c) Nearly complete Philadelphia oval colorless glass medicine bottle with graduated sides (448.002), (d) Medium amber glass poison bottle base embossed "SO" (394.004).*

iodine, liniment, or antiseptics, or it could have held ink, embalming fluids, cleaning products, acid, or some type of pesticide. This bottle was made between 1875 and 1910 (Lindsey 2024).

Several medicine bottles from Trench D had identifying marks (Figure 3.14). A large medium amber bottle contained a patent medicine called "Ozomulsion" (921.020), which contained ozone and cod liver oil. Ozomulsion was made in London, England and in New York City and was said to cure colds, coughs, consumption, and bronchitis. This bottle dates between 1895 and 1925 (Parrington 1981). Another medium amber bottle had a diamond-I mark of the Illinois Glass Company (921.021), which was used between 1900 and 1915 (Toulouse 1971). A smaller colorless bottle is marked "Broadway" on the base (1071.001). This bottle remains unidentified, but it was made in a cup-bottom mold, meaning it dates between 1880 and 1910 (Lindsey 2024).

The most notable difference between Trenches B and C and Trenches A and D is in the quantity of condiment bottles. Condiment and relish bottles made up approximately 20 percent of the bottles identified from Trench A and from Trench D. Only one possible condiment bottle was recovered during the 2022 excavations, and it was not complete enough to determine the bottle or its age with any certainty. Figure 3.15 shows two of the

Figure 3.14. *Glass medicine bottles from Trench D: (a) large medium amber cup-bottom mold made "OZOMULSION" bottle, 1895-1925 (921.020), (b) medium amber cup-bottom mold made medicine bottle with Illinois Glass Company mark, 1900-1915 (921.021), (c) colorless mold-blown medicine bottle with tooled double ring finish and embossed "R", 1880-1920 (923.009), (d) colorless cup-bottom mold made bottle marked "Broadway" on base, 1880-1920 (1071.001).*

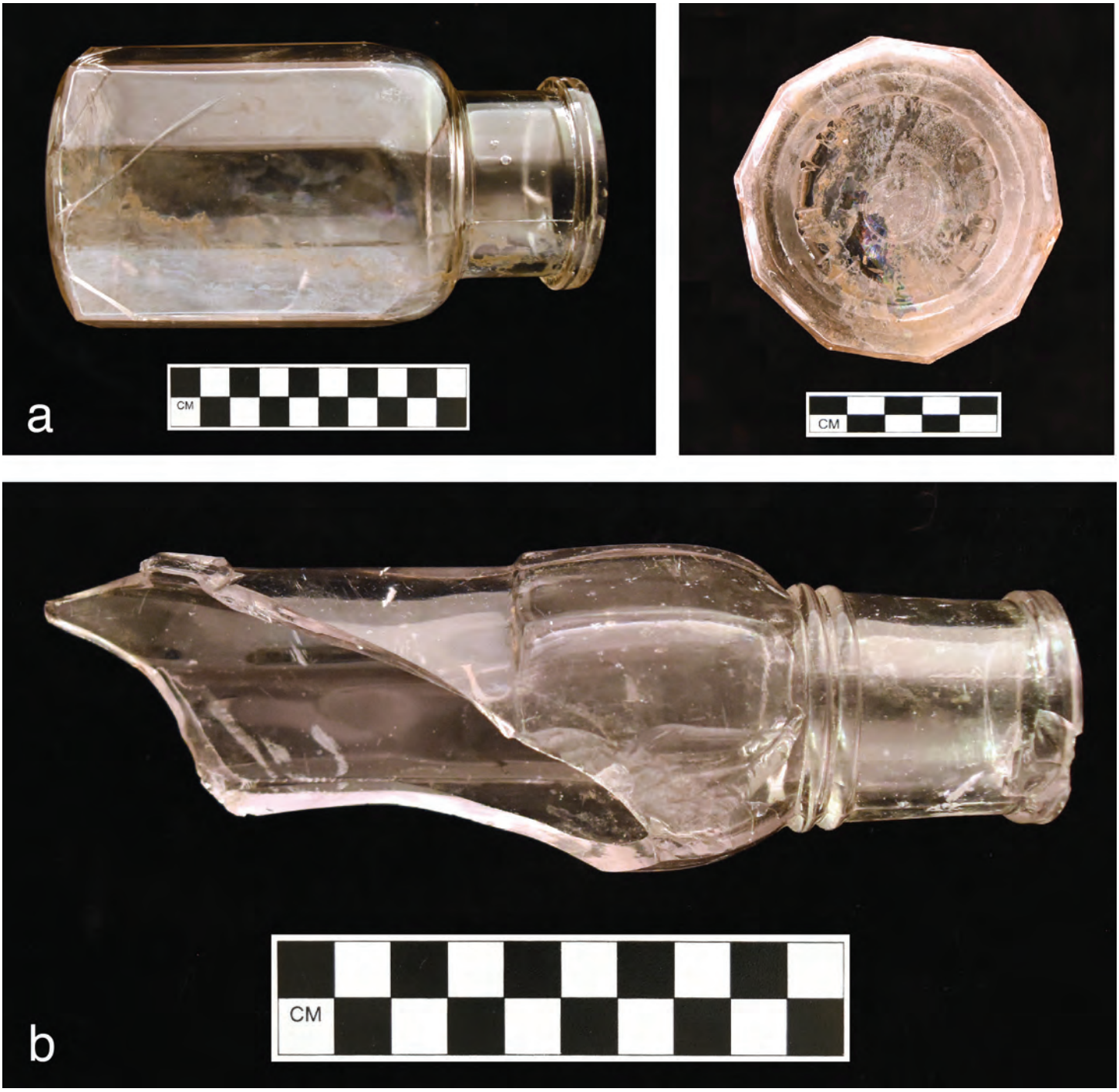


Figure 3.15. *Glass condiment bottles from Trench D: (a) complete colorless 10-sided bottle made with a press-and-blow machine with mark from the H. J. Heinz Company, 1906-1920 (923.006), (b) Colorless mostly complete olive bottle made in a cup-base mold with a tooled capseat style finish, 1880-1910 (921.023).*

condiment bottles from Trench D. One is a complete 10-sided bottle with an embossed mark from the H. J. Heinz Company on the base (923.006). This bottle likely held mayonnaise, olives, or mincemeat and was made between 1906 and 1920. The other is a mostly complete bottle that likely held olives (921.023).

Household bottles, which include ink, glue, and oil bottles made up a very small portion of the typed bottles (Figure 3.16). A bottle of Singer Sewing Machine Oil (425.001) was recovered from Trench C. These bottles, and sewing machines, were very common in households between 1880 and 1930 (Griffin 2014). A complete machine-made Sanford Ink bottle (921.017) was recovered from Trench D.

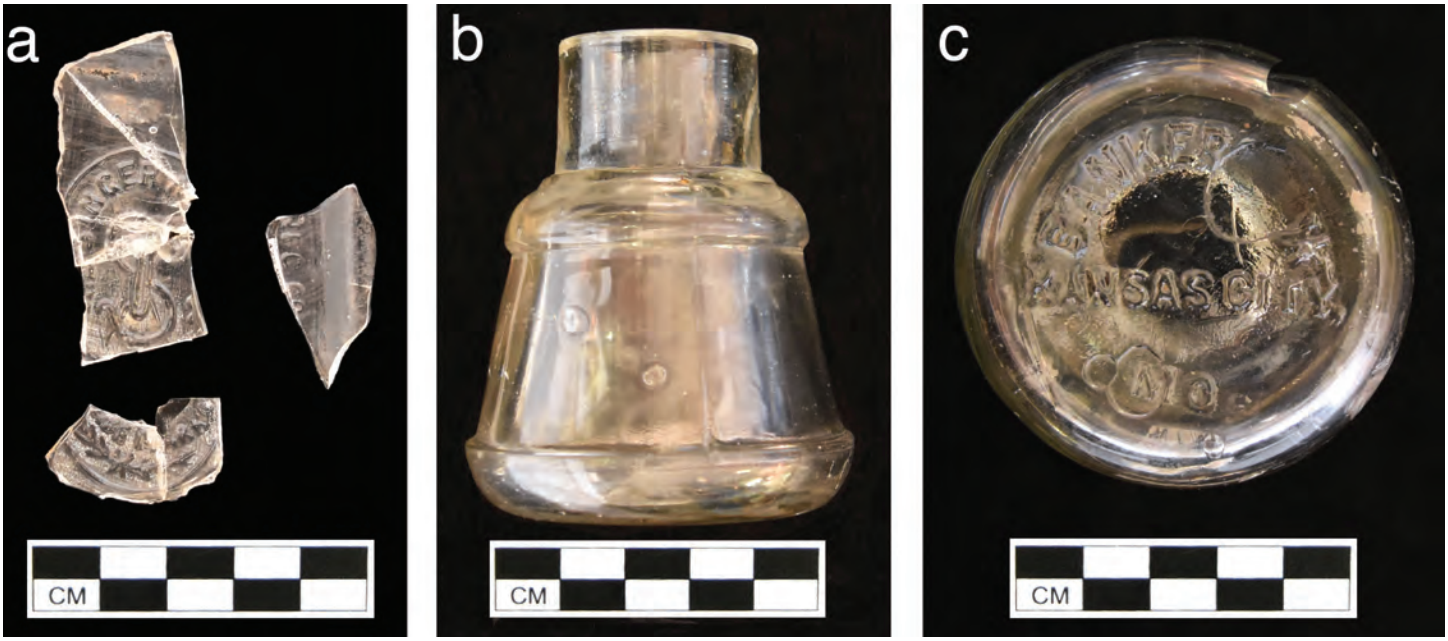


Figure 3.16. *Glass household bottles. (a) Singer Sewing Machine Oil bottle fragments from Trench C, 1880-1930 (425.001) and (b) colorless machine-made Sanford Ink bottle from Trench D, 1910+ (921.017).*

Two toiletry bottles were recovered from Trench D (Figure 3.17). The first (921.019) is a portion of a shampoo bottle with embossed text. The brand has not been identified. The second (921.022) is a nearly complete Listerine mouthwash bottle dated between 1879 and 1918 (Munsey 2006).

Figure 3.17. *Toiletry bottles from Trench D: (a) shampoo bottle with embossed text (921.019) and (b) cup-bottom mold made Listerine mouthwash bottle, 1879-1918 (921.022).*

Tableware is a broad category that includes decorative and functional glass vessels such as tumblers, compotes, goblets, and vases. The percentages of recovered tableware vessels was roughly similar between for Trench A and Trench C, making up between 11 percent of the recovered vessels. Fewer tableware containers were recovered from Trench D, where tablewares made up only 7% of the containers. Trench B had the highest representation of tablewares, at almost 20 percent. A number of the recovered tablewares consist of hollow vessels produced by pressing hot glass into a patterned mold. These patterns remain highly collectible and many can be identified. Figure 3.18 shows tablewares recovered from Trench B and Trench C. None have patterns that can be dated. Figure 3.19 shows tablewares recovered from Trench D. The colorless ribbed tumblers from the 2022 excavations (387.002 and 448.001) have an identical pattern to a ribbed tumbler from Trench D (921.018). One of the 2022 tumblers was from Trench C and the other could not be tied to a trench. These tumblers were sold as containers for food like jams, jellies, and processed meats or snuff and were intended to be reused as drinking glasses. The pattern found on fragment of an unidentified vessel from Trench D (1071.002) was identified the Admiral Pattern by Bryce Higbee and Company, Philadelphia, PA. The pattern was introduced in 1899 and made until 1907.

There are some differences in the types of glass containers recovered from the three excavation seasons. Condiment bottles were far less common in the Trench B and Trench C glass assemblage. Canning jars were also far less common in Trenches B, C, & D. Medicine bottles were more common in the Trench D assemblage than the other contexts. Alcohol and soda bottles were common in all three groups. Despite differences in representation, the container types from all three trenches still appear to represent household refuse.

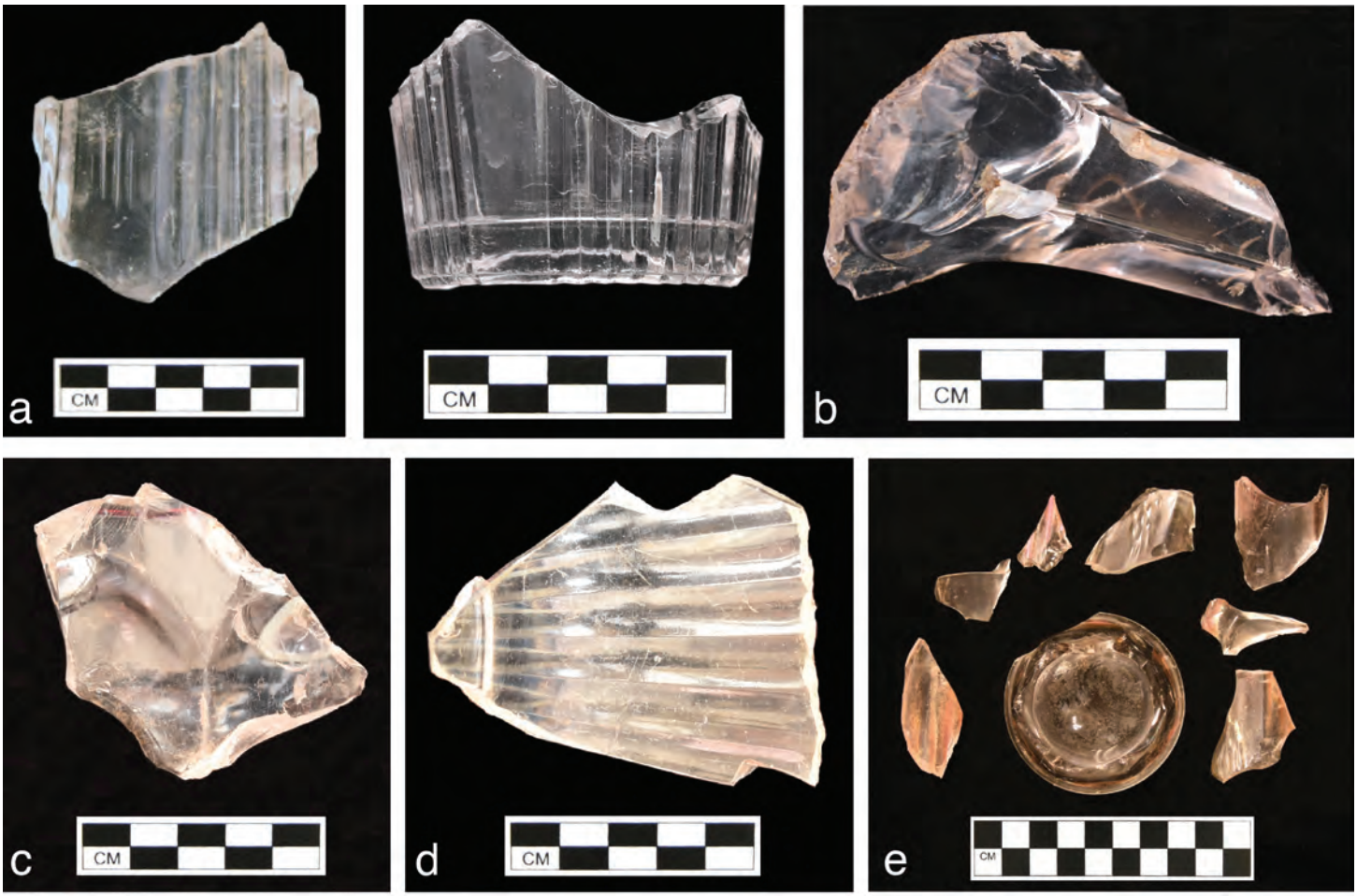


Figure 3.18. *Glass tablewares from the 2022 excavations: (a) body (387.002) and base (448.001) of a ribbed colorless glass tumbler from Trench A re-excavation and Trench B, (b) light amethyst glass hexagonal stem from a compote (442.001, Trench C), (c) body portion of a scalloped press molded colorless glass vessel (394.008, Trench C), (d) body portion of a large fluted glass vessel, likely a bowl (407.004, Trench C), (e) shards from a colorless glass press molded vase with an iridescent finish (419.001, Trench C).*

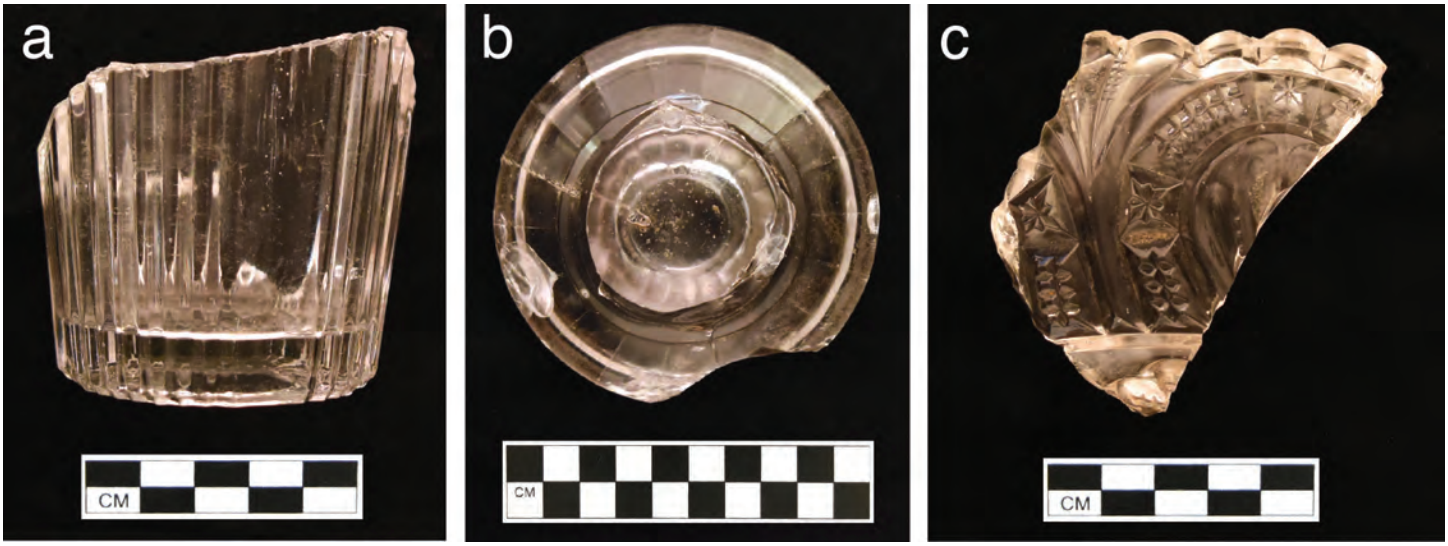


Figure 3.19. *Glass tablewares from Trench D: (a) ribbed colorless glass tumbler (921.018), (b) colorless glass base from stemmed press molded vessel (921.024), (c) colorless rim from an unidentified Admiral pattern vessel by Bryce Higbee and Company, Philadelphia, PA, 1899-1907 (1071.002).*

It would be tempting to state that the Trench C and Trench D glass must be earlier in time, since those glass containers were mostly blown into molds and the Trench A and Trench B glass containers were mostly machine-made. That would be an incorrect statement. The differences in production method between the two assemblages is not due to time but rather due to the different types of containers. Small medicine bottles, which made up a larger portion of the Trench C and Trench D assemblages, were the last category of bottles to transition over to automated production. Medicine bottles were almost all mold-blown until 1920 (Lindsey 2024), while most other categories of glass bottles and jars had switched completely to being machine made by 1910.

A handful of glass fragments have makers marks on the base but otherwise cannot be identified as to vessel type. Figure 3.20 shows makers marks on glass from the 2022 excavations. Two jars (385.004 and 413.003) have marks from the Kerr Glass Company that date between 1915 and 1929 and 1903 and 1918 respectively (Lockhart et al. 2016b). One of these is from Trench C and the other is unprovenienced. A tumbler (388.002) from Trench B has the mark of the Hazel-Atlas Glass Company, which was founded after the merger of two glass companies in 1923 and used as late as 1982 (Toulouse 1971). Another unidentified colorless glass container base (441.002) from Trench C was marked with the diamond logo of the Illinois Glass Company, which was used between 1915 and 1929. The base of an unidentified colorless glass container (441.003) with a yellowish tint (indicating selenium was added to the glass mixture) from Trench C has the "T" in an triangle mark used by the Tygart Valley Glass Company between 1920 and 1930. Finally, another unidentified colorless glass container base from Trench B (618.003) has a mark with an "O" in a square, which is the mark used by Owens Bottle Company between 1920 and 1925 (Toulouse 1971). Figure 3.21 shows one previously-unmentioned bottle base with a mark (922.004) recovered from Trench D. It has the "N" in a rounded rectangle mark used by the Obear-Nestor Glass Company between 1913 and 1918 (Lockhart et al 2018b). Many of these marked bottles post-date the founding of Oaklawn Cemetery. It is likely some of them were placed on graves by mourners or dropped in the cemetery by visitors.

In addition to the glass containers, the Trench A – D assemblages also included flat glass, typically used for windowpanes, glass insulators, and light fixture glass. Three of the flat glass fragments (394.006 and 618.004), from Trench C and Trench B respectively, had an embossed pattern on them (Figure 3.22). These pieces of glass, and other pieces of flat glass from Trench A and from the 2020 sexton area excavations, are an example of rolled glass. Rolled glass was a patterned glass first made in 1890. It was frequently found in Victorian and Craftsman-style homes and maximized light and privacy within the home (Lee 2009). The glass from Trench B and C is decorated in the Florentine pattern. Roller glass is still being produced today, but it is likely that the examples from Oaklawn date to the same period as the rest of the excavations, from 1890 into the early 20th century.

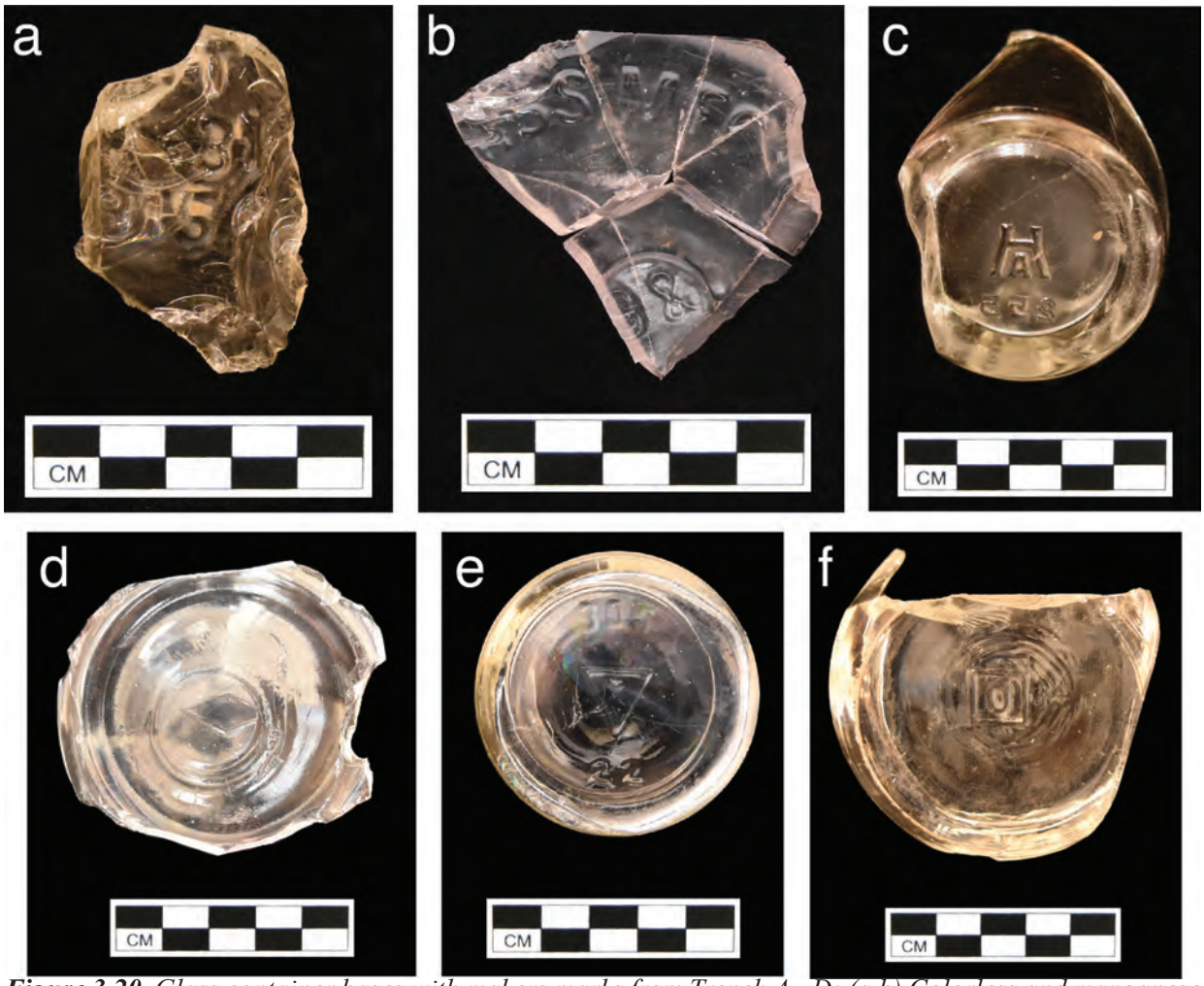


Figure 3.20. *Glass container bases with makers marks from Trench A - D: (a,b) Colorless and manganese jars, Kerr Glass Company (385.004, Trench A re-excavation & 419.003, Trench C), (c) colorless jar/ tumbler, Hazel-Atlas Glass Company (388.002, Trench B), (d) colorless with machine suction scar, Illinois Glass Company (441.002, Trench C), (e) yellowish-tinted with machine suction scar, Turner Glass Company (441.003, Trench C), (f) Colorless with machine suction scar, Owens Glass Company (618.003, Trench B).*

Figure 3.21*. Manganese glass medicine bottle with Obear-Nestor Company mark from Trench D, 1913-1918 (922.004)*

The glass analysis demonstrates a general trend that the dateable glass recovered from Trench B and Trench C is somewhat later than the Trench A and Trench D glass. Most of the dateable glass containers from Trench B and Trench C date after 1900. The marked containers from Trench B and Trench C date later in time, beginning in the 1920s. Many of these later marked containers may have been used as grave decorations when Oaklawn was a cemetery. The later date is also likely because the Trench B and Trench C excavations did not encounter the earlier deep deposits of trash from the allotment and surrounding neighborhoods dumped into the buried stream between 1890 and 1900.

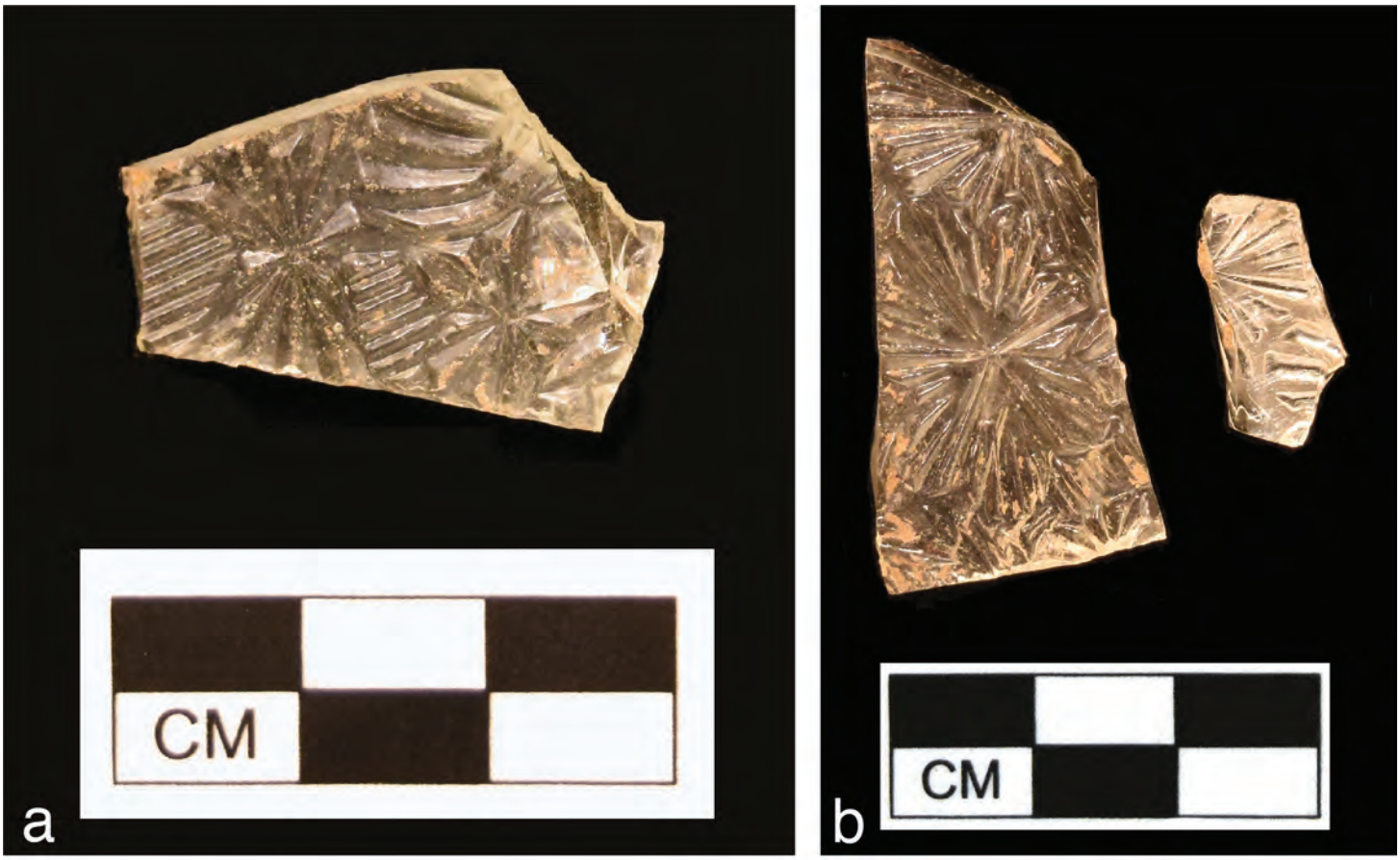


Figure 3.22. *Examples of colorless rolled glass, a form of patterned window glass from the 2022 excavations (394.006 & 618.004). These examples are in the Florentine pattern.*

Metal

Metal artifacts had by far the highest reburial rate. Ninety-eight percent of the metal artifacts from Trench C and Trench D, 99 percent of the metal from Trench A, and 94 percent of the metal from Trench B was reburied. During analysis, the metal artifacts were sorted by metal type, object type, and use group (Table 3.12). Very few of the recovered metal artifacts can provide any dating information Just over 55 percent of the metal artifacts from Trench B and Trench C were unidentifiable, heavily rusted fragments of ferrous metal. This is a lower percentage than the Trench A and the Trench D unidentifiable ferrous metal, both of which made up 70 percent of their respective assemblages. The Trench A excavations into the deeply buried stream recovered a large quantity of thick unidentified ferrous metal fragments. None of these large fragments were recovered during the Trench B and Trench C excavations, which did not touch the stream. Most of the unidentified ferrous metal fragments from Trench D were fragments of thinner flat metal, rather than large fragments likely from cast iron objects in Trench A.

The second most common category of metal artifact from Trenches B & D were wire nails. Wire nails, which have a round shank, were introduced at the tail end of the 19th century. They were adopted in coffin construction by 1890 and in building construction by 1900. Nails were completely absent from the Trench A metal artifacts Fragments of metal cans and wire were common in Trench B and Trench C and non-existent in Trench D. Only three can fragments were recovered from Trench A. Multiple railroad spikes, presumably associated with the rail line that ran west of Oaklawn in the early 20th century, were recovered in from Trenches A – D. Horse and mule shoes were recovered from Trench A and B but not from Trench C and D.

The most notable metal artifacts from the Trench B & C excavations are a series of cuprous metal, probably brass, clothing or jewelry fragments (Figure 3.23). These include a buckle, a rivet, and an oval frame that likely

Table 3.11. Metal artifacts recovered from Trenches A - D at Oaklawn Cemetery.

Artifact Category	Trench A		Trench B		Trench C		Trench D		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Unidentified Ferrous Metal	662	68.1	1	3.1	21	8.3	29	26.9	713	52.2
Cut Nails	0	0.0	0	0.0	1	0.4	0	0.0	1	0.1
Wire Nails	0	0.0	2	6.3	46	18.1	23	21.3	71	5.2
Other hardware	199	20.5	0	0.0	7	2.8	2	1.9	208	15.2
Temporary grave marker	50	5.1	0	0.0	1	0.4	0	0.0	51	3.7
Unidentified flat ferrous metal	31	3.2	6	18.8	126	49.6	47	43.5	210	15.4
Corrugated sheet metal	0	0.0	8	25.0	0	0.0	0	0.0	8	0.6
Railroad spikes	8	0.8	0	0.0	4	1.6	2	1.9	14	1.0
Ferrous metal rods	4	0.4	0	0.0	1	0.4	0	0.0	5	0.4
Cans/lids	3	0.3	10	31.3	19	7.5	0	0.0	32	2.3
Wire (Barbed/Baling)	0	0.0	2	6.3	14	5.5	0	0.0	16	1.2
Metal straps	3	0.3	0	0.0	1	0.4	0	0.0	4	0.3
Unidentified Cuprous Metal	4	0.4	0	0.0	1	0.4	1	0.9	6	0.4
Ammunition	0	0.0	0	0.0	0	0.0	1	0.9	1	0.1
Cuprous clothing hardware	1	0.1	1	3.1	6	2.4	0	0.0	8	0.6
Horseshoe/Mule shoe	1	0.1	1	3.1	0	0.0	0	0.0	2	0.1
Crown bottle cap	0	0.0	0	0.0	2	0.8	2	1.9	4	0.3
Cutlery	1	0.1	0	0.0	1	0.4	0	0.0	2	0.1
Stabilizer bar	0	0.0	0	0.0	1	0.4	0	0.0	1	0.1
Unidentified lead fragment	0	0.0	0	0.0	1	0.4	0	0.0	1	0.1
Unidentified white metal	0	0.0	1	3.1	1	0.4	0	0.0	2	0.1
Handle fragments	2	0.2	0	0.0	0	0.0	1	0.9	3	0.2
Pocket watch	1	0.1	0	0.0	0	0.0	0	0.0	1	0.1
Furniture parts	1	0.1	0	0.0	0	0.0	0	0.0	1	0.1
Ferrous metal tray	1	0.1	0	0.0	0	0.0	0	0.0	1	0.1
Total	**972**	**71.2**	**32**	**11.0**	**254**	**18.6**	**108**	**7.9**	**1366**	**100.0**

came from a piece of jewelry. Other clothing-related artifacts (Figure 3.24) include a 2-hole ceramic button (394.009) from a child's undergarments from Trench C and a black faceted glass imitation jet button (397.001) from Trench B. Both of these artifacts date to the late 19th through the early 20th century. Only two notable metal artifacts were recovered from Trench D (Figure 3.25). These include a .22 caliber shell casing (1053.002) and a coiled piece of ferrous metal (1054.001).

Other artifacts

The "Other artifacts" category includes architectural debris, faunal material, and an artifact from the pre-contact period. Only two artifacts in this category were recovered from Trench B. These include a brick fragment and a piece of marble. The Trench C other materials include 18 artifacts, 12 of which were reburied. Of these, nine are faunal remains (animal bone), eight are architectural debris, and one is a precontact artifact. This artifact (394.012, Figure 3.26) is a small piece of worked Burlington chert identified by University of Oklahoma doctoral student J.T. Lewis. The piece has been knapped along one edge to create a tool. Burlington chert naturally occurs along the Mississippi River in the American Bottom region, near St. Louis. This chert is widely distributed across the southeastern United States. This artifact was almost certainly made by the people who lived in the Tulsa area and was made prior to contact with European colonists in the 18th century. Only 4 artifacts from this category were recovered from Trench D. Two were faunal remains, one was an unmarked brick fragment, and the third (Figure 3.27, 922.006) was a brick fragment marked with concentric circles.

Figure 3.23. *Cuprous metal artifacts from the 2022 excavations: (a,b) small oval frames, possible from jewelry, (394.011 & 395.008, Trench C), (c) small metal bead with portion of ball chain (397.002, Trench B), (d) clothing rivet (474.002, Trench C), and (e) belt buckle with cuprous frame and ferrous metal prong (492.002, Trench C).*

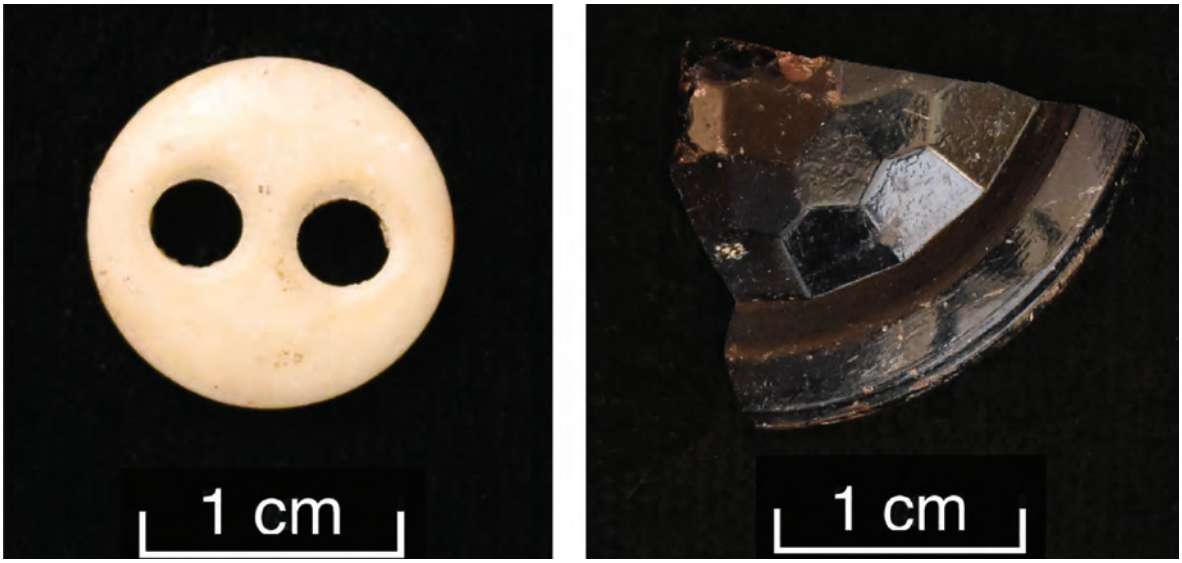


Figure 3.24. *Buttons from the 2022 excavations: (left) bisque button from corsets or undergarments, 19th - early 20th century (394.009, Trench C) and (right) portion of a faceted black glass button popular during the Victorian period (397.001, Trench B).*

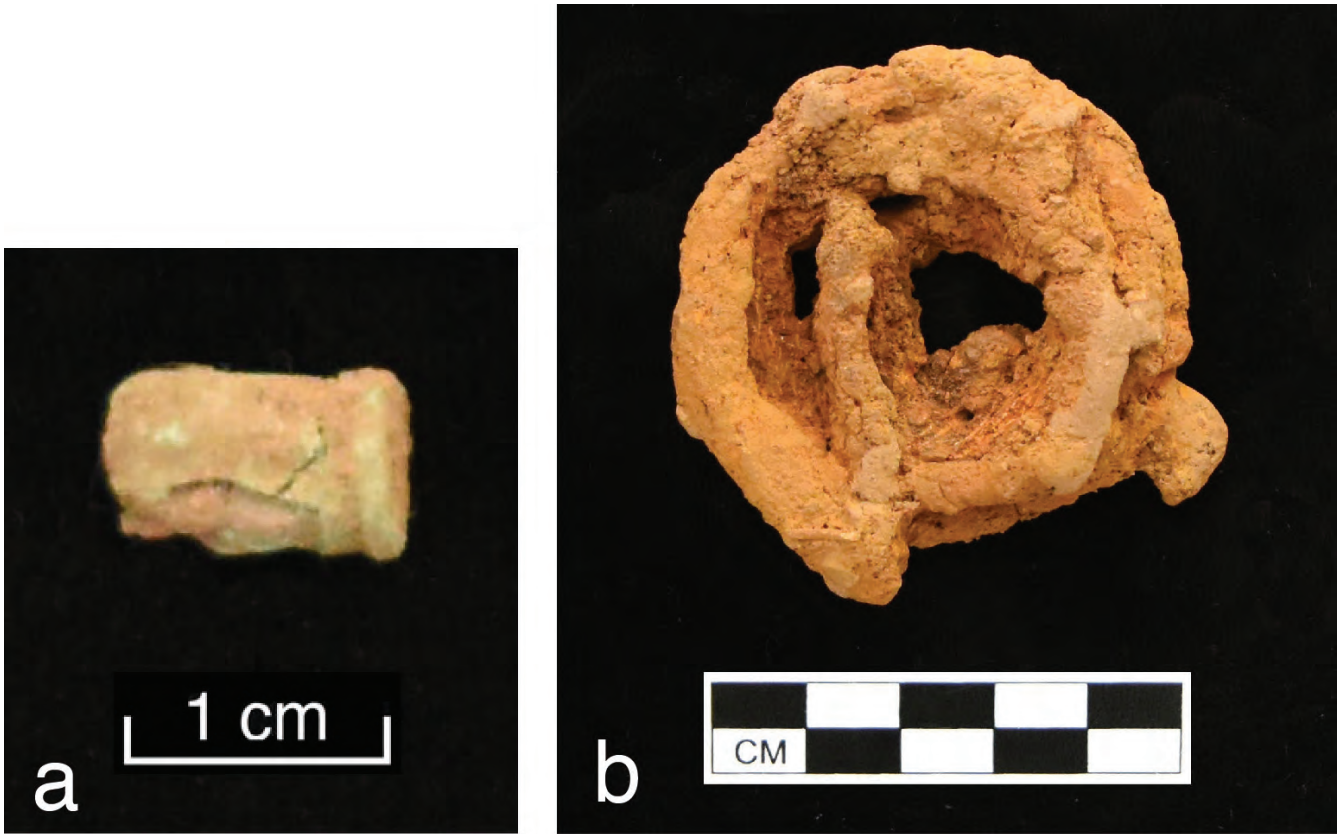


Figure 3.25. *Metal artifacts from Trench D: (a) .22 caliber shell casing (1053.002) and (b) coiled piece of ferrous metal (1054.001).*

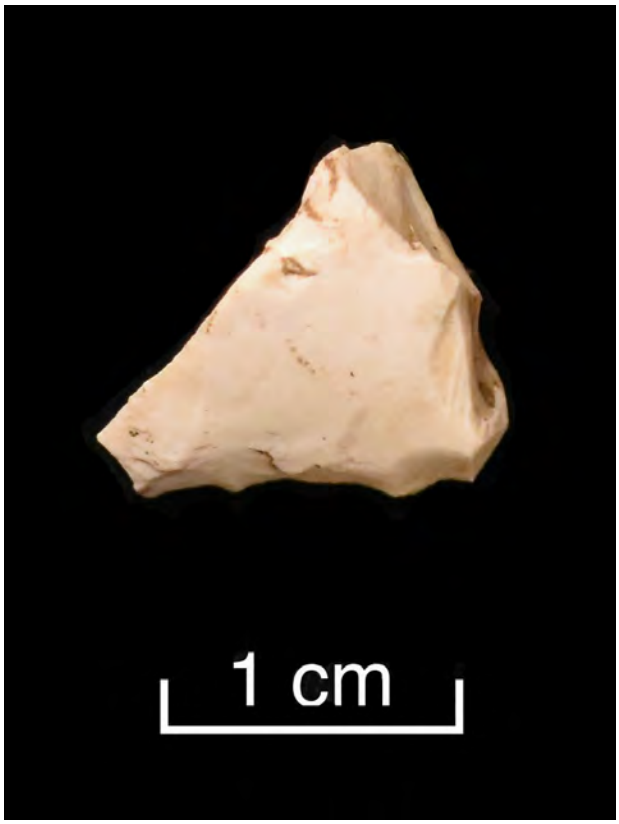


Figure 3.26*. The only precontact artifact recovered from any of the Oaklawn Cemetery excavations is this small unifacial tool made from Burlington chert (394.012).*

Figure 3.27*. Brick with concentric circles from Trench D (922.005).*

Trench A – D Artifact Density and Distributions

The artifact assemblage from Trenches A – D consists of 3,672 artifacts.[1] Table 3.12 shows the counts of artifacts, size of the trenches in square meters, and the counts for artifacts per square meter. The cumulative density in Trench A – D was 7.9 artifacts per square meter. The density of artifacts within each trench varied widely across the individual trenches. Trench B had the lowest artifact density, with only 1.6 artifacts per square meter and Trench D had the greatest density at 13.5 artifacts per square meter.

Table 3.12. Artifact density in Trenches A - D at Oaklawn Cemetery.

Trench	Artifact totals	Area in square meters	Artifacts per square m
A	1858	206	9.0
B	149	96	1.6
C	935	112	8.3
D	700	52	13.5
Total	**3,672**	**466**	**7.9**

Tracking the general locations where artifacts were recovered from Trench A proved very useful for understanding the artifact distributions and reconstructing the past landscape at Oaklawn. This method was used again during the 2022 and 2023 excavations. Horizontal control was far better than vertical control, which is mostly based on notes recorded during excavation. Like the Trench A excavations, the upper strata of soil had a lower density of artifacts. The artifacts recovered from the upper levels dated after 1920. The upper levels have been interpreted as zones of fill used to raise the ground level in the southwest corner of Oaklawn Cemetery (see Green et al. 2022 and Regnier 2022 for those interpretations). As with Trench A, artifacts in Trenches B – D were recovered at the transition to the late 19th – early 20th century ground surface that occurred at about 170 cm (67 inches) below the ground surface.

Figure 3.28 shows the locations of vessels that cross-mend in Trenches A – D. This only includes ceramics that refit or are clearly from the same vessel. A number of the flow blue ceramics are decorated with the Mentone pattern by Alfred Meakin and Company, but it is clear from the vessel forms and the makers marks that despite having the same decorated pattern these sherds are not from the same vessel. Cross-mended ceramics were present between Trench A & C and Trench A & D. No mending ceramics were recovered from Trench B and no mends occurred across Trench C & D. The Trench B & C excavations had a much lower density of artifacts than the Trench A and Trench D excavations. This was both expected and unexpected. The density of artifacts in the northwest portion of Trench A was low, and, as expected, that same pattern continued in Trench B. It was difficult to predict what the artifact density would be in Trench C. There was some concern that the artifact density would be as high or higher in the area where the buried stream was located. That did not prove to be the point. Trench D continued the pattern of high artifact recovery along the eastern edge of Trench A

[1] Ten artifacts from the 2022 field season were recovered from the Trench B & C excavation back dirt or during the re-excavation of Trench A to recover additional DNA samples. Those artifacts are not included in the Trench A – D artifact tables since their provenience cannot be tracked to a specific trench. As a result, the cumulative artifact totals from all three field seasons will be different than the artifact totals from specific trenches.

Figure 3.28. *Locations of cross-mended artifacts from Trenches A, B, C, and D.*

Maps showing artifact recovery by context were created in order to better understand the artifact distribution across Trenches A - D. In the Trench A artifact analysis, only artifact counts were used to assess artifact density (Regnier 2022). For this analysis, two distribution maps were produced. One shows artifact counts (Figure 3.29) and the other shows artifact weights (Figure 3.30). It is crucial to consider both types of data because artifacts were broken into more pieces in the dry soils of the Trench B & C excavations.

The artifact count map shows a dense concentration of artifacts on the eastern side of the units, with the area of densest recovery in the northeast corner of Trench D. There is a general northeast-southwest trend line of high artifact density from Backhoe Row 2 in Trench A. This line roughly follows the submerged stream that crosscuts the excavation blocks. Another concentration of artifacts is evident along the east edge of Trench C. The map of artifact weights provides a different, but complementary view of the artifact concentrations. The weight contours show the same northeast-southwest line of high density areas. Trench C has a lower cumulative weight of artifacts, with the highest recovery along the eastern edge of the southern trench extension. Because of the higher amount of artifact breakage, the weights of recovered artifacts from contexts in Trench C are lower than contexts in Trench A wiht equivalent artifact counts. The density by weight map is a more accurate reflection of what was observed in the field during both excavation seasons. Both the count and weight contours show and interesting trend of increasing artifact density at the west end of Trench B, which may indicate more artifacts would be present if excavations were extended to the west at any point.

The four trenches had variable artifact densities. All four artifact assemblages include domestic trash, indicating that these artifacts are refuse from earlier households in the area and largely not associated with the

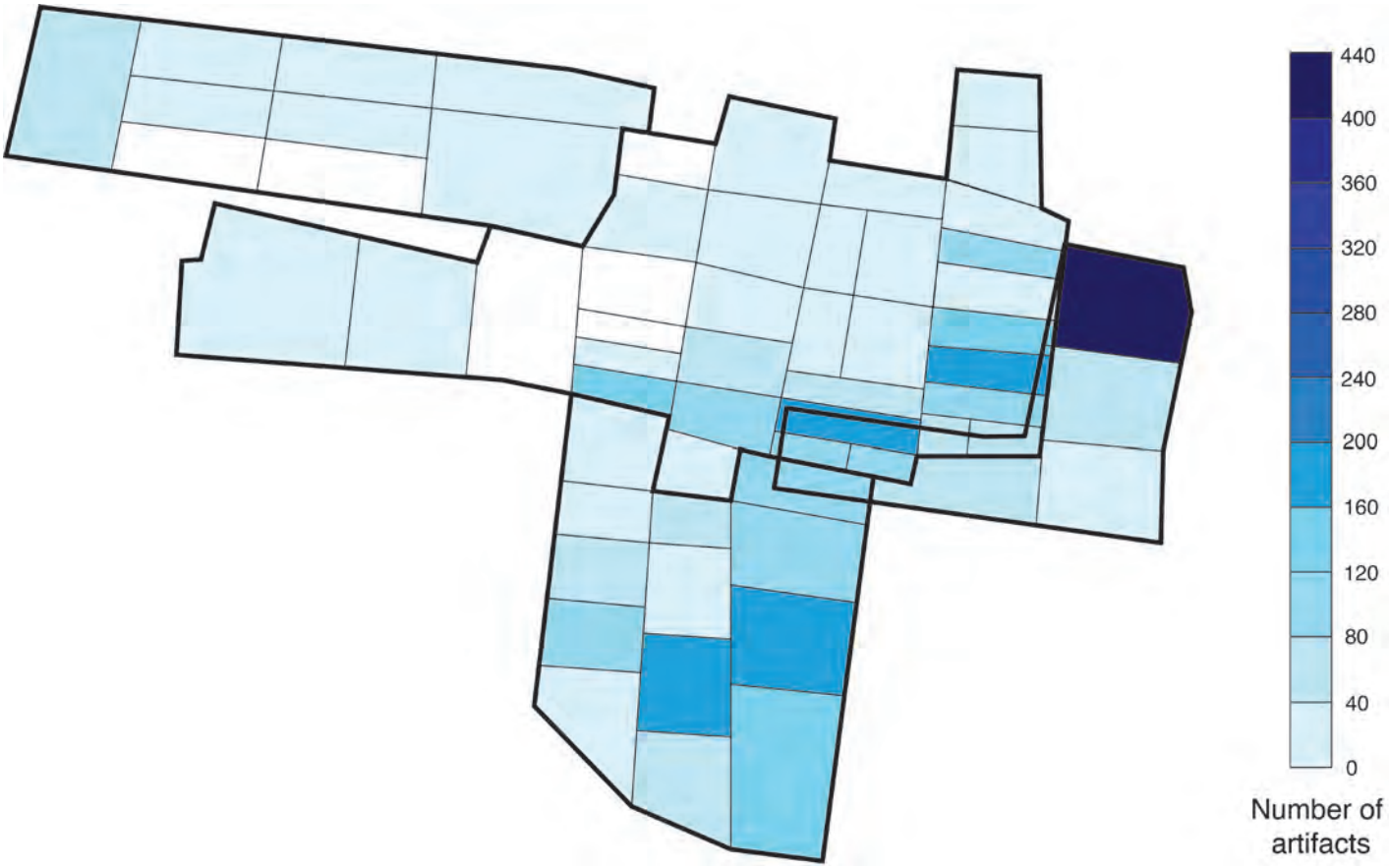


Figure 3.29. *Artifact counts by context in Trenches A – D showing areas of heaviest recovery..*

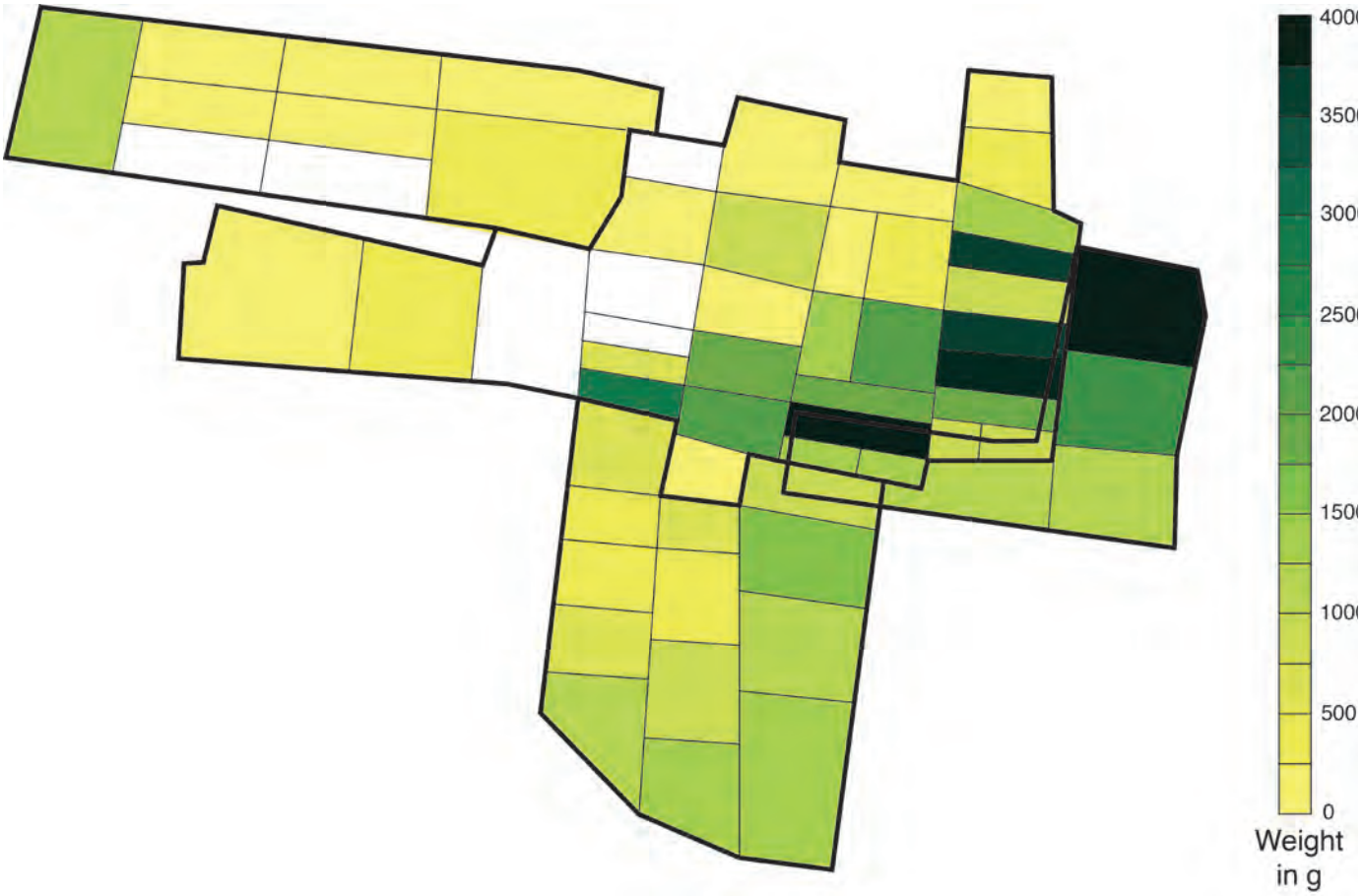


Figure 3.30. *Total artifact weights by context in Trenches A – D..*

use of the area as a cemetery. The Trench B and C excavations did not encounter the same buried stream from the Trench A excavations, where it appears that late 19th and early 20th century residents of the surrounding area discarded the bulk of their trash. Trench D did encounter that area and excavations show a continuation of the northeast-southwest trend of high density artifacts that started in the southern end of Backhoe Row 2 (BH 2). The artifacts from Trench D are contemporaneous with the artifacts from Trench A, with most dating to the same roughly 1890 – 1910 time period.

The density of artifacts in Trench B and Trench C is much lower and there are fewer artifacts from the last decades of the 19th century in that assemblage. Most of the glass containers from the Trench B and Trench C excavations date after 1900, which does overlap with some of the later artifacts in the stream. It may be that better vertical control of the excavations along the stream would show some stratification of artifacts, with the artifacts recovered from greater depths being slightly earlier in time. With the nature of artifact recovery and excavation goals, this is unlikely to happen. The current recovery methods do allow us to draw the most important conclusion, that most of the artifacts are not associated with, and in fact, predate the use of this area as a cemetery. The few artifacts from the Trench B and Trench C excavations that date to the use of the area as a cemetery, after 1917, are likely either grave decorations placed in memory of the people buried in this corner of Oaklawn Cemetery in the early 20th century or containers dropped by cemetery visitors.

The Non-Mortuary Artifacts from Trench E

A total of 6,662 artifacts were recovered from Trench E (Table 3.14). The glass assemblage was narrowly largest, with 2,848 total artifacts. This was followed closely by metal at 2,806 artifacts. The other materials category was the smallest at 251 artifacts. The Trench E artifacts were divided into two different contexts. Initially, Trench E was excavated to a depth of between 25 and 30 cmbs, where metal temporary grave markers and bricks were observed and mapped on what was likely the 1920s ground surface. Grave decorations, including glass and ceramic vessels, were noted in association with these markers. Once these features were mapped, the trench was excavated to a depth at which grave shafts were visible.

Table 3.13 does not include the 11 percent of artifacts recovered from the backdirt piles or otherwise unknown elevations in the trench. Just over a tenth of the artifacts from Trench E came from the shallow portion of the excavations. Glass made up 54 percent of the shallow assemblage from Trench E. Slightly more than ¾ of the artifacts came from the deeper portions of Trench E. Glass was narrowly the largest category of artifacts from the deeper portions of Trench E, making up 43 percent of that assemblage. Metal artifacts made up 42 percent of the deeper Trench E artifacts and only 16 percent of the shallow Trench E assemblage. This is partially because the deeper artifacts include screened artifacts from burial shafts and coffin fill, which includes wire nails and other metal fragments from coffins. The metal artifacts from the grave shafts were or will be reburied in their respective burial shafts. Ceramics made up a slightly greater portion of the deeper artifacts. Other materials, particularly faunal material made up a much greater portion of the shallow artifacts, 20 percent of the shallow assemblage as opposed to three percent of the deeper.

Table 3.13. Artifacts recovered from the shallow and deep contexts in Trench E by type.

Material Type	Trench E Shallow				Trench E Deep				Trench E Totals			
	Count	%	Weight (g)	%	Count	%	Weight (g)	%	Count	%	Weight (g)	%
Ceramics	82	10.6	783.4	6.0	576	10.8	11159.8	21.2	757	11.4	12751.6	17.6
Glass	501	64.8	3605.0	27.8	2093	39.1	19519.1	37.0	2848	42.7	25301.3	34.8
Metal	132	17.1	4427.3	34.1	2511	46.9	18254.0	34.6	2806	42.1	23626.1	32.5
Other Materials	58	7.5	4173.9	32.1	172	3.2	3758.3	7.1	251	3.8	10944.8	15.1
Total	**773**	**11.6**	**12989.6**	**17.9**	**5352**	**80.3**	**52691.2**	**72.6**	**6662**	**100**	**72623.8**	**100.0**

Table 3.14 presents the counts of reburied artifacts from the shallow and deep contexts by material category. Ninety percent of the recovered artifacts were reburied. A higher percentage of the artifacts from the shallow portions of the trench, about 17 percent, were retained, while only 10 percent of the deep artifacts were retained. As expected, metal had the highest reburial rate, which was 99 percent for both the shallow and the deep contexts from Trench E. Other materials had the lowest reburial rate, at 60 percent from the shallow contexts and only roughly 40 percent from the deep contexts.

Table 3.14. Reburial rates for artifacts recovered from the shallow and deep contexts in Trench E.

Material type	Trench E Shallow				Trench E Deep				Trench E Totals			
	Total	Kept	Reburied	%	Total	Kept	Reburied	%	Total	Kept	Reburied	%
Ceramics	82	31	51	62.2	576	153	423	73.4	757	198	548	72.4
Glass	501	75	426	85.0	2093	212	1881	89.9	2848	306	2542	89.3
Metal	132	2	130	98.5	2511	18	2493	99.3	2806	38	2768	98.6
Other Materials	58	23	35	60.3	172	107	65	37.8	251	131	120	47.8
Total	**773**	**131**	**642**	**83.1**	**5352**	**490**	**4862**	**90.8**	**6662**	**673**	**5978**	**89.7**

Ceramics

Table 3.15 shows the ware counts for Trench E from shallow and deep contexts. The percentages of whitewares are similar, making up 40 percent of both contexts. Stoneware was the next most common type from the shallow assemblage at 18 percent, while porcellaneous wares were second most common at 24 percent of the deep ceramics. Ironstone was more common in the deeper levels, making up 12 percent of that assemblage. Other refined earthenwares and bisque porcelain were more common in the shallow contexts, both making up 10 percent of that assemblage.

Table 3.15. Ceramic ware types recovered from the shallow and deep contexts in Trench E.

Field Season	Trench E Shallow		Trench E Deep		Trench E	
Ware Type	Count	%	Count	%	Count	%
Whiteware	33	40.2	231	40.5	300	41.2
Ironstone/White Granite	4	4.9	67	11.7	82	11.2
Yellow ware	0	0.0	13	2.3	16	2.2
Other refined eathernwares	8	9.8	18	3.2	26	3.6
Bisque	8	9.8	3	0.5	11	10.3
Porcellaneous Ware	12	14.6	135	23.6	171	23.5
Stoneware	15	18.3	74	13.0	107	14.7
Coarse Earthenware	1	1.2	4	0.7	5	0.7
Redware	1	1.2	3	0.5	6	0.8
Ceramic Tile	0	0.0	5	0.9	5	0.7
Toilet wares	0	0.0	18	3.2	18	0.0
Total	**82**	**11.2**	**571**	**78.3**	**729**	**108.8**

The types of decorated ceramics from Trench E are shown in Table 3.16. The assemblage of decorated sherds from the shallow context is small (Figure 3.31). Molded ceramics are the most common decorated sherds in both shallow and deep contexts. The art glaze category from the shallow contexts consists of the other refined earthenware sherds from decorative vessels. These make up 20 percent of the decorated sherds from the shallow contexts. Other sherds from the shallow context may be from ceramics placed on graves, including the hand-painted sherds (706.001, 708.001, and 729.012) from an early to mid-20th century vase and six of the seven transfer-printed sherds from a vessel with a square base (699.001). A single dark blue transfer-printed sherd (702.001) was also recovered from the shallow context. Two sherds of blue edgeware (694.003 and 739.001), the smaller of which was from the deeper context, resemble 19th century motifs, but the ceramic ware confirms that these sherds date to the 20th century.

The fourteen glazed stoneware sherds from the shallow context date from the late 19th through the mid-20th century (Figure 3.32). The sherds include Bristol exterior and Albany interior sherds from the late 19th to early 20th century, Bristol slip sherds from the 20th century, and a molded Bristol slip sherd with cobalt painting (708.002) from the 20th century (Figure 3.33). A salt-glazed exterior sherd with Albany slip interior from the

Table 3.16. Ceramic decorative types recovered from the shallow and deep contexts in Trench E.

Decorative Type	Start Date	Peak Popularity	Trench E Shallow		Trench E Deep		Trench E	
			Count	Percent	Count	Percent	Count	Percent
Molded	1660+	1870-1950	14	36.8	136	54.8	160	52.6
Edgeware	1775+	1790-1860	1	2.6	1	0.4	2	0.7
Flow blue transfer-printed	1841+	1890-1904	0	0.0	1	0.4	1	0.3
Transfer-printed	1783+	1820-1870	7	18.4	21	8.5	28	9.2
Spongeware/Spatterware	1820+	1840-1950	0	0.0	21	8.5	24	7.9
Copper luster	1850+	1850-1900	1	2.6	7	2.8	8	2.6
Japanese Geisha Girl	1875+	1875-1960	0	0.0	6	2.4	6	2.0
Hand-painted	1775+	1820-1920	6	15.8	0	0.0	3	1.0
Multi-color overglaze decal	1875+	1900-1950	1	2.6	39	15.7	52	17.1
Variegated	1800+	1800-1815	0	0.0	7	2.8	7	2.3
Colored, Fiesta Style Glaze	1926+	1936-1970	0	0.0	4	1.6	4	1.3
Art glaze	1910+	1920-1950	8	21.1	5	2.0	9	3.0
Totals			**38**	**12.5**	**248**	**81.6**	**304**	**97.0**

early to late 19th century was recovered from the backdirt (729.018). The deeper sherds included Albany, Bristol/Albany, and Bristol slip sherds, along with sherds with a Bristol exterior and a salt-glazed interior. These sherds appear to be from a single vessel, and the salt-glazed effect on the interior may not have been intentional, since the slip still has the light gray color typical of Bristol slip. One of the Bristol slip sherds (820.001), from the base of a crock, was decorated with dark blue pigment applied with a sponge. Six of the stoneware sherds were from three mixing bowls dating to the early 20th century. One (826.006) had a molded blue-glazed exterior and a Bristol slip interior. Six sherds (729.011, 751.001, 759.001, 913.001, and 1084.001) refit from a mixing bowl with an unglazed exterior with a light blue glazed interior. One sherd (757.011) was from the unglazed molded rim of a mixing bowl with a white glazed interior.

A greater variety of decorative sherds were recovered from the deeper contexts (see Table 3.15). Over half of the decorated sherds were molded (Figure 3.35). The molded sherds include whiteware, porcellaneous

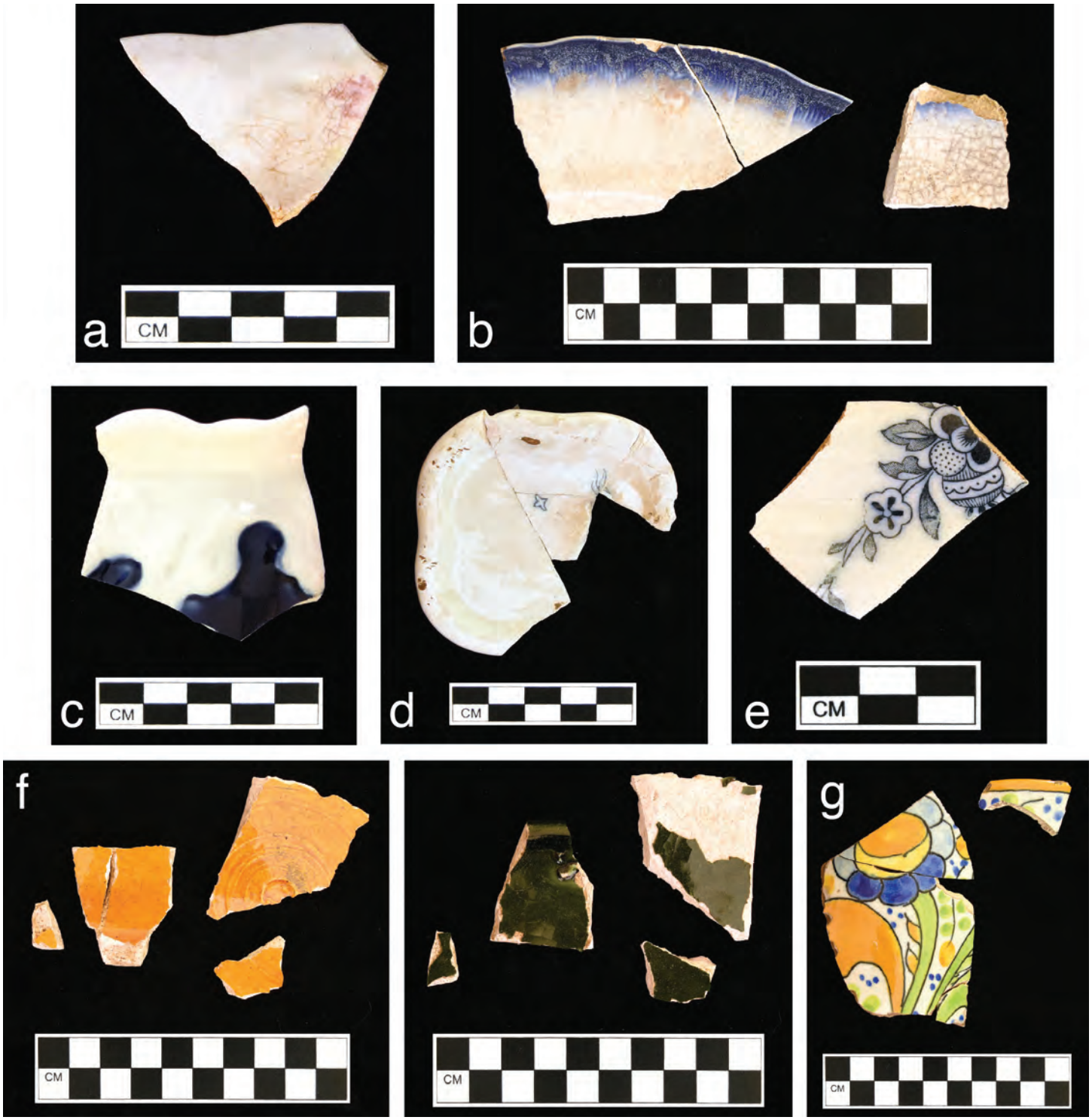


Figure 3.31. *Decorated refined earthenwares from the shallow portion of Trench E: (a) molded whiteware rim with faded floral overglaze decal (694.002), (b) molded and blue edge-decorated whiteware plate rim (694.003 and 739.001), (c) molded porcellaneous ware with hand-painted cobalt (694.004), (d) transfer-printed whiteware vase base (699.001), (e) dark blue transfer-printed whiteware plate rim, (f) refined earthenware with gold glazed interior and green glazed exterior (694.006 and 761.002), (g) hand-painted whiteware with floral motif (706.001, 708.001, and 729.012).*

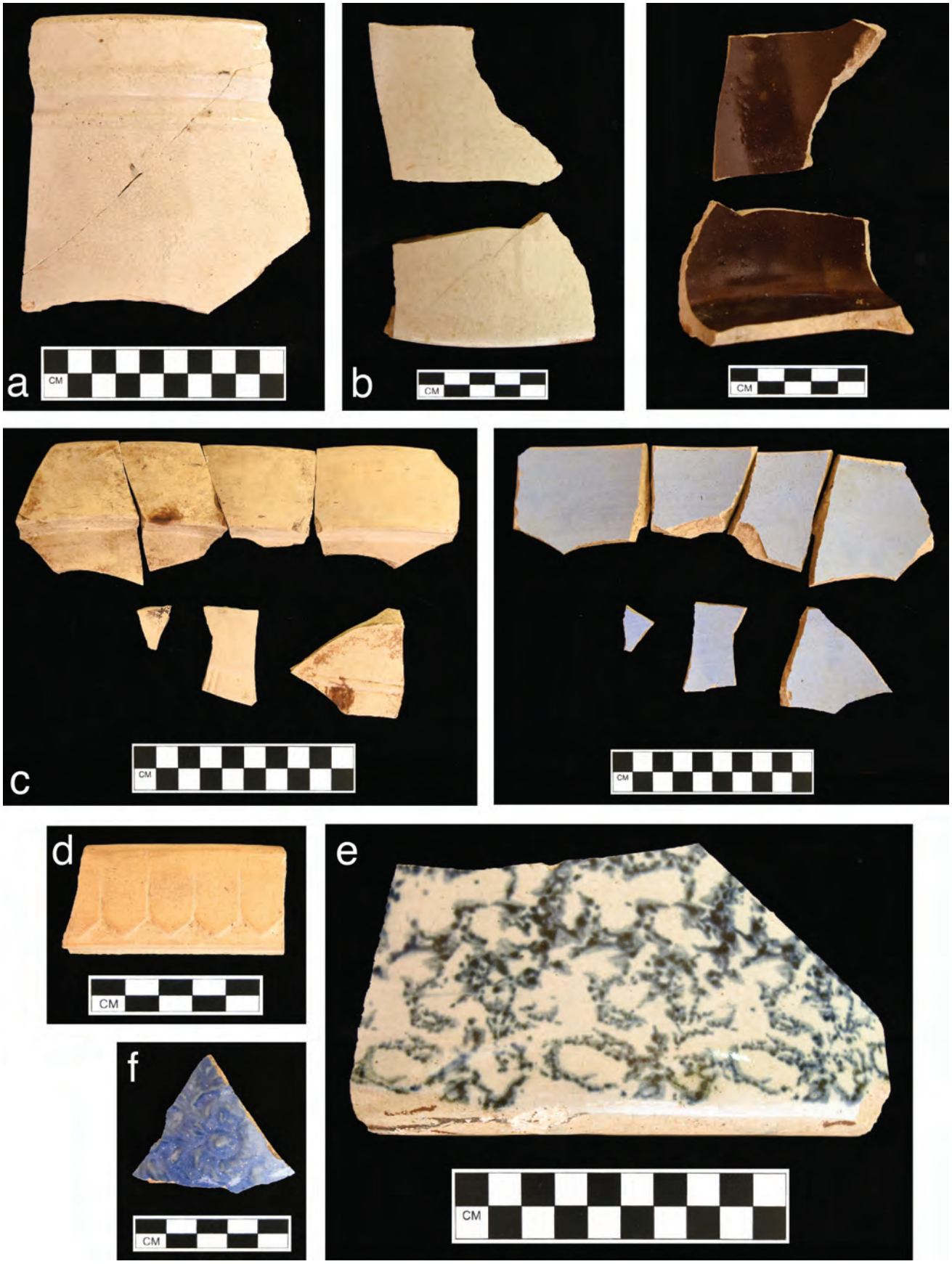


Figure 3.32. *Stoneware sherds from the deep contexts in Trench E: (a) molded Bristol crock rim (726.001), (b) Bristol exterior/Albany interior crock base (747.001), (c) molded mixing bowl with unglazed exterior and light blue glazed interior (729.011, 751.001, 759.001, 913.001, and 1084.001), (d) molded mixing bowl rim; interior has white glaze (757.011), (e) cobalt blue sponge-decorated Bristol crock base (820.001), (f) molded stoneware with blue glazed exterior/Bristol interior (826.006).*

ware, and ironstones from a variety of vessel forms. The ironstones date to the late 19th century and the porcellaneous wares date a bit later, to the early 20th century. A number of the sherds are from a refined earthenware vase with a matte early 20th century art pottery style glaze. The molded porcellaneous wares are contemporaneous with the overglaze decal decorated wares from the deep contexts (Figure 3.34), which are the second most-popular category of decorated sherds and make up 16 percent of the deep decorated sherds. The decal decorated sherds include most of an oblong porcellaneous ware vessel with molded decorations around the rim (742.001). This vessel has a mark on the base that reads "Imperial Crown China Austria." The mark is from a Bohemian ceramic importer founded in 1883 that operated until 1914.

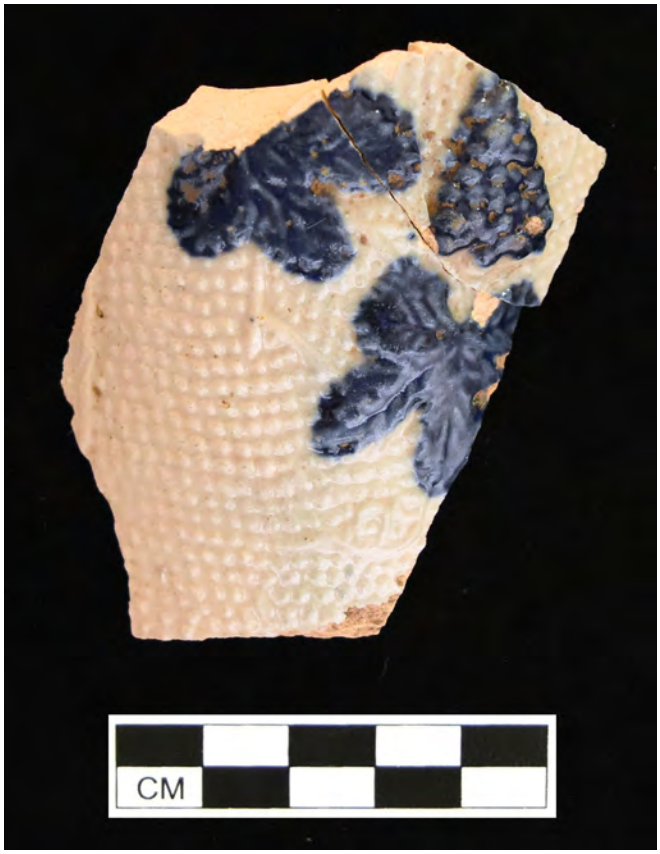


***Figure 3.33**. A Bristol molded stoneware sherd (708.002) with cobalt hand-painted leaves made in the early to mid-20th century from the shallow portion of Trench E.*

Transfer-printed (Figure 3.36) sherds make up 9 percent of the decorated ceramics. The transfer-printed sherds are brown, brown with clobbering, teal, medium blue, flow blue, and green. Three sets of sherds resemble mid-19th century transfer-printed types, including three clobbered brown transfer-printed with yellow and green fill (826.007), three teacup rims with green transfer-printed motifs on both sides (752.001, 755.001, and 756.001), and green transfer-printed sherds from the rim of a plate (861.001 and 863.001). Three brown transfer-printed sherds (732.001, 767.002, and 782.002) are from a plate with an aesthetic motif. The plate has a partial mark on the base that identifies it as part of the Victoria or the Albert pattern, made by J. R. Wileman of the Foley Potteries in Staffordshire, UK between 1872 and 1892. Three teal transfer-printed sherds (727.001, 767.003, and 782.003) from the rim of a saucer likely date to the early 20th century.

Sponge or spatter decorated ceramics (Figure 3.37) made up 9 percent of the decorated ceramic assemblage.[2] These include a variety of ware types. Multiple sherds from a blue and brown spatterware bowl (729.010, 757.004, 826.003, 829.001, and 942.002) with a molded floral were recovered. This vessel also had flecks of liquid gold decoration. It resembles some Rockingham wares, but probably dates to the 1920s or later. The deep Trench E assemblage also included sherds from a different yellow ware sponge decorated bowl (826.014 and 955.002). Multiple sherds of refined earthenware with a cream-colored glaze and light blue sponge-decorated motif (757.005, 767.006, and 831.002) were part of a pottery crock made by the Robinson-Ransbottom pottery of Roseville, Ohio. This pottery was founded in 1900 and was the largest producer of stoneware crocks in American by 1916.

Six different decorative methods each made up 3 percent or less of the ceramic assemblage (Figure 3.38). Eight sherds from a copper luster hand-painted platter with a tea leaf motif in the center (698.001, 767.004, 782.001, and 913.002) were present. One of these sherds, a small portion of a rim, was recovered from the shallow portion of Trench E. This plate had a maker's mark from the Alfred Meakin Pottery of Staffordshire, UK . This mark was used from 1891-1897 (Kowalsky and Kowalsky 1999). Seven sherds (740.001, 744.001, 831.004, and 843.001) from a whiteware bowl had a variegated pattern that included pink, black, blue and yellow colors. The dates for this ceramic are unknown. Three sherds of a hand-painted vessel (706.001, 708.001, and 729.012)

2 This percentage only includes refined earthenwares, porcellaneous wares, and coarse earthenwares and therefore does not include the stoneware sponge-decorated sherd.

Figure 3.34. *Molded ceramics from the deep contexts in Trench E: (a) ironstone lid (725.001), (b) whiteware refitted handle (729.016 and 757.006), (c) porcellaneous ware vase base (733.001 and 896.001), (d) ironstone rim (754.001), (e) scalloped whiteware bowl rim with floral swag motif (826.001), (f) ironstone (826.005 and 968.001), (g) whiteware with acanthus leaf motif (826.004), (h) matte art glaze vase with floral motif (875.001).*

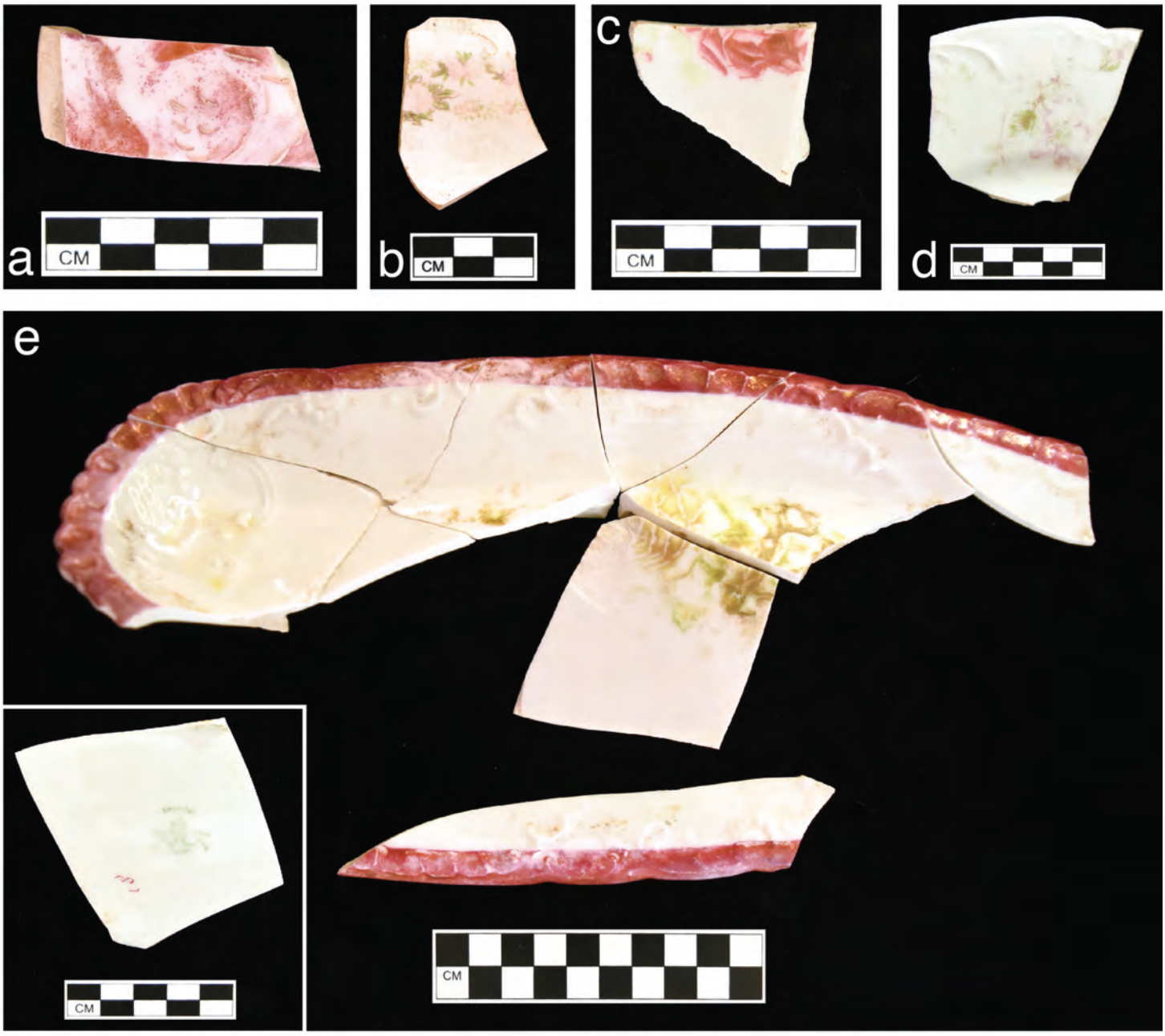


Figure 3.35. *Ceramics decorated with overglaze decals from the deep contexts in Trench E: (a) porcellaneous ware vessel base with red rose motif (721.001), (b) molded whiteware bowl rim with faded pink roses (782.010), (c) porcellaneous ware with rose (826.013), (d) molded porcellaneous ware plate rim (849.001), and (3) oblong molded porcellaneous ware with faded floral decals, red overglaze hand-painted rim with inset at lower left showing Imperial Crown China Austria mark, 1884-1914 (742.001).*

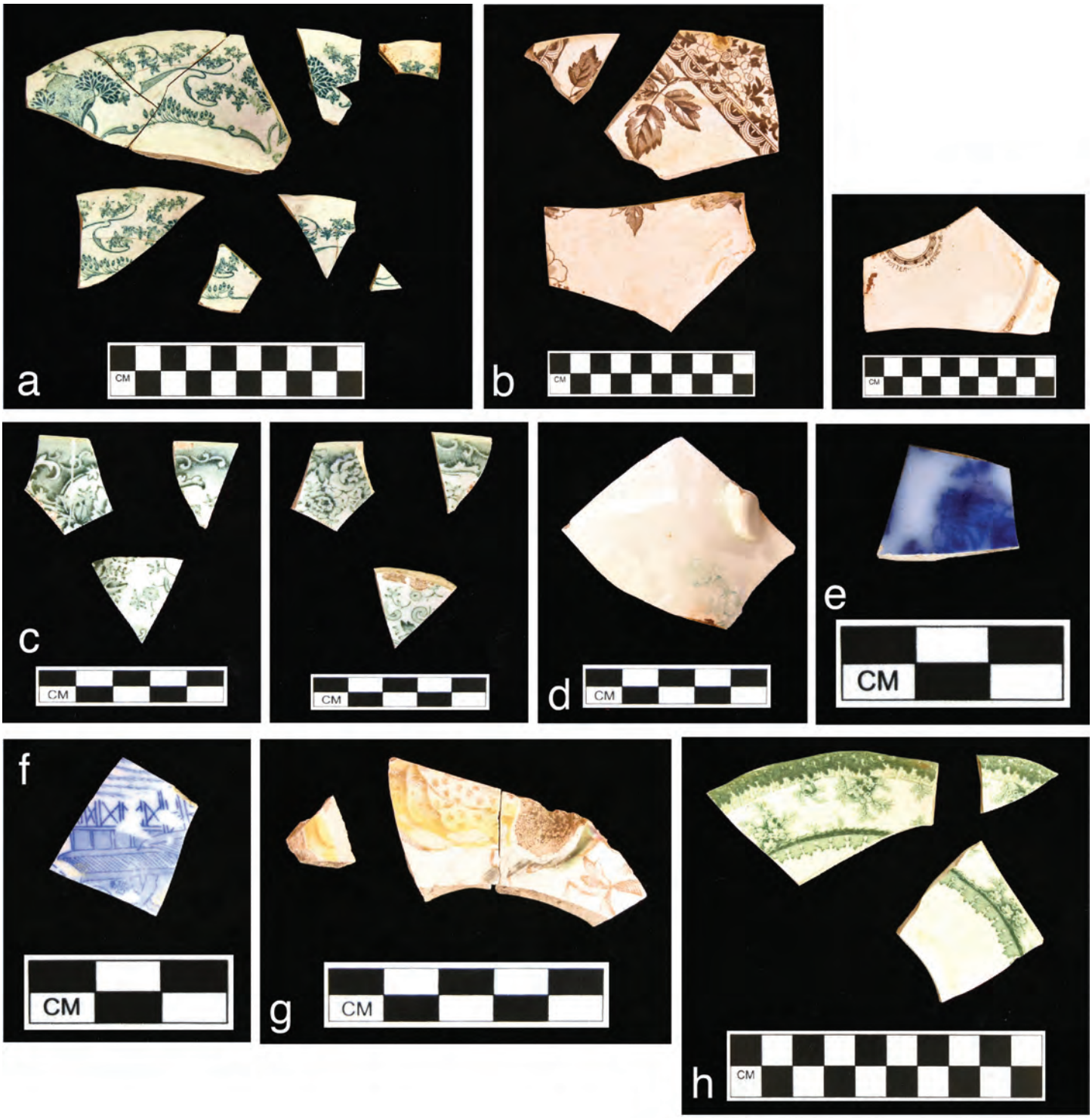


Figure 3.36. *Transfer-printed ceramics from the deep contexts in Trench E: (a) teal transfer-printed whiteware saucer rim (727.001, 767.003, and 782.003), (b) brown aesthetic transfer-printed whiteware plate with J. R. Wileman at Foley Studios maker's mark in the Victoria or Albert pattern (732.001, 767.002, 782.002), (c) Green transfer-printed whiteware teacup rims with designs on the interior and exterior (752.001, 755.001, and 756.001), (d) green transfer-printed handled whiteware vessel (757.012), (e) flow blue transfer-printed whiteware (826.001), (f) medium blue transfer-printed porcellaneous ware (826.007), (g) brown transfer-printed whiteware with yellow and green clobbering (832.001), (h) green transfer-printed whiteware plate rim (861.001 and 863.001).*

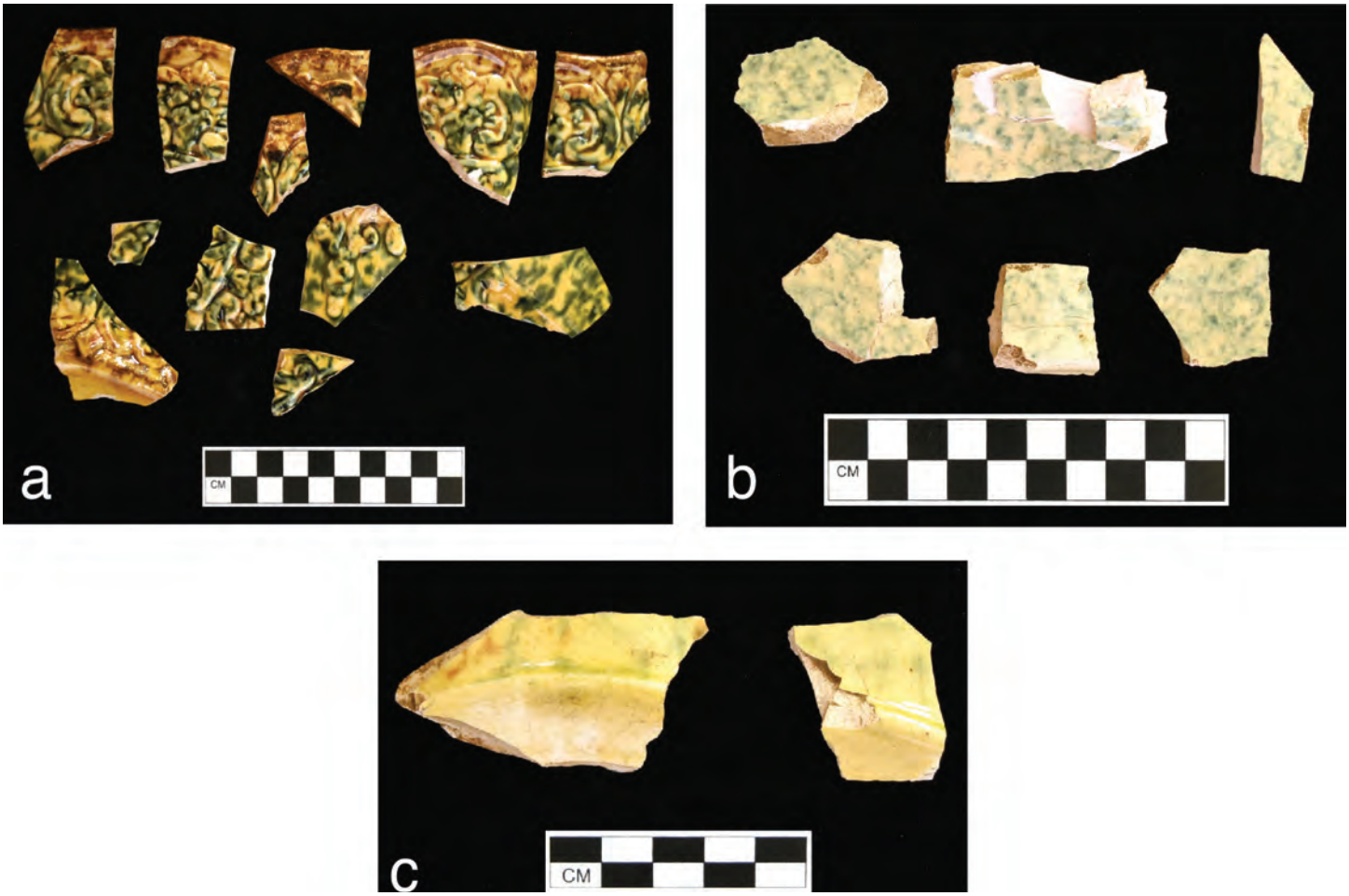


Figure 3.37. *Sponge or spatter-decorated ceramics from the deep contexts in Trench E: (a) dark blue and brown spattered molded yellow ware vessel with added gilding (729.010, 757.004, 826.003, 829.001, and 942.001), (b) refined earthenware with cream-colored glaze and light blue sponge decoration (757.005, 767.006, and 831.002), (c) brown and light blue spattered yellow ware vessel base (826.014 and 985.002).*

with orange, yellow, green, and blue floral motifs came from both the deep and shallow contexts. Six sherds of overglaze printed porcelain (727.002, 767.001, and 876.001) had orange and red Japanese Geisha Girl motifs. These wares were first made in 1875 and were imported into the United States until at least 1950 (Litts 1988).

Nineteen sherds, all from the deeper contexts in the trench, had maker's marks; nine, three of which were discussed above, were identifiable (Figure 3.39). Three of the identified marks are from the Homer Laughlin China Company, originally founded in East Liverpool, Ohio. The mark with the eagle (729.013) was used between 1877-1900. The second sherd (751.002), with a mark that reads "Homer Laughlin Semi-Vitreous China An American Beauty" was introduced by the company in 1898 and made until 1910. The third (835.001) is a small portion of a mark with a laurel wreath and "OCT 31ST 99," meaning this sherd must date after 1899 (Kowalsky and Kowalsky 1999). An ironstone sherd (913.005) also made in America had a mark used from 1893-1903 by the The Wheeling Pottery of Wheeling, West Virginia. Another ironstone sherd (997.001) was marked with an impressed "HOTEL," which has not been identified. Two sherds (729.015 and 831.001) had portions of maker's marks used between 1914 and 1925 by the W. H. Grindley Company of England. Another sherd (757.007) had an English mark from Royalstone China Wedgwood & Company that dates after 1891 (Kowalsky and Kowalsky 1999). A sherd of porcellaneous ware (757.008) had a mark that read "Royal Austria" with "O E & G" above it. This mark was used by Oscar and Edgar Gutherz porcelain between 1897 and 1918 (Henderson 2007).

Five ceramic tile fragments were recovered from the deep excavations in Trench E (Figure 3.40). Three pieces (757.009, 977.001, and 985.001) were from a rectangular green and gold spatterware tile with a white

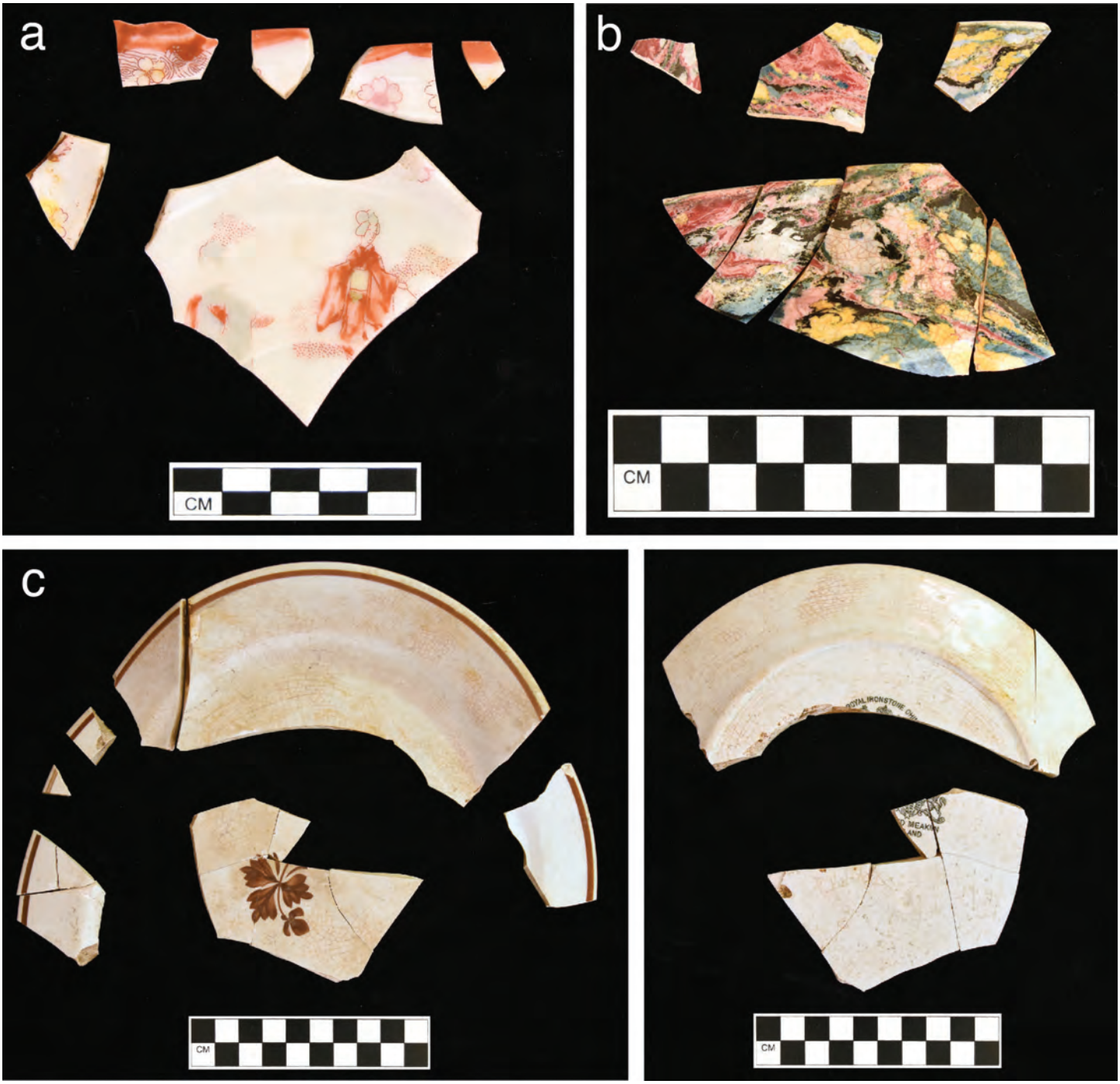


Figure 3.38. *Hand-painted ceramics from the deep contexts in Trench E: (a) porcelain Geisha girl plate (727.002, 767.001, and 867.001), (b) Pink, yellow, blue, and black variegated whiteware bowl (740.001, 744.001, 831.004, and 843.001), and (c) tea leaf hand-painted copper luster ironstone platter with Alfred Meakin and Company maker's mark (698.001, 767.004, 782.001, and 913.002).*

Figure 3.39. *Maker's marks from the deep contexts in Trench E: (a) Homer Laughlin Semi-Vitreous China; An American Beauty mark, 1898-1910 (737.001 and 753.001), (b) Royalstone China Wedgwood & Co. England, 1891+ (757.007), (c) Oscar and Edgar Gutherz mark, 1899-1918 (757.008), (d) unidentified mark (771.003), (e) portion of possible "FRANCE" mark (761.001), (f) W. H. Grindley Co. England, 1914-1925 (831.001), (g) unidentified mark (831.003), (h) unidentified OCT 31, 99 mark (835.001), (i) The Wheeling Pottery, White Granite mark, 1893-1903 (913.005), (j) impressed "...OTEL" mark (997.001).*

background. This is likely a decorative tile from a fireplace surround. A similar shaped fireplace tile in a different color was recovered from the 2021 Trench A excavations. Both tiles dates to the late 19th or early 20th century.

Glass

Glass colors. The glass assemblages from Trench E consists of 2,806 pieces of glass. About 18 percent (n=501) are from the shallow excavations and 73 percent (n=2093) are from the deep excavations; the remaining nine percent are from contexts without provenience. Table 3.17 shows the colors of 2,437 shards of container glass from the shallow and deep contexts. This table does not include flat glass, insulators, or light fixture/bulb glass. The only glass retained from these categories, seen in Figure 3.41, were fragments of a red glass automobile taillight (714.001) made by the Jefferson Glass Company, a glass marble, and two pieces of blue stained glass (767.011). The taillight, which was from the shallow context, was made sometime in the early 20th century. The marble (694.008) is a 5/8" white marble with an orange swirl from the early 20th century recovered from the shallow context. The stained glass, which is from the deeper context, is not dated.

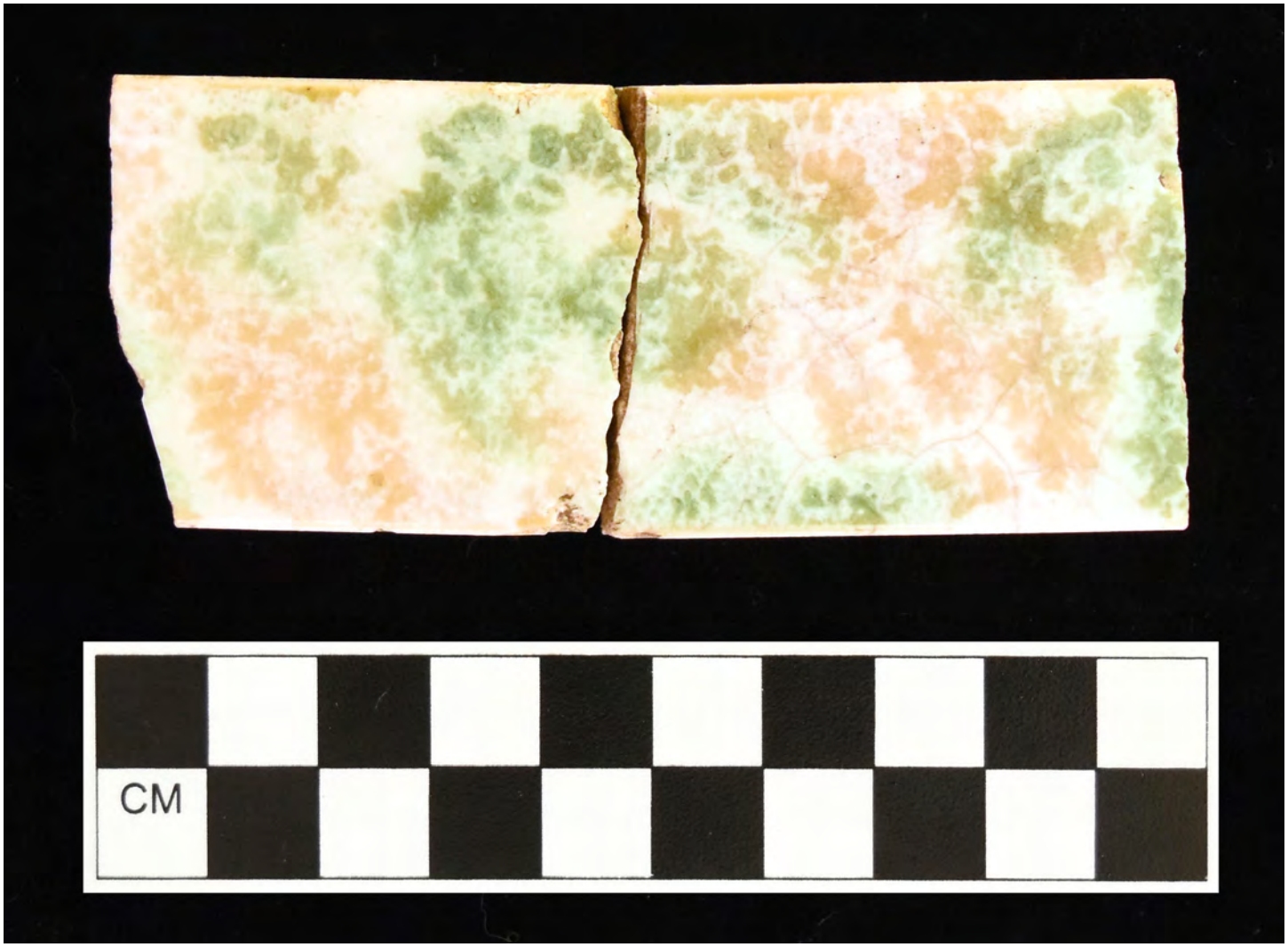


Figure 3.40. *Yellow and green spatterware decorative ceramic tile recovered from the deep Trench E contexts (757.009 and 977.001).*

Glass color is not especially useful in assigning dates to the Trench E assemblages. Colorless glass was most common from the shallow trench (45 percent), followed by aqua glass (30 percent). The shallow trench glass included several early 20th century glass colors, including bright green, peach, and straw-tinted glass. Colorless glass also made up the largest share of the glass (40 percent) from the deep contexts. The deep glass also the three

Table 3.18. Glass colors recovered from the shallow and deep contexts in Trench E.

Glass Color	Trench E Shallow		Trench E Deep		Trench E Total	
	Count	%	Count	%	Count	%
Amber/Brown/Black Amber	20	4.7	196	11.1	232	9.5
Aqua/Light Aqua	129	30.4	348	19.7	505	20.7
Bright (7-Up Green)	3	0.7	2	0.1	7	0.3
Cobalt/Sapphire Blue	9	2.1	3	0.2	10	0.4
Colorless	192	45.2	684	38.8	1037	42.6
Dark Olive/Olive Green/Olive Amber	6	1.4	21	1.2	29	1.2
Deep Blue/Deep Green Aqua	19	4.5	192	10.9	240	9.8
Manganese (Light Amethyst)	14	3.3	173	9.8	194	8.0
Citron	0	0.0	9	0.5	9	0.4
Light Yellow (Straw)/Yellow	2	0.5	1	0.1	3	0.1
Peach	18	4.2	5	0.3	23	0.9
Milk Glass	13	3.1	131	7.4	148	6.1
Total	**425**	**17.4**	**1765**	**72.4**	**2437**	**100.0**

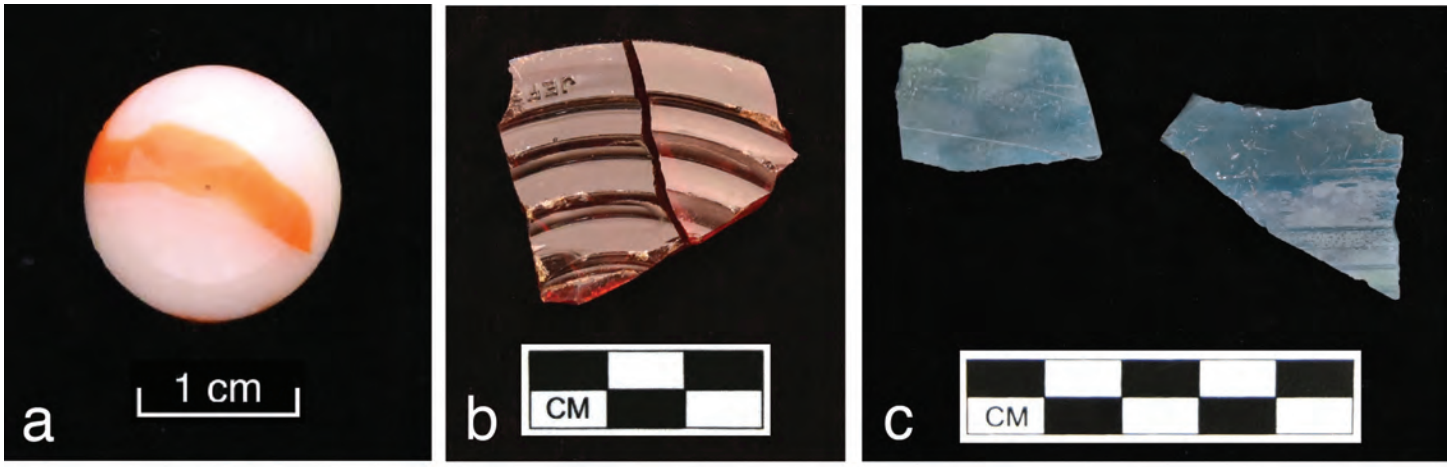


Figure 3.41. *Non-container glass retained from Trench E: (a) white and orange marble (694.008), (b) red automobile tail light lens made by the Jefferson Glass Company (714.001), (c) blue stained glass (767.011).*

included 20th century colors. Manganese glass made up a larger share (10 percent) of the deeper glass; only three percent of the glass from the shallow contexts was manganese.

Jars. Table 3.19 provides the breakdown of the 416 identified container types from both contexts in Trench E. Roughly one quarter (n=19) of the shallow assemblage was composed of jars, with canning jars (n=9) making up about half of that assemblage. Canning jars (n=30) made up the same percentage of the deep trench jars. One of the canning jars (696.001) from the shallow trench, has a portion of the scrollwork logo for a Woodbury Improved canning jar (Creswick 1987) made by Woodbury Glass Works in New Jersey between 1886 and 1892 (Figure 3.42). An early canning jar base (729.001) made in post-bottom mold was recovered from the Trench E back dirt pile. Milk glass canning jar lid liners made up a greater portion of bottles from the deep contexts at 9 percent than the shallow contexts, at 5 percent.

Table 3.19. Glass container counts from the shallow and deep contexts in Trench E.

Broad Type	Container Type	Trench E shallow		Trench E deep		Trench E Total	
		Count	%	Count	%	Count	%
Jars	Canning Jar	9	47.4	30	51.7	42	53.2
	Cosmetic/Medicine Jar	1	5.3	4	6.9	5	6.3
	Unidentified Jar	2	10.5	14	24.1	17	21.5
	Commercial Food Jar	3	15.8	2	3.4	4	0.0
	Large jar	3	15.8	3	5.2	6	7.6
	Canning Jar Lid Liner	1	5.3	5	8.6	5	6.3
	Total	19	25.7	58	18.1	79	19.0
Bottles	Condiment Bottle	2	5.1	20	9.4	23	8.3
	Liquor Bottle	4	10.3	19	9.0	24	8.7
	Wine bottle	1	2.6	0	0.0	1	0.4
	Soda/Beer Bottle	7	17.9	25	11.8	37	13.4
	Medicine/Extract Bottle	11	28.2	64	30.2	83	30.1
	Ink/Polish Bottle	0	0.0	5	2.4	5	1.8
	Oil bottle	0	0.0	1	0.5	1	0.0
	Poison/Disinfectant bottle	0	0.0	1	0.5	1	0.0
	Perfume/Toiletry bottle	0	0.0	0	0.0	1	0.4
	Stopper	0	0.0	4	1.9	4	1.4
	Unidentified bottle	14	35.9	73	34.4	96	34.8
	Total	39	52.7	212	66.3	276	66.3
Tablewares	Vase	5	31.3	4	8.2	5	8.3
	Tumbler/Snuff jar	4	25.0	16	32.7	22	36.7
	Lid	0	0.0	2	4.1	2	3.3
	Bowl	0	0.0	2	4.1	2	3.3
	Unidentified Tableware	7	43.8	25	51.0	29	48.3
	Total	16	21.6	49	15.3	60	14.4
Kerosene lamp		0	0.0	1	0.3	1	0.2
Total for Identified Containers		**74**	**17.8**	**320**	**76.9**	**416**	**100.0**

Unidentified jars make up about 30 percent of both assemblages. Commercial food jars were infrequent, making up 16 percent of the shallow assemblage and four percent of the deep assemblage. Several early 20th century jars from the Beech Nut Corporation, discussed above, were reburied because they were less complete specimens. A MacLaren's Imperial Cheese jar from the shallow context was also reburied, since a more complete jar (34TU219.172) was recovered during the 2020 Sexton Area excavations. That jar dates between 1891 and 1920. Five medicine jars were recovered; one was from the shallow context and four were from the deep (Figure 3.43). A cross-mended milk glass jar from the deep context (767.017 and 782.004) contained "Mentholatum,"

a menthol-based ointment for muscle pain made by a company founded by Albert Alexander Hide in Wichita, KS in 1889. The brand was purchased by a Japanese corporation in the 1990s and the product is still made today. A second milk glass jar (740.003) held a topical analgesic called "Resinol." This product, which was developed in Baltimore and mass-produced starting in 1895 is also still available today. The other jar of note is the base of a colorless octagonal jar (782.007) that held an unknown product.

***Figure 3.42**. Portion of a Woodbury Improved canning jar from the shallow context in Trench E made by the Woodbury Glassworks in New Jersey, 1886-1892.*

Manufacture methods. Table 3.20 provides the frequencies of manufacturing methods from 163 documented jars and bottles. Of those containers, 141 can be assigned to shallow or deep contexts. There are substantial temporal distinctions in production methods from the shallow and deep contexts. About 2/3 of the containers in the shallow context were made on some sort of machine. Roughly a quarter of the containers from the shallow context were mold-blown. The proportions from the deeper contexts were nearly reversed, with 2/3 of bottles blown into molds and the remaining third made with some type of automated machine. The identified bottle finish methods, found in Table 3.21, are not as different as the finish methods. Tooled finishes make up 56 percent of the shallow containers and 67 percent of the deep containers. The manufacturing methods of the glass from the shallower contexts indicate that these deposits are more recent than the deeper artifacts, which include more vessels from the late 19th and early 20th century.

Bottles. The majority of the identified containers were bottles. About a third of the 276 bottles were unidentified. Twenty-five bottles from the shallow context and 149 bottles from the deep context were identified.

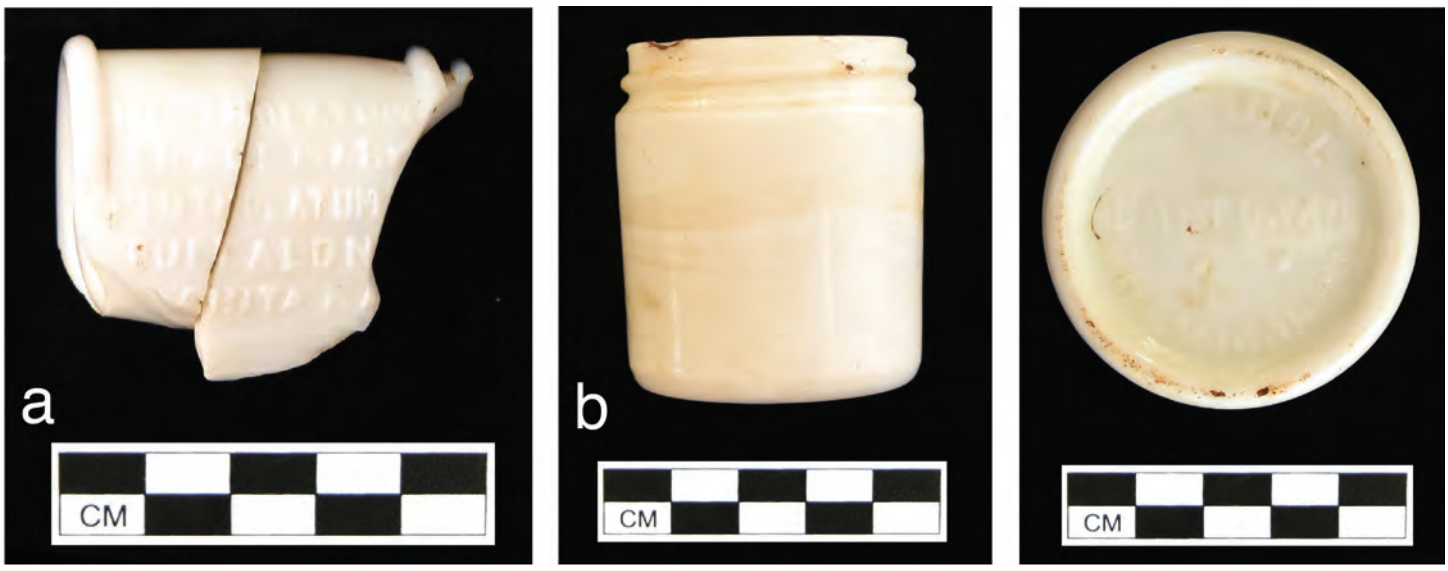


***Figure 3.43.** Milk glass medicine jars from recovered from Trench E deep contexts: (a) Metholatum muscle ointment jar made in Wichita Kansas after 1889 (767.017 and 782.004); (b) complete Resinol jar made by Dr. Melville Harmon Carter after 1906 (740.003).*

Table 3.20. Glass bottle and jar manufacture methods from the shallow and deep contexts in Trench E.

Manufacture Method	Date Range	Trench E Shallow		Trench E Deep		Trench E Total	
		Count	%	Count	%	Count	%
Cup-Base Mold	1880-1920	4	13.3	58	52.3	67	41.1
Machine Made	1908+	14	46.7	21	18.9	38	23.3
Owens Machine	1905-1930	5	16.7	7	6.3	21	12.9
Post-Bottom Mold	1840-1905	4	13.3	14	12.6	21	12.9
Press-and-Blow Machine	1905-1930	2	6.7	8	7.2	12	7.4
Turn Mold	1880-1915	1	3.3	3	2.7	4	2.5
Total		**30**	**18.4**	**111**	**68.1**	**163**	**100**

Table 3.21. Glass bottle finish methods from the shallow and deep contexts in Trench E.

Finish Method	Date Range	Trench E Shallow		Trench E Deep		Trench E	
		Count	%	Count	%	Count	%
Tooled	1870-1930	10	55.6	57	66.3	73	64.6
Machine Made	1910+	8	44.4	29	33.7	40	35.4
Total		18	15.9	86	76.1	113	100

Medicine/extract bottles were the most common identified bottle type, making up 30% of the bottles from both contexts (Figure 3.44). Eight of the medicine bottles, which were recovered from deep and shallow contexts, contained Dr. Samuel Brubaker Hartman's "Peruna" bottle a patent medicine made up of liquor and water created in 1877 for cure of "catarrh," a mysterious mechanism that caused disease all over the bottle. Peruna was incredibly popular in the late 19th century and became one of the inspirations for the 1906 Pure Food and Drug Act (Sullivan 2007). Bottles from the deeper contexts were from a variety of patent medicines sold in large quantities during the late 19th and early 20th century. These medicines, which were inevitably made up primarily of alcohol, include: Dr. McLean's Strengthening Cordial and Blood purified (755.002), developed by James Henry McLean out of St. Louis in 1863 (Nickell 2013); Billy Baxter's Red Raven Splits (806.001), a hangover cure made of bitter aperiant water sold in bars starting in the 1890s (Griffin 2015); Herbine (820.002), advertised to treat a lazy liver and made by James Ballard of St. Louis; Dr. Pierce's Favorite Prescription (831.005), a patent medicine marketed to women that was supposed to cure nervine issues that caused reproductive problems (Nickell 2015), Ballard Snow Liniment Co. (832.003), also made by James Ballard of St. Louis after 1885, and a bottle marked "BUFFALO" (835.002) also made by R.V. Pierce.

An embossed bottle (835.003) from the deep contexts contained tea or coffee extracts. This bottle was made by the Union Pacific and Tea Company, which was founded in New York City in 1873. The company imported and sold tea and coffee into the early 20th century. Three medicine bottles had makers marks on the base. A Philadelphia oval shaped medicine bottle (757.017) had the "M" in a diamond mark of John M. Maris Company, Philadelphia was made between 1875-1889 (Lockhart et al. 2018c). A complete medium amber (754.003) Excelsior shaped medicine bottle had a mark from the Parke Davis Glass Company out of Detroit, which dates the bottle between 1880 and 1910 (Lockhart et al. 2018d). A colorless Erie oval-shaped medicine bottle is marked "Pearl" on the base (740.002). This bottle likely was likely made by the Sheldon-Foster Glass

Figure 3.44. *Medicine bottles from Trench E: (a,b) Dr. Samuel Brubaker Hartman's "Peruna" base (767.015) and finish (700.004), 1877-1910; (c) Dr. McLean's Strengthening Cordial and Blood purifier, 1870-1906 (755.002); (d) Dr. Pierce's Favorite Prescription, late 19th/early 20th c. (831.005); (e) bottle marked "BUFFALO" (835.002) also R.V. Pierce, late 19th/early 20th c. (831.005), (f) Ballard Snow Liniment, 1885+ (832.003); (g) Red Raven Splits hangover cure, 1890-1938 (806.001); (h) Union Pacific and Tea Company extract bottle, 1873+ (835.003); (i) Philadelphia oval-shaped bottle by John M. Maris Company, 1875-1889 (757.017); (j) Rectangular bottle with Park David Glass company mark; (k) Erie oval-shaped bottle with "Pearl" mark by Sheldon-Foster Glass Co., 1900-1911 (740.002); (l) Herbine bottle, 1882+ (820.002).*

Co. of Chicago-Heights, Illinois between 1900 and 1911 (Lockhart et al. 2019a).

Soda/beer bottles made up 18 percent of the deep bottles and 12 percent of the deep bottles (Figure 3.45). Two soda bottles were from the mid-20th century. The first was a shallow bottle is a hobble skirt-shaped Coca-Cola Bottle (694.011) made in the 1950s by the Chattanooga Bottling Company. The second, which was recovered from the back dirt was a Dr. Pepper bottle (729.007) with the "Good for Life" 10 and 2 clock embossing. This bottle dates sometime after 1940. These bottles were made until 1996, but it is likely this bottle is from the mid-20th century. A soda bottle (696.002) from the shallow context had a mark from the Sand Springs Bottling Company, which supplied water to the city of Tulsa in the first decades of the 20th century. Two soda bottles from the deep context were complete bottles marked "Southwestern Bottling Company, Tulsa, I.T. One was a Hutchinson-style bottle (822.001) made after 1880 with a blob-style finish that would have had a stopper closure. The other was a soda bottle with a crown finish that would have had a metal crown cap closure (822.002). The Indian Territory mark means these bottles were made before Oklahoma achieved statehood in 1906. Several bottles had "AB" ligature American Bottling Company (755.002 and 782.005) marks and one bottle (753.003) had a mark from the Streator Bottle Glass Company between 1890 and 1905 (Lockhart et al. 2019b).

Four beer bottles had identifying marks on their bases and bodies. These include the base of a post-bottom mold made bottle (729.004) from William Franzen and Company of Milwaukee between 1898 and 1920, the base of a cup-bottom mold made bottle (729.005) from the Interstate Glass Company of Kansas City, Missouri between 1901 and 1903, and a post-bottom mold made base (771.006) from the Edward H. Everett Company of New Jersey between 1885 and 1904 (Lockhart et al. 2015). A colorless embossed glass bottle (826.010) has the script logo of Heim Brewing, which was founded in Kansas City in 1884 (Wells 2022). The brewery rebranded into the Kansas City Breweries Company in 1905, which shuttered when Prohibition went into effect in 1918.

Liquor bottles made up 10 percent of the shallow assemblage and 9 percent of the deep assemblage. Most of these bottles were flask-style bottles with pedestal bases, which date between roughly 1890 and 1920. Only one bottle (734.002) was retained for curation, the base of a flask with an unidentified "F" mark (Figure 3.46).

Condiment bottles made up 10 percent of the deep assemblage and only five percent of the shallow assemblage (Figure 3.47). One complete bottle (695.001) from the shallow context has a mark used by the Obear-Nestor Glass Company between 1894 and 1925. The base of a machine-made ketchup or other sauce bottle (732.004) from the deep context was made by the Swindell Company glassmakers was made between 1910 and 1945. A probable olive bottle with ribbing around the base (767.014) made with an Owens machine mark dates after 1906. Another similar machine-made bottle (822.004) also was recovered from the deep contexts. Two ketchup bottles with embossed medallions (771.005 and 822.003) made by the Curtice Brothers Preservers Company of Rochester, New York were recovered. One is colorless and the other is light amethyst. They date between 1890 and 1918.

Household bottles, including ink, oil, and poison bottles were absent from the shallow assemblage and accounted for less than four percent of the deep assemblage (Figure 3.48). A complete bottle (757.019) held George Cole 3-in-1 oil, a product introduced in 1894 that is still made today. This bottle was made in a cup-bottom mold and dates between 1894 and 1920. Two complete ink bottles made by Sanford Ink (728.001) after 1898 and by Bankers Ink (1096.002), a company from Kansas City that operated from 1902 into the 1930s (Antique Bottle Stories 2021). A third partial ink bottle (876.002) was made by the Diamond Ink Company of Milwaukee after 1903.

Tableware. Tablewares consisting of pattern and press molded glass, made up 22 percent of the shallow assemblage and 15 percent of the deep assemblage. Several of the tableware vessels from the shallow context likely were placed on graves (Figure 3.49). One of these was a bowl (705.001) with patterned squares which is likely Pattern 124, made by the Westmoreland Group of Grapeville, Pennsylvania after 1924. Shards were

Figure 3.45. *Soda and beer bottles from Trench E: (a) hobble skirt-shaped Coca-Cola bottle made by the Chattanooga Bottling Company, 1950s (694.011); (b) Dr. Pepper, 1940s+ (729.007), (c) American Bottling Company, 1906-1909 (755.002); (d) Sand Springs Bottling Company, 1907+ (696.002); (e) Tulsa Bottling Works, 1895-1906 (695.002); Southwestern Bottling Company, Tulsa, I.T.: (f) Hutchinson style, 1880-1906 (822.001), (g) crown finish, 1895-1906 (822.002); (h) post-bottom mold by William Franzen and Company, 1898-1920 (729.004); (i) Interstate Glass Company, 1901-1903 (729.005); (j) post-bottom mold by Everett H. Edward Company, 1885-1904 (771.006); (k) Heim Brewing, 1884-1905 (826.010).*

Figure 3.46. *Base of a colorless dandy or eagle-shaped brandy flask (734.005) recovered from the deep context of Trench E.*

recovered from two pieces of carnival glass with an iridescent gold finish. One (714.002) was exclusively in the shallow context, while fragments of the other vessel came from both the shallow and deep trenches (714.003, 737.002, and 753.002). Numerous fragments from a pressed milk glass vase (717.003, 845.001, and 913.007) were also recovered in shallow and deep contexts. Another milk glass vase (913.001), with a matte finish, was recovered from the deep contexts.

Tableware from the deep contexts can also be dated (Figure 3.50). Two different colorless vessels in the Kokomo Glass Company Pattern 600, a bowl (757.014, 819.001, and 821.001) and tumbler (729.002 and 826.009), were introduced in 1905 and made in Kokomo, Indiana. Numerous fragments of a deep blue aqua tumbler (727.003, 729.018, 767.013, 782.009, 822.004) were recovered from the deep contexts. That tumbler dates to the early 20th century. The rim of a bowl with a triangle pattern (913.006) is from the Fandango pattern made by A.H. Heisey and Company of Newark, Ohio between 1898 and 1918. Several of the recovered tumblers were initially sold containing food. One of these (767.012), a tumbler with a horseshoe with stars on the base was retained. Tumblers with this pattern, which were originally sold containing products like cheese, mustard, or potted meat, were made by a number of glass-making companies starting in 1895. Two pieces of glass from the base of a kerosene lamp (753.005 and 942.004) were made by the United States Glass Company starting in 1890.

The glass analysis demonstrates that the shallow Trench E context is later in time than the deeper contexts. Many of the later glass artifacts were found were associated with the graves, but some date to the same time frame as many of the Trench A – D artifacts, 1890 to 1910. The deeper assemblage also dates to this period.

Figure 3.47. *Condiment bottles from Trench E: (a) Square cup-based mold made with Obear-Nestor Glass Company mark, 1895-1910 (695.001); (b) Machine-made base, "THE T.A. SNIDER PRESERVE CO. CINCINNATTI, OH," likely by Swindell Brothers Glass company, 1910-1945 (732.004); (c) Machine-made manganese ketchup bottle with Curtice Brothers Co. Preservers, Rochester, NY mark, 1910-1918 (822.003); (d) Owens machine made olive bottle with illegible mark (767.014).*

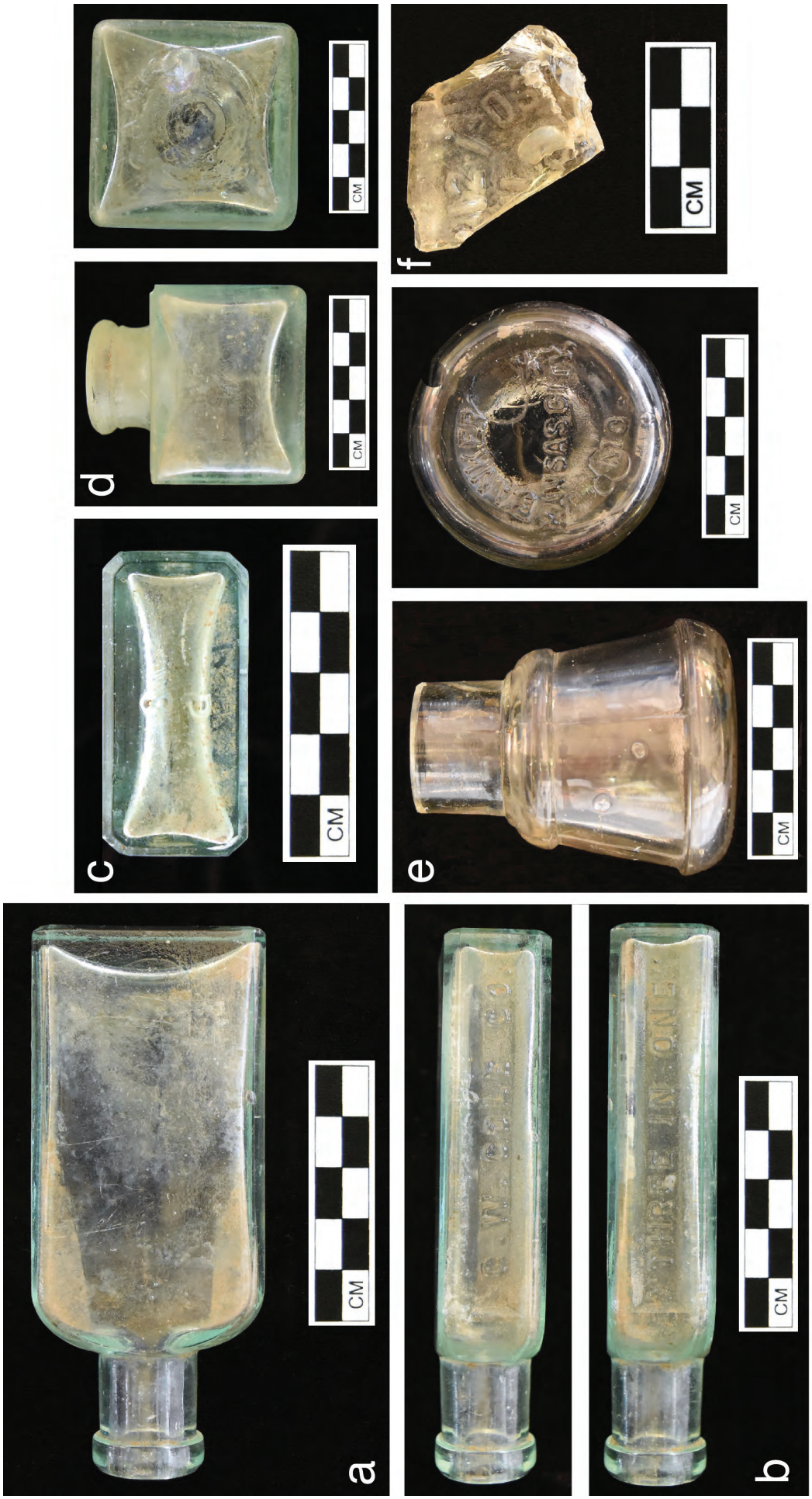


Figure 3.48. *Household bottles from Trench E: (a-c) complete cup-base mold made George Cole 3-in-1 oil, 1894-1920 (757.019); (d) Complete square Sanford Ink made on a press-and-blow machine, 1898+ (728.001); (e) machine-made Bankers Ink bottle, 1902-1939 (1096.002); (f) Diamond Ink Company, 1903+ (876.002).*

Figure 3.49. *Press molded glass from the shallow context of Trench E: unknown patterns: (a) body, 694.012, (b) base, 699.002, (c) base, 708.004, (d) Early American Pattern Glass bowl in pattern 124 by Westmoreland Group, 1924+ (705.001), (e) iridescent carnival glass vase base (714.002).*

Figure 3.50. *Press molded glass from the deep context of Trench E: (a) carnival glass vase with fluted body (714.003, 737.002, and 753.002); (b) floral milk glass vase (717.003, 845.001, and 913.007); (c) deep blue aqua tumbler with starburst base (727.003, 729.018, 767.013, 782.009, and 822.004); (d) Kokomo Pattern 600 tumbler by Kokomo Glass Company, 1905 (729.002 and 826.009); (e) unidentified pattern (753.004, 754.002, and 762.001); (f) US Glass Company lamp base (753.005 and 942.003), 1890+; (g) unidentified vase base (782.006); (h) unidentified pattern (757.015); (i) large vase, unidentified pattern (757.016, 828.001, and 832.003); (j) unidentified pattern rim (913.006); (k) unidentified pattern (804.001); (l) Kokomo Pattern 600 vessel, 1905 (757.014, 819.001, and 821.001); (m) manganese machine-made glass food tumbler, 1906-1918 (767.012); (n) milk glass, unidentified pattern (771.004).*

Metal

Metal made up 42 percent of the Trench E artifact assemblage. Table 3.22 shows the metal artifacts from the shallow and deep contexts by type. Nearly 90 percent of the metal was recovered from the deep contexts. Most of the recovered metal artifacts fell into three categories, unidentified ferrous metal, wire nails, and flat ferrous metal. These artifacts made up 74 percent of the metal from the shallow contexts and 96 percent of the artifacts from the shallow contexts. These quantities are influenced by the recovery methods. First, monitors avoided collecting unidentified ferrous metal fragments during the backhoe excavations. Second, artifacts recovered from screened grave shafts and coffin fill were included in the analysis. This led to higher recovery of wire coffin nails and flat ferrous metal fragments, particularly from the deep context. Those artifacts were then bagged for reburial in individual shafts.

Table 3.22. Metal artifacts from the shallow and deep contexts in Trench E.

Artifact Category	Trench E Shallow		Trench E Deep		Trench E Total	
	Count	Percent	Count	Percent	Count	Percent
Unidentified Ferrous Metal	22	16.7	686	27.1	718	25.6
Cut Nails	0	0.0	1	0.0	1	0.0
Wire Nails	38	28.8	1239	49.0	1326	47.3
Other hardware	7	5.3	30	1.2	47	1.7
Hasp/Hinge/Lockplates	0	0.0	2	0.1	3	0.1
Unidentified flat ferrous metal	35	26.5	491	19.4	543	19.4
Scissors	1	0.8	0	0.0	1	0.0
Railroad spikes	7	5.3	16	0.6	26	0.9
Ferrous metal rods	2	1.5	2	0.1	5	0.2
Cans/lids	14	10.6	2	0.1	68	2.4
Wire (Barbed/Baling)	4	3.0	30	1.2	32	1.1
Metal straps	1	0.8	1	0.0	2	0.1
Unidentified Cuprous Metal	1	0.8	5	0.2	5	0.2
Ammunition	0	0.0	4	0.2	4	0.1
Cuprous clothing hardware	0	0.0	5	0.2	5	0.2
Horseshoe/Mule shoe	0	0.0	1	0.0	4	0.1
Crown bottle cap	0	0.0	4	0.2	4	0.1
Cutlery	0	0.0	2	0.1	2	0.1
Buckle	0	0.0	1	0.0	1	0.0
Window Weight	0	0.0	1	0.0	1	0.0
US Penny	0	0.0	1	0.0	1	0.0
Handle fragments	0	0.0	2	0.1	2	0.1
Makeup Compact	0	0.0	1	0.0	1	0.0
Furniture parts	0	0.0	1	0.0	4	0.1
Total	**132**	**4.7**	**2528**	**90.1**	**2806**	**100.0**

Only three metal artifacts from the shallow contexts were retained (Figure 3.51). Aside from the three majority categories listed above, the most common categories of artifacts were ferrous metal can fragments (11 percent), railroad spikes (5 percent), and hardware (5 percent). The retained artifacts include a 6" long square ferrous metal spike (694.014), a flat cuprous metal ring (694.015), and pair of ferrous metal scissors (708.005). None of these artifacts are considered temporally diagnostic.

A much greater variety of metal artifacts were recovered from the deep contexts (Figure 3.52). Hardware, wire fragments, and railroad spikes were the most frequent artifacts after the three artifact categories discussed above. Two furniture fragments, including a ferrous metal caster (767.020) and a white metal oval drawer pull (1075.001) from the late 19th/early 20th century were recovered. Three pieces from ammunition rounds were recovered, including a small piece of lead bird shot (760.004), an unmarked 12 gauge shotgun shell (782.008), and a shell casing from a 45-70 rifle round marked "UMC SH" (757.001). This is a "Solid Head" (SH) round made by the Union Metallic Cartridge Company, which began marking rounds "SH" in 1887. Several clothing pieces and personal items were recovered, including a cuprous button (876.004), a cuprous tie clip (734.001), and a red enameled makeup compact (745.001). The compact, which still opens, has remnants of face powder and a broken mirror inside; it was likely made in the early 20th century. A single United States copper penny (767.021) was unfortunately too corroded to date. One of the more curious artifacts was a metal paint can with dried red paint (782.009) still inside.

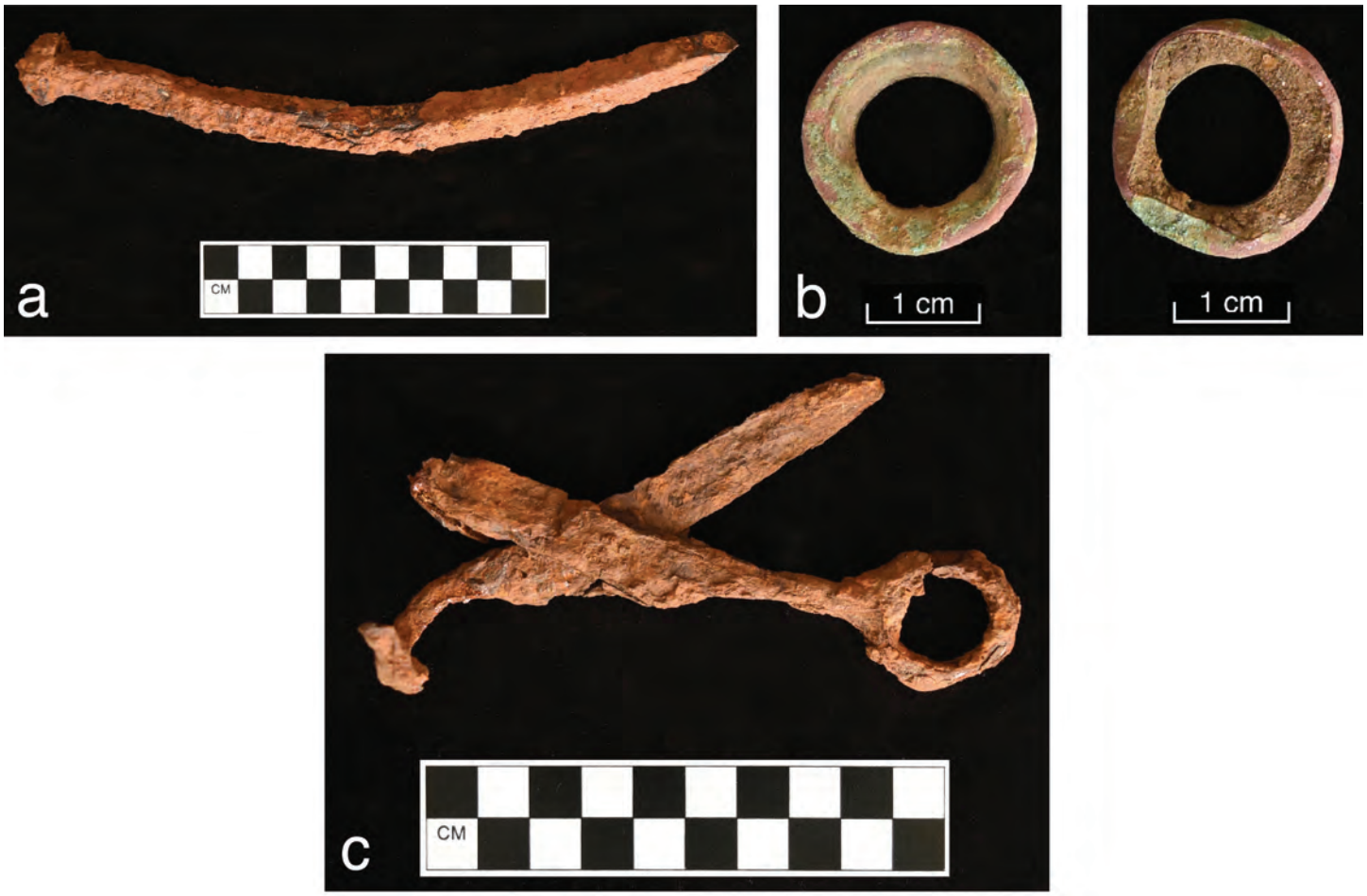


Figure 3.51. *Metal artifacts from the shallow portion of Trench E: (a) square ferrous metal spike (694.014); (b) a flat cuprous metal ring (694.015); (c) pair of ferrous metal scissors (708.005).(804.001); (l) Kokomo Pattern 600 vessel, 1905 (757.014, 819.001, and 821.001); (m) manganese machine-made glass food tumbler, 1906-1918 (767.012); (n) milk glass, unidentified pattern (771.004).*

Figure 3.52. *Metal artifacts from the deep portion of Trench E: (a) ferrous metal caster (767.020); (b) white metal oval drawer pull (1075.001); (c) lead bird shot (760.004); (d) shell casing from a 45-70 rifle round marked "UMC SH" (757.001); (e) unmarked 12 gauge shotgun shell (782.008); (f) cuprous button (876.004); (g) cuprous tie clip (734.001); (h,i) red enameled makeup compact (745.001); (j) United States copper penny (767.021); (k) metal paint can with dried red paint (782.009).*

While they made up a large portion of the artifact assemblage from Trench E, the metal artifacts provided little information about the chronology of the archaeological deposits. Most were likely associated with the graves rather than the refuse deposits.

Other Materials

Other materials, consisting of faunal material, architectural debris, leather, and plastic/rubber artifacts made up the smallest portion of the artifact assemblage from Trench E. Table 3.23 shows the types of other materials recovered in the shallow and deep portions of Trench E. Faunal material made up about half of the recovered other materials, followed by unmarked bricks, leather shoe fragments, and coal/clinker. The faunal material, which will be fully analyzed at a later time, appears to be largely comprised of meat cuts from large animals, specifically cows and pig.

Table 3.23. Other artifacts from the shallow and deep contexts in Trench E.

Material	Trench E Shallow		Trench E Deep		Trench E Total	
	Count	%	Count	%	Count	%
Bricks/Mortar	10	17.2	28	19.2	38	18.6
Chipped stone (precontact)	1	1.7	1	0.7	2	1.0
Clay/Composite Roller Skate Wheel	1	46.8	0	0.0	1	0.5
Coal/Clinker	4	6.9	7	4.8	11	5.4
Fabric	0	0.0	5	3.4	5	2.5
Faunal	39	67.2	73	50.0	112	54.9
Leather shoe fragments	1	1.7	27	18.5	28	13.7
Plastic Shotgun Shell	1	1.7	0	0.0	1	0.5
Rubber Shoe Heel	0	0	1	0.7	1	0.5
Rubber Tennis Ball	1	1.7	0	0.0	1	0.5
Unidentified rubber	0	0.0	3	2.1	3	1.5
Vinyl record fragment	0	0.0	1	0.7	1	0.5
Total	**58**	**28.4**	**146**	**71.6**	**204**	**100**

Six artifacts from this category were retained (Figure 3.53). Two bricks marked "TULSA" (694.017) from the shallow context were made in 1932. A fire brick from the deep context had a portion of the Edwards & Howard Company of St. Louis (722.022). These bricks were made from 1867 through the mid-20th century. Numerous bricks were observed during the backhoe excavations, particularly in the upper levels, but undecorated brick was not retained for analysis. A clay roller skate wheel marked "KWITITE FO-MAC" (694.016) was recovered from the shallow context. This artifact dates to the mid-20th century. A portion of what appears to be a polished bone or horn bangle (767.019) was recovered from the deep context. The oldest artifacts from Trench E were two pieces of precontact chipped stone. One was a core tool (700.003) made from Boone chert recovered from the shallow

Figure 3.53. *Other artifacts recovered from Trench E: (a) one of two bricks marked "TULSA," 1932 (694.017); (b) Edwards & Howard Company of St. Louis fire brick, 1867-1950s (722.022); (c) clay roller skate wheel marked "KWITITE FO-MAC," mid-20th century (694.016); (d) polished bone or horn bangle (767.019); (e) Boone chert core tool (700.003); (f) Peoria chert utilized flake (942.005).*

context and the other was a utilized flake (942.005) made from Peoria chert from the deep context. Both cherts are sourced to northeast Oklahoma.

Trench E Artifact Density and Distributions

The artifact assemblage from Trench E consist of 6,662 total artifacts.[3] The shallow portion of Trench E measured 233 m^2. With 773 recovered artifacts, the density is 3.3 artifacts per square meter. Only Trench B had a lower artifact density. The deeper trench measured 366 m^2. With 5,352 recovered artifacts, the density is 14.6 artifacts per square meter. This is the greatest density of artifact in any of the trenches at Oaklawn Cemetery.

Figure 3.54 provides a map of the artifacts that cross mend between the shallow and deep contexts in Trench E. One of these cross-mends, the hand-painted vessel with blue, green, yellow, and orange floral motifs (706.001, 708.001, and 729.012, see Figure 3.31a), was recovered only from the shallow contexts. The artifacts that mend between shallow and deep contexts include early 20th century artifacts like a press molded carnival glass vase (714.003, 737.002, and 753.002, see Figure 3.50a) and 19th century artifacts like the copper luster ironstone platter with the Alfred Meakin mark (698.001, 767.004, 782.001, and 913.002, see Figure 3.38c). The

3 537 artifacts from Trench E were recovered from contexts that could not be assigned to the shallow or the deep trench, including artifacts from the back dirt piles and wall slumps. These artifacts are not included in the density calculations, which were made for the 6,175 artifacts from the shallow and deep trenches.

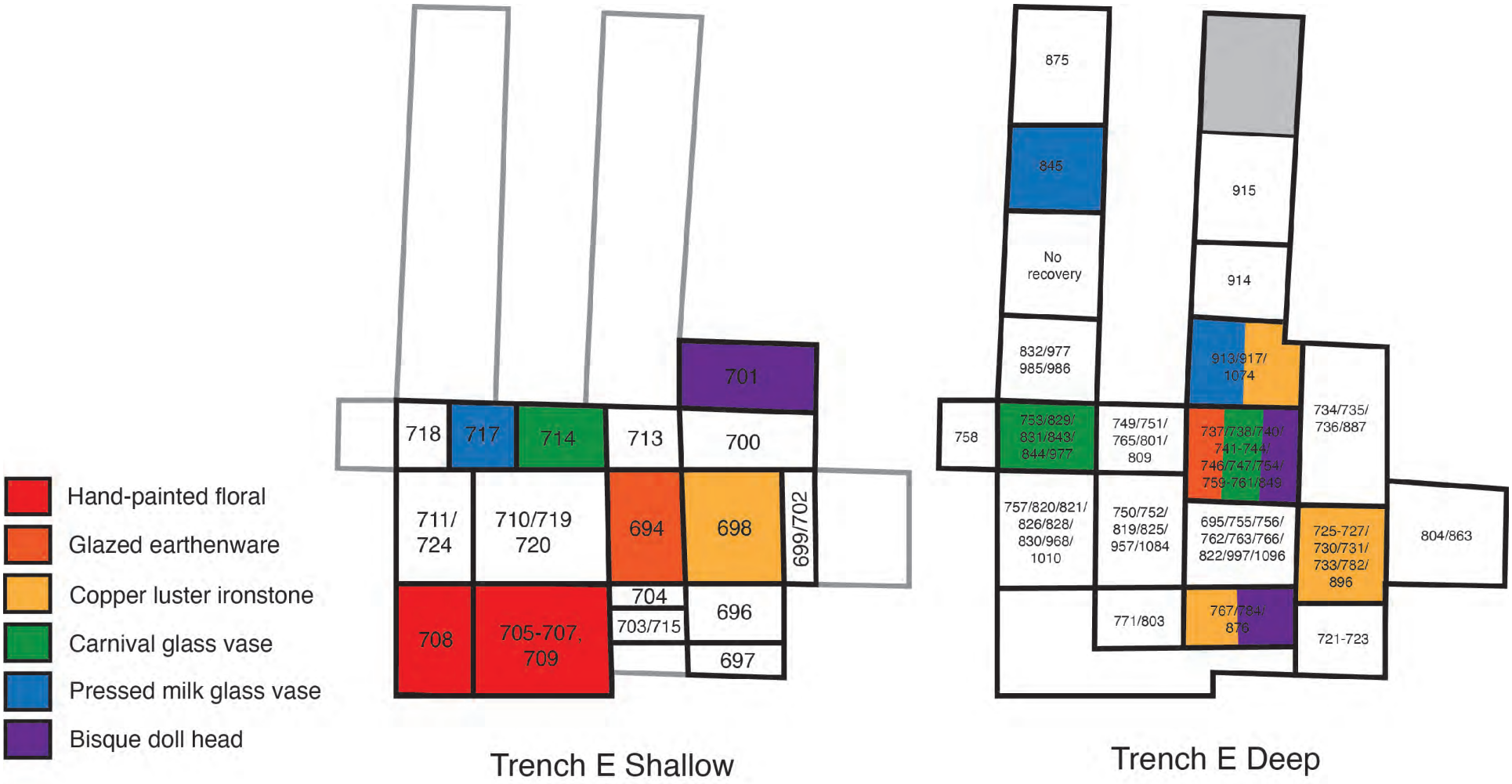


Figure 3.54. *Locations of artifacts that cross-mend from the shallow contexts in Trench E.*

presence of a handful of artifacts that mend across the deep and shallow contexts is expected given the use of a backhoe to excavate this area.

More artifacts from the deeper contexts cross-mended. Figure 3.55 shows the locations of 12 mended ceramics from the deeper contexts in Trench E. The artifacts include mid to late 19th century Albany slip stoneware (757.021, 782.010, and 831.008), brown aesthetic transfer-printed sherds (732.001, 767.002, and 782.002, see Figure 3.36b), and a green transfer-printed teacup (752.001, 755.001, and 756.001, see Figure 3.36c). Several artifacts, including sherds with a Homer Laughlin makers mark (751.003 and 737.001, see Figure 3.39a) and cream-glazed light blue sponge decorated sherds (757.005, 767.006, and 831.002, see Figure 3.37b) were made at the very end of the 19th or the start of the 20th century. Other artifacts were made in the early to mid-20th century, like the light blue stoneware bowl (729.011, 751.001, 759.001, 913.001, and 1084.001, see Figure 3.37b), the molded, spattered yellow ware (729.010, 757.004, 826.003, 829.001, and 942.002, see Figure 3.37a), and the geisha girl hand-painted porcelain (727.002, 767.001, and 876.001, see Figure 3.38a) were made in the 20th century. Seven glass artifacts from the deep contexts mended, shown in Figure 3.53. Only one of the artifacts has a firm date, the pattern molded glass (757.014, 819.001, and 821.001, see Figure 3.50d) in Kokomo Glass Company Pattern 600, which was made in 1905. The deep blue aqua glass tumbler (727.003, 729.018, 767.013, 782.009, and 822.004, see Figure 3.50c) is likely from the early 20th century.

Artifact densities were calculated for the deep contexts in Trench E. Figure 3.57 shows the distribution of artifacts by count. Artifacts are concentrated in four areas. The artifact counts drop off heavily to the north as the elevation rises in the cemetery. The density of artifacts by weight, shown in Figure 3.58, is only slightly

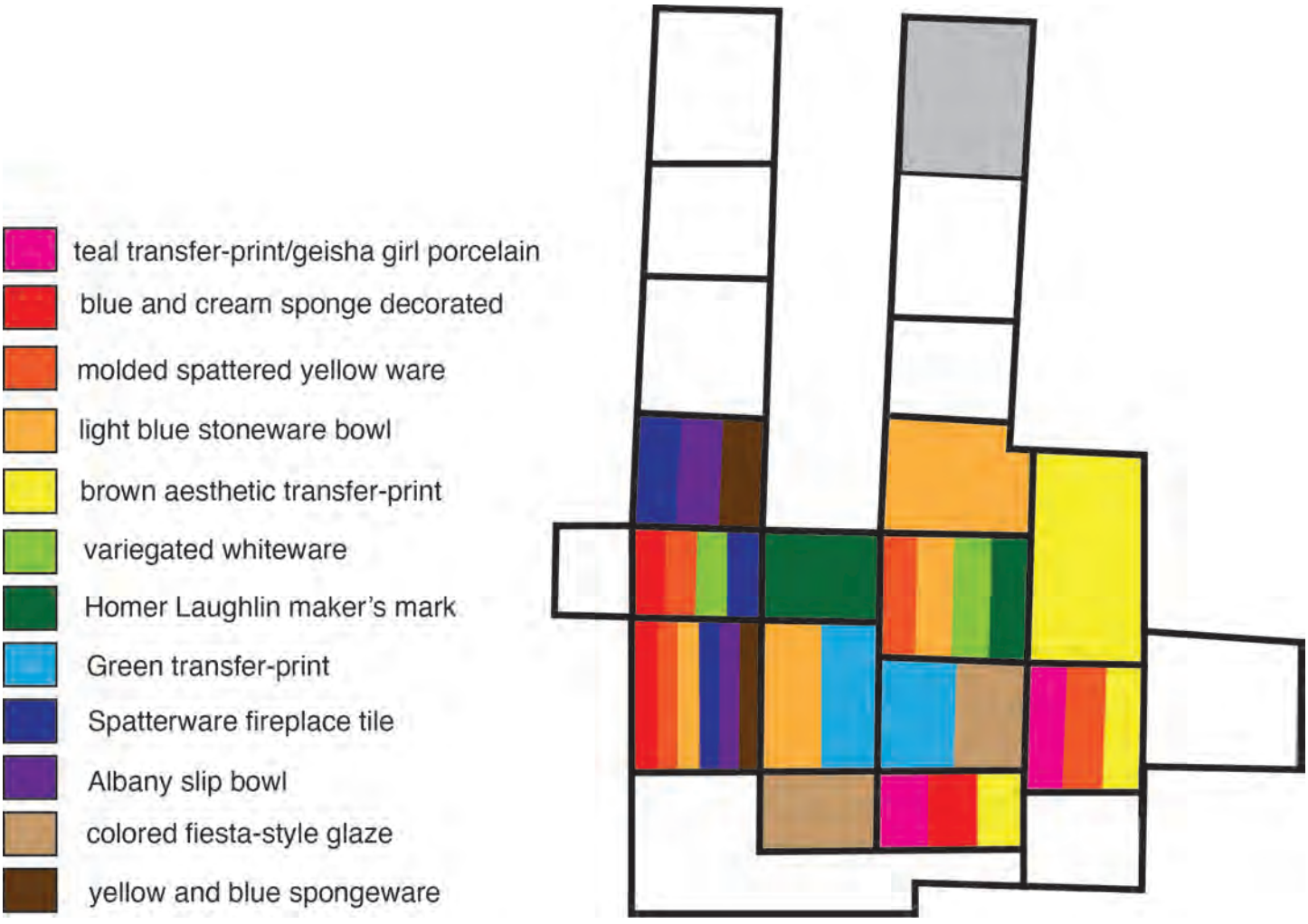


Figure 3.55. *Locations of ceramics that cross-mend from the deep contexts in Trench E.*

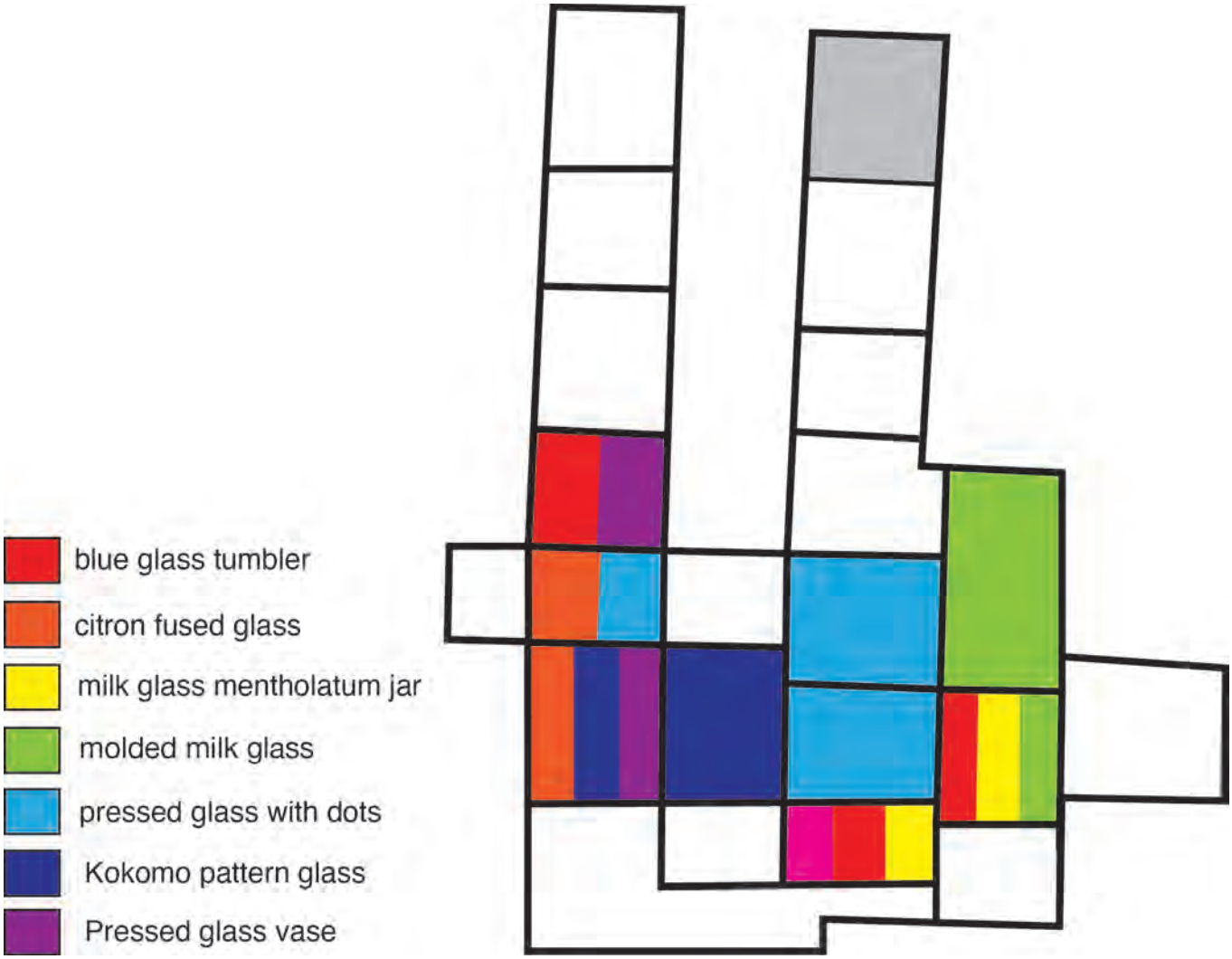


Figure 3.56. *Locations of glass that cross-mends from the deep contexts in Trench E.*

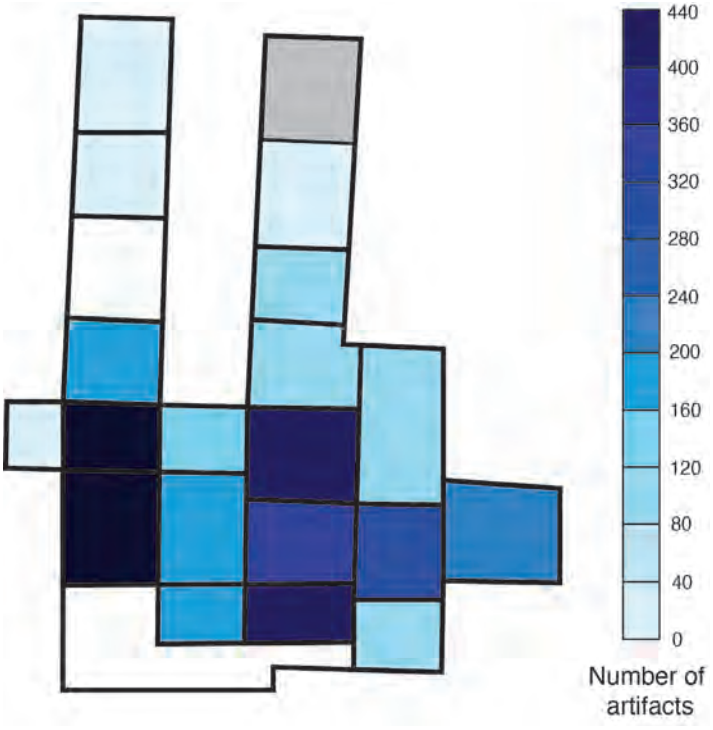


Figure 3.57. *Counts of artifacts from Trench E by context.*

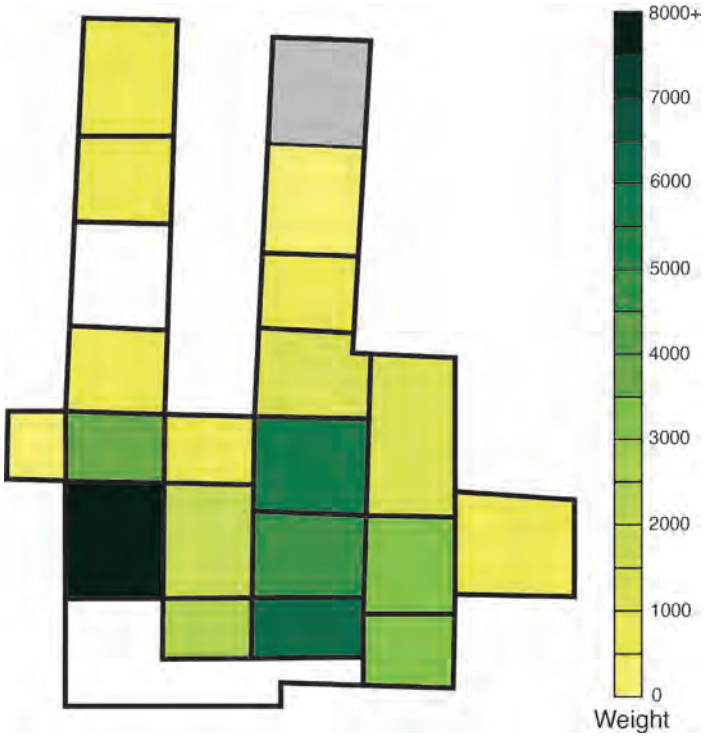


Figure 3.58. *Weights of artifacts from Trench E by context.*

different. Artifacts are most concentrated in two north-south lines, one on the western edge of the trench and the other roughly in the middle. During the backhoe excavations, artifacts were uncommon in the upper layers and increased as the backhoe got deeper, typically well past one meter in depth. The recovered artifacts are both in the fill dirt used to raise the area and were deposited as refuse along the stream, similar to Trench A – D.

The artifacts from the upper levels of Trench E, from 0 to about 30 centimeters below surface, are later in time. Excavations demonstrated a ground surface dating to the 1920s in this area, indicated by the bricks, temporary markers, and grave decorations sitting on this surface. Most of the artifacts that date after 1920 and into the mid-20th century came from the upper contexts. Like Trench A – D, some portion of the artifacts in the upper levels also were left behind by cemetery visitors. Some of the shallow context artifacts are from the late 19th and early 20th century, like the artifacts from the deeper Trench E contexts. Like the lower Trench A – D artifacts, most of the deeper Trench E artifacts were made between 1890 and 1910.

Figure 3.59 shows the density maps of both excavation areas in relation to one another overlain on an aerial photograph of Oaklawn Cemetery. The map of density in both trenches shows that artifact density was greater in Trench E than in Trenches A - D. In borth trenches, artifact recovery was greatest at or below about one meter below the surface. The majority of the late 19th through early 20th century artifacts came from the dark, laminated silty deposits associated with the stream that flowed across the southern portion of the excavation area.

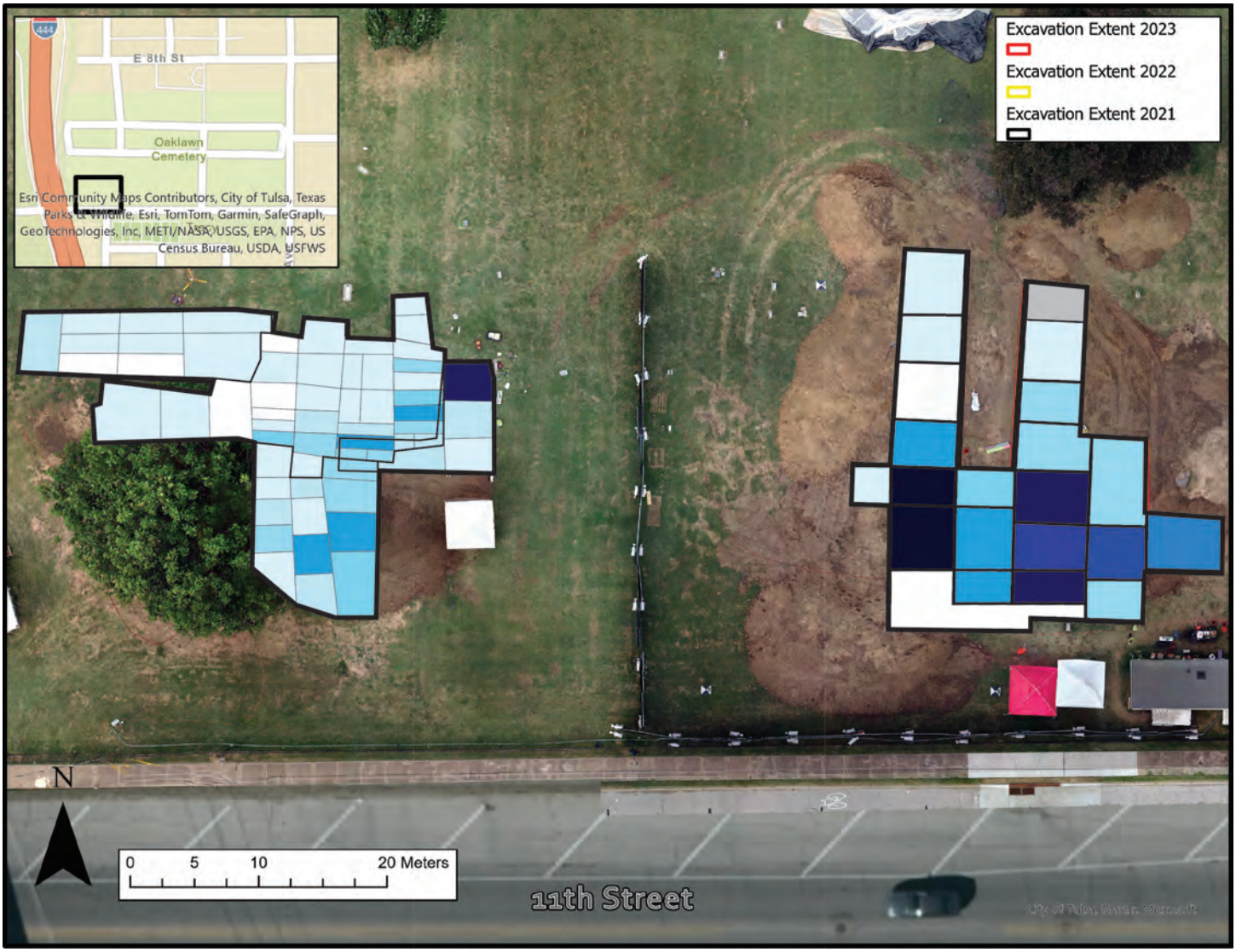


Figure 3.59. *Artifact densities by count in Trenches A-D and Trench E showing the overall higher density of artifacts in Trench E.*

Before the area was filled in and raised to its current elevation, the soils in the southwest corner of the cemetery were frequently saturated from this stream and another north-south flowing stream near the west boundary of the cemetery. Those two streams joined somewhere near the current southwest corner of the cemetery. Until about 1917, this corner of the cemetery would have been swampy and low-lying, making it an ideal location to dispose of household refuse.

Population Growth in Tulsa and Trash Disposal

A brief study of the historic maps of the area provides an idea of who might have been disposing of their household refuse in this corner of Oaklawn. The earliest burial at Oaklawn dates to 1878, a time when the rural area surrounding Oaklawn was within the Muscogee Nation. The cemetery was used by Muscogee Nation citizens, some of whom likely resided around in the area, in the late 19th century and into the early 20th century. White settlers began arriving in Tulsa after 1882, when a railroad line was established, and came into the area in greater quantities when settlement was opened in 1892. The dates of the recovered artifacts indicate Oaklawn's use as a refuse dump roughly coincides with its initial use as a cemetery. The artifact assemblage indicates that some of the refuse could have been deposited by local residents during this period, but it is likely more of it was disposed of after 1900.

The cemetery was annexed by the City of Tulsa in 1904 during the period that land was being alloted to citizens of the Muscogee Nation under the Dawes Act. After 1904, the Old Potters Field was established in the southern part of the cemetery. At the time the cemetery was established, the southwest corner was still low-lying, saturated land and was not used for burials. A 1910 Census Enumeration map of Tulsa that shows census districts (Figure 3.60) has Oaklawn bordered on the south, north, and east with multi-acre allotments. The Perryman, Hodge, Berry, Childers, and Kreiger families claimed and likely resided on the allotments surrounding Oaklawn. It is unclear how many residences were located on these allotments. Residential lots adjacent to the northwest corner of the cemetery are designated the "Burnett Addition." Trash disposal in the southwest corner of Oaklawn cemetery increased in frequency during the last years of the 19th century and into the first years of the 20th century, possibly coinciding with the development of the Burnett Addition residential area. Refuse disposal did not taper off when Oaklawn was annexed by the City of Tulsa.

During the 1910s, Tulsa's continued to boom economically following the 1905 discovery of the grand Glen Pool oil reserve. The population increased roughly six-fold, going from around 18,000 in the 1910 census to about 75,000 in the 1920 census. By 1914, the Claremore topographic quadrangle map illustrated by Green (2022:49) in the geoarchaeological chapter of the 2020 and 2021 excavation report shows the land to the north and east of the cemetery divided into city blocks. New oil discoveries beginning in 1915 drew even more people to the area. The 1918 Aero Map illustrated in Green's (2022:50) chapter shows a number of houses, one of which is quite large, surrounding the cemetery on all sides. The 1920 Census Enumeration map (Figure 3.61) shows only one remaining allotment south of Oaklawn. New housing and new residents meant a need for more garbage disposal, and the artifact assemblage suggests that as Tulsa expanded in the early 1910s, refuse dumping increased in the southwest corner of the cemetery.

As the population of Tulsa grew and became more economically prosperous, the amount of refuse generated by its citizenry increased dramatically. The 1910 Tulsa Directory published by the Hoffhine Directory Company lists the city Superintendent of Garbage, an appointed office, as Ed Dolan. In the 1920 city directory, Dolan was out and D. L. Long served as the Chief Sanitary Inspector. For city santitation, "garbage" and "trash" were two different categories. "Garbage" consisted of kitchen scraps and some bathroom refuse and "trash" encompassed everything else, like broken dishes and crockery, empty glass bottles and jars, broken down stoves and furniture, worn-out metal tools and containers, old bricks, plumbing fixtures, and tiles, and a wide variety of other inorganic waste. Luke Williams of the Tulsa Historical Society conducted a search of Tulsa newspapers from 1920 and discovered that the haphazard nature of garbage collection within city limits was creating sanitation problems for

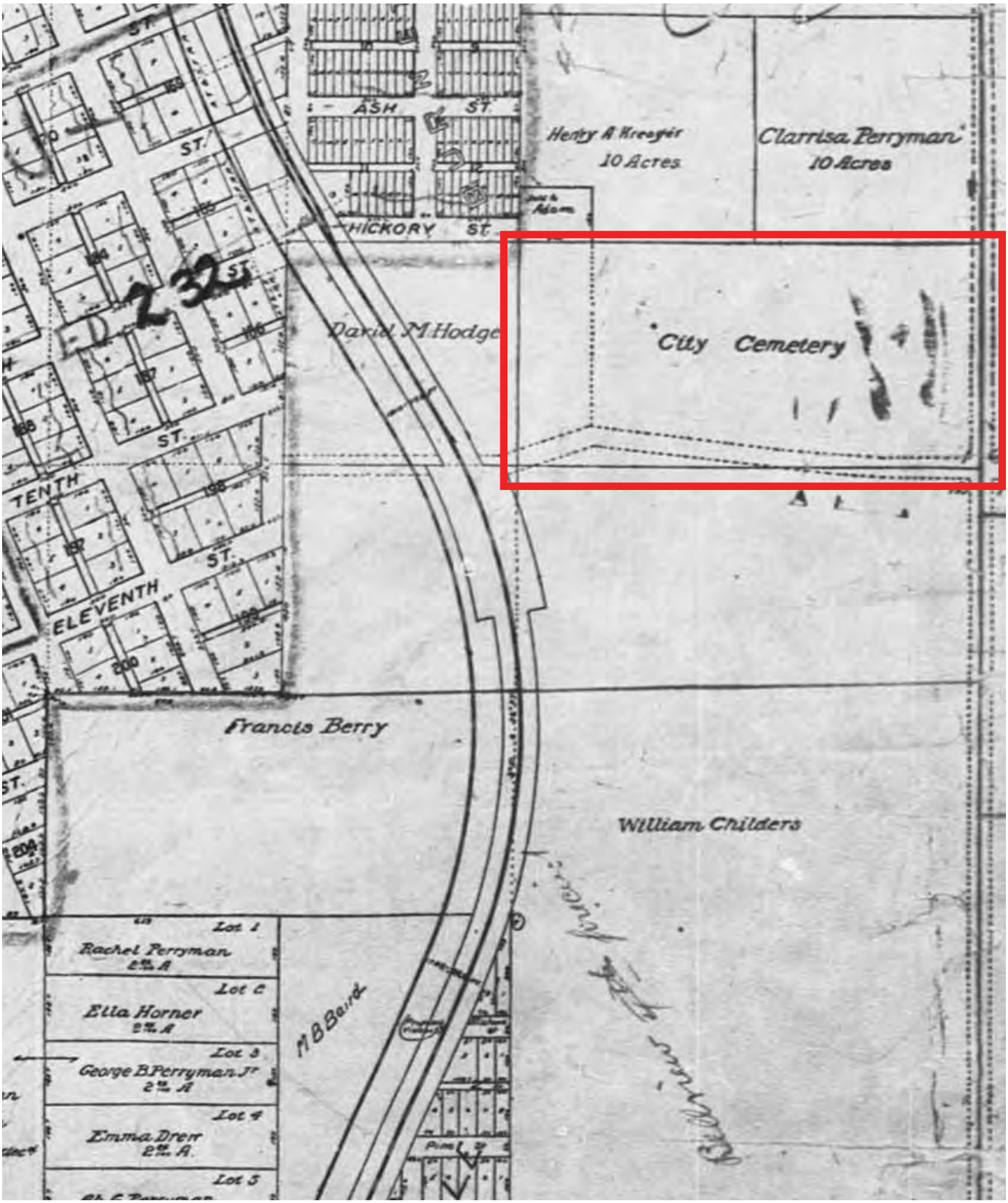


Figure 3.60. *Portion of the 1910 United States Census Enumeration Map for the city of Tulsa showing districts for census workers. Oaklawn Cemetery is depicted as "City Cemetery" is surrounded in red. A high-density residential area is located northwest of the cemetery. The large tracts of land surrounding the cemetery are existing Muscogee alottments with names of the owners listed.*

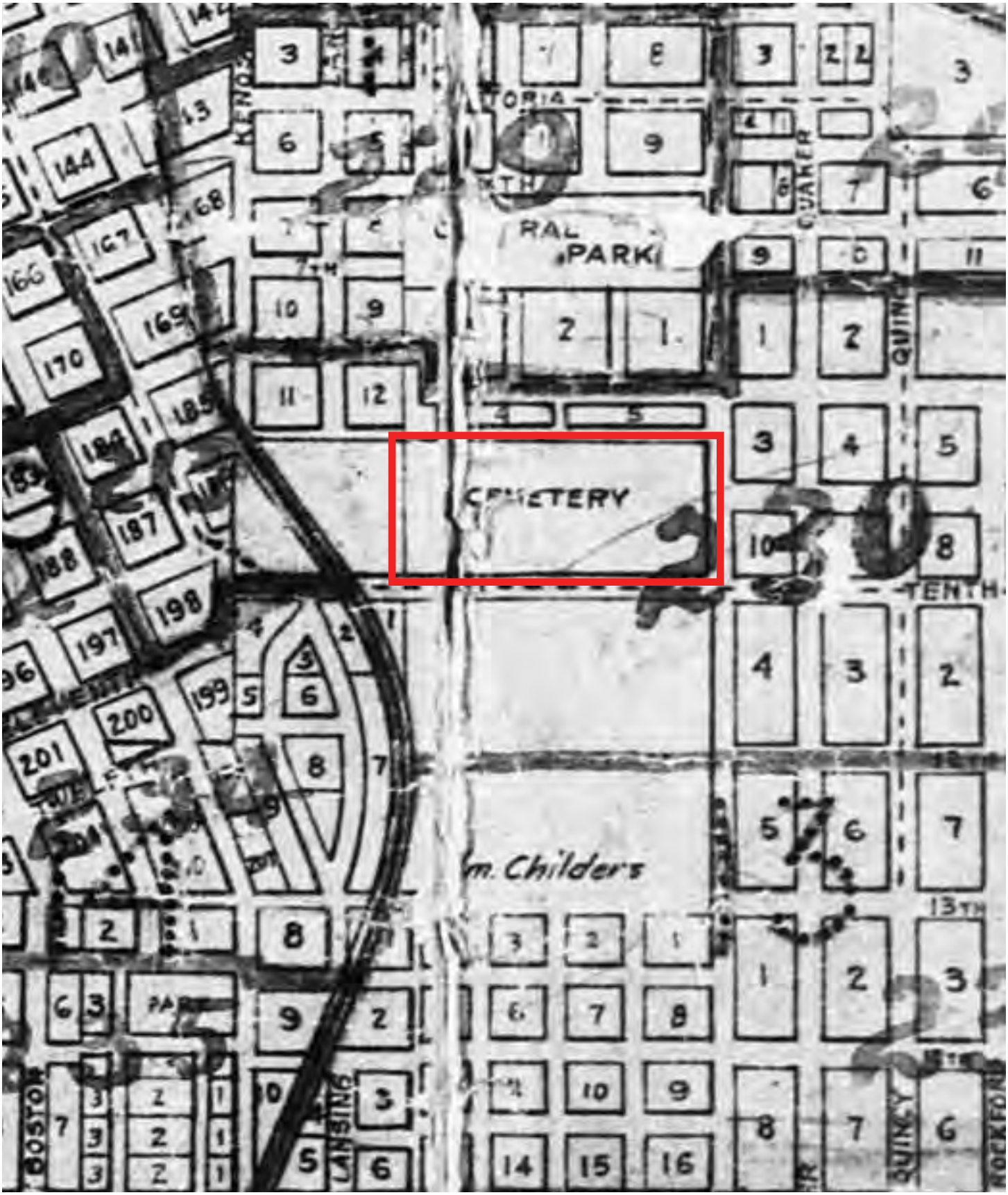


Figure 3.61. *Portion of the 1920 United States Census Enumeration Map for the city of Tulsa showing districts for census workers. Oaklawn Cemetery is depicted as "City Cemetery" is surrounded in red. Residential and commercial lots are border the cemetery on three sides and only one allotment remains.*

Tulsa residents. The city had contracted with J. W. Sunderland to haul away garbage and dispose of it at hog farms outside of the city. On August 26, 1920, the Tulsa Tribune reported that two city hall would be sending out two "emergency garbage trucks" in response to numerous public complaints. This accumulation of rotting food waste in the hottest part of the summer had also drawn the attention of the Dr A. R. Lewis, who was the Oklahoma State Superintendent of Public Health, who advised that the city undergo a mid-summer clean up campaign to clear away garbage.

By September 1, 1920, the city had terminated the contract with Sunderland and signed a new contract with David Shipman and S. V. Thompson, who owned large hog farms outside of the city, to collect and haul garbage away to use as feed. Complaints were continuing to pile up, but Shipman promised additional garbage vehicles. The article notes that trash collectors were doing and especially poor job in "outyling residence areas" the city, which likely includes the neighborhoods around Oaklawn cemetery. The spotty nature of garbage service through 1920 explains the presence of abundant garbage (in the form of faunal remains) and trash (everything else) in the dump areas in the southwest corner of Oaklawn.

The New Potters Field in the southwestern corner of Oaklawn was not established until 1917. The geoarchaeological analysis of Oaklawn cemetery (Green 2022) documented at least two man-made fill events in the southwest corner of Oaklawn Cemetery that raised the ground to its current level. It is unclear exactly when this area was first raised with imported fill, but it is thought to have happened around 1917, coninciding with the expansion of the Old Potters Field (Stackelbeck and Maggard 2022). The age of the analyzed artifact assemblage supports this. The latest date for most of the refuse is estimated at 1915, although there certainly could be a couple of years of wiggle room in this estimate, and refuse could have been dumped in the southwest corner of Oaklawn as late as 1917.

Conclusions

This analysis of non-mortuary artifacts from Trenches A – D and Trench E was conducted to aid in the interpretation of the site formation processes and the history of the southwest corner of Oaklawn Cemetery. The household refuse artifacts from Trenches A – D and Trench E were deposited in three ways – by visitors to the cemetery during the early to mid-20th century, in fill used to raise the level of the ground surface sometime during the early 20th century, and as refuse from the allotments and nearby neighborhoods between roughly 1890 and 1917. The artifacts left behind by cemetery visitors are comprised largely of glass containers, particularly jars and bottles, and decorative tableware. The containers may have been from food and beverages consumed in the cemetery or they may have been placed as mementos on graves. The fill artifacts were comprised of household refuse. The bulk of the artifacts, particularly from Trenches A and D and likely Trench E appear to be household trash deposited in the area before it became part of Oaklawn Cemetery. These artifacts, most of which were recovered from depths well over a meter, date before the 1920s and are not related to the use of the area as a cemetery. Many likely were dug up and then redeposited when individual graves were dug and refilled during the 1920s, which accounts for the late 19th/early 20th century artifacts in individual grave shafts.

CHAPTER 4

ARCHAEOLOGICAL FINDINGS FROM EXCAVATION BLOCKS B-E

by Kary L. Stackelbeck, Ph.D. and Ryan Peterson

Earlier and on-going phases of our investigation revealed that likely victims of the 1921 Tulsa Race Massacre are buried amongst non-victims in the Original 18 Area—the southwest corner of Oaklawn Cemetery (Figures 4.1 and 4.2). Some appear to be in close proximity to one another but do not appear to be buried in obvious rows or contiguous plots. This creates challenges to the process of discovery, but the archaeological methods we are employing (Chapter 2 and Appendix A, this volume) demonstrate our ability to successfully locate unmarked graves and respectfully recover the remains of individuals who fit some or all of our search parameters for this area—namely adult men who suffered trauma and were buried in simple wooden caskets. Our excavation process provides detailed documentation of the individual remains and their burial context, which facilitates osteological evaluations by the forensic team (Chapter 5, this volume) and the ensuing DNA recovery. It also meaningfully informs the genetic genealogical process. Our methods also allow us to continue to fully evaluate the various leads that guide our investigation, acknowledging that oral historic accounts may not be precise and urban development since 1921 has dramatically altered the locations of interest throughout the City of Tulsa.

When taken collectively with the previous results, the archaeological data presented here expand our understanding of the nature of the burials and their context in Oaklawn Cemetery. This is particularly important in Section 20, which lacks better documentation that exists elsewhere in the cemetery—such as well-maintained markers and ledger entries with names of individuals buried in specific plots. The archaeological data help to recover some understanding of those who were interred in this part of the cemetery, particularly when combined with forensic, genetic, and genealogical data.

This chapter presents a summary of archaeological data gleaned from the burials that were exhumed in the 2022-2023 field seasons. Detailed descriptions of these burials and those who were documented but left in place are found in Appendix A of this volume. A more comprehensive assessment is provided in the forthcoming volume on the 2024 investigations.

2022-2023 Exhumed Burial Population

Over the course of the 2022 and 2023 field seasons, 16 individuals who appeared to meet—or partially meet—the search parameters as possible massacre victims were exhumed from 15 graves in Section 20 of Oaklawn Cemetery. Eight individuals were exhumed from Block B, four from Block D, and four from Block E (Figures 4.2-4.3, Table 4.3).

No burials in Block C were exhumed. Among the graves documented in Block C, eight were of subadult size and three were adults in caskets with decorative hardware. For example, Burial 58 consists of an adult female interred with several personal effects in a casket that was likely commercially-produced. The associated objects, the type of burial container, and her excellent state of preservation are distinctive compared to other burials examined elsewhere in Section 20 (Appendix A, this volume). Our initial interpretation is that Burial 58 and others in Block C post-date the Massacre.

Among the 16 exhumed individuals from the remaining excavation blocks, three are females and twelve are males (Table 4.1, Figure 4.3). One stillborn infant was placed in the casket between the legs of an adult male in Burial 124 (Appendix A: Figure 147). Detailed documentation of the feature indicates that these two individuals were placed intentionally within one burial container—as opposed to one being intrusive into the other.

Archaeological Evidence of Trauma

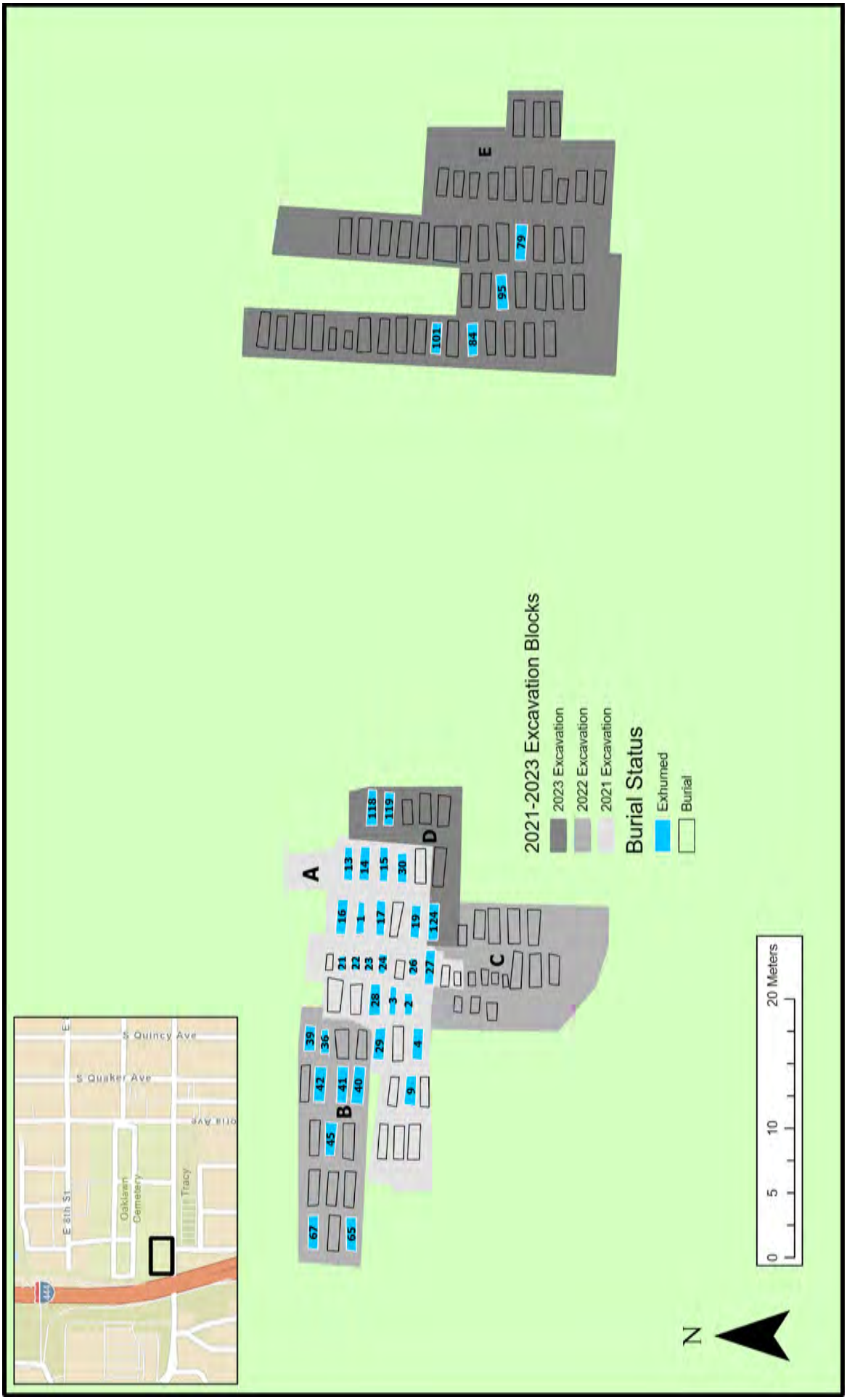


***Figure 4.1**. Distribution of graves of exhumed individuals among other documented burials in Excavation Blocks A-E of Section 20 in Oaklawn Cemetery.*

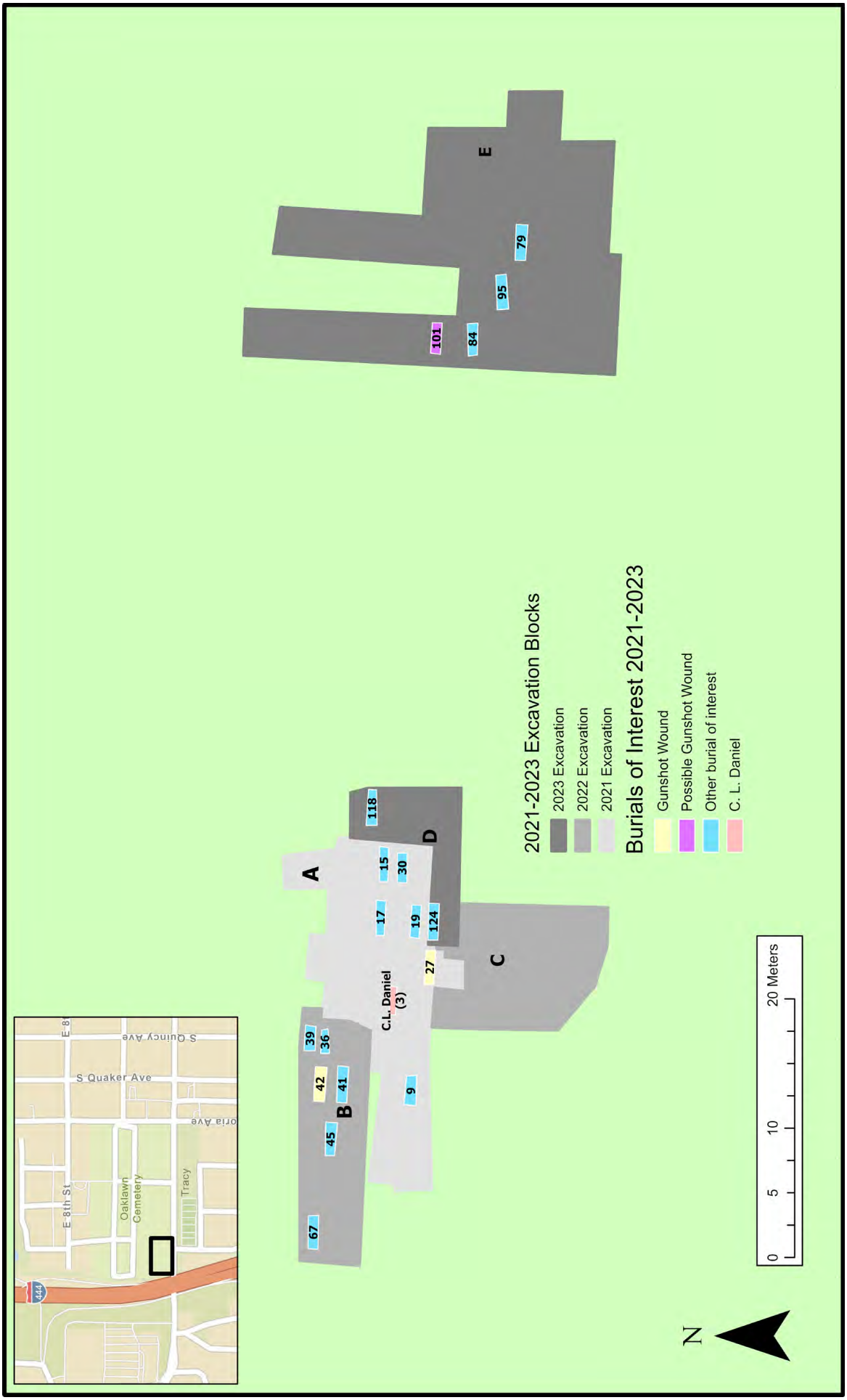


***Figure 4.2**. Distribution of burials of interest as located during the 2021-2023 phases of the investigation.*

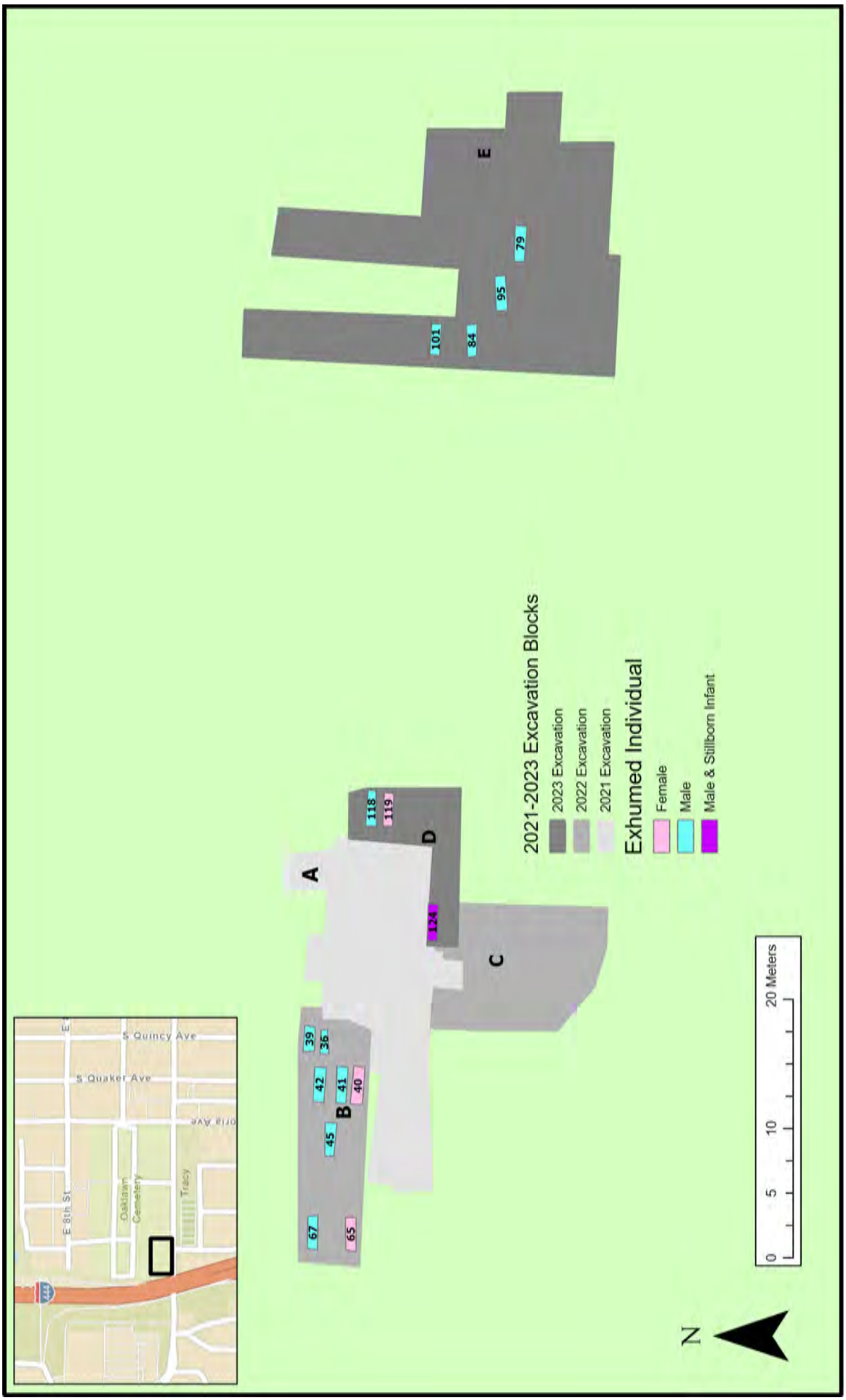


***Figure 4.3**. Distribution of graves of individuals exhumed in 2022-2023 from Excavation Blocks B-E based on biological sex.*

Table 4.1. Burials exhumed in the 2022-2023 field seasons.

Burial #	Excavation Block	Biological Sex
36	B	Male
39	B	Male
40	B	Female
41	B	Male
42	B	Male
45	B	Male
65	B	Female
67	B	Male
79	E	Male
84	E	Male
95	E	Male
101	E	Male
118	D	Male
119	D	Female
124a	D	Male
124b	D	Stillborn Infant

No bullets or other indications of trauma were observed among these 16 individuals at the time of excavation. The forensic team did, however, discover indications of trauma for one individual (Burial 42) and possible trauma for two others (Burials 101 and 65) (Chapter 5, this volume). The individual in Burial 42 was a gunshot victim based on the recovery of several bullet fragments from his cranium. Munitions specialist, Douglas Scott, Ph.D., examined the lead fragments, which likely were part of a single bullet "that partially disintegrated or splintered on impact" (Scott np). The combined weight of the fragments is consistent with bullets that were recovered in 2021 from Burial 27 (Peterson et al. 2022:71-72; Stackelbeck and Maggard 2022:94; Stubblefield 2022:212-218), which were "likely fired in a Colt revolver, although Hopkins and Allen or a Forehand and Wadsworth firearms cannot be definitively ruled out" (Scott np). Additional details about Dr. Scott's assessment of the munitions from Burial 42 and other individuals are included in the forthcoming technical report on the 2024 investigations.

No evidence of a bullet was found during excavation of Burial 101, but X-rays revealed unidentified radiopaque fragments near his right arm and face. It is unclear whether these fragments are from a projectile, but he otherwise meets two of the search criteria (adult male in a simple wooden casket).

Burial 65 was that of an adult female with several skeletal elements that display fractures that may be associated with her time of death (Chapter 5, this volume). As a female, she does not fit the description of documented Massacre victims. However, as a possible trauma victim buried in a simple wooden casket in proximity to at least one gunshot victim (Burial 42) who more closely matches the profile, she continues to be of

archaeological interest—particularly in comparison to other individuals whose burials have been investigated in this part of the cemetery.

Burial Containers

Standardization and commercialization of undertaker or funeral home practices took hold following the Civil War and were prominent by the early 20th century (Aguero 2022). The use of rectangular caskets—as opposed to octagonal coffins—had become more common by this time (Brennan 2007). Industries that produced caskets commercially allowed funeral homes to keep some in stock or to purchase and have them shipped as needed (Brennan 2007), but not to the exclusion of local manufacture—particularly of simpler forms. Locally produced wooden caskets were often less expensive, but undertakers still generally maintained professional pride in making them with attention to detail—such as accuracy of container size to adequately fit the decedent (Crane & Breed Manufacturing Company 1921). Beyond the basic functional purpose of burying the dead, characteristics of the container can also reveal information about the intended treatment of the decedent, the context of their death, and/or the care taken by those who were responsible for burying them.

Fifteen of the 16 exhumed individuals in the 2022-2023 burial population were interred in simple wooden caskets without decorative hardware. Two individuals—one adult male and one fetus—were buried together inside one casket (Burial 124). One individual—Burial 42—was interred in a wooden crate that was repurposed as a burial container.

Analysis by paleoethnobotanist, Jennifer Haney, Ph.D. at the Oklahoma Archeological Survey, indicates the containers were produced from trees of the following taxa: conifer (n = 3), fir (n = 1), bald cypress (n = 2), pine (n = 5), and southern hard pine group (n = 3) (Appendix F, this volume; Figure 4.4). One burial container in this group, that of Burial 101, was manufactured from an unidentified type of wood. Of interest is the fact that two of the containers (Burials 65 and 95) were manufactured from uncured pine that had not been properly dried.

Among the 14 wooden caskets, only two containers had the same length and width dimensions (Burials 41 and 45), though they were manufactured from different types of wood. The variability in size of these containers, coupled with the use of various types of wood that would have been locally (or regionally) available, suggests local manual construction. They may have been produced at or near the time of use and tailored to suit the size of the decedent. However, several of the caskets were too small—or nearly so—for the individuals they contained (Burials 45, 84, 95, 119, and 124); Figure 4.5).

That was not the case for Burial 42. The container for the individual in Burial 42—a shipping crate—was necessarily large to accommodate his unusually wide girth (Appendix A: Figure 18). The use of a repurposed crate may have provided an expedient solution for both transport and interment of this individual who was likely in a bloat phase of decomposition at the time of burial (Chapter 5 and Appendix A, this volume).

Nearly half of the containers used for individuals exhumed in 2022-2023 (n=7 or 46.7%) were somehow unusual. The use of a repurposed shipping crate, a casket that is too small for the decedent, or substandard building materials (such as "green" wood) may reflect one or multiple of the following behaviors: hasty burial; intentional disrespectful treatment; lack of access to appropriately cured wood; economical use of raw materials; inexperience of the craftsman; or lack of involvement or advocacy by loved ones in burial preparations.

Burial Position

Fourteen of the 15 adult decedents were buried in the extended supine position—on their backs with their legs extended (Appendix A). One individual—Burial 36—was buried somewhat on his side in a partially extended position. It is unclear if this reflects intentional placement of his body in this configuration or if his body rolled to the side as his casket was lowered into the grave shaft.

Among those buried in the more traditional supine position, all but one (Burial 119) was positioned with their heads oriented on the west end of their graves. Interestingly, Burial 119—a female—is adjacent to Burial

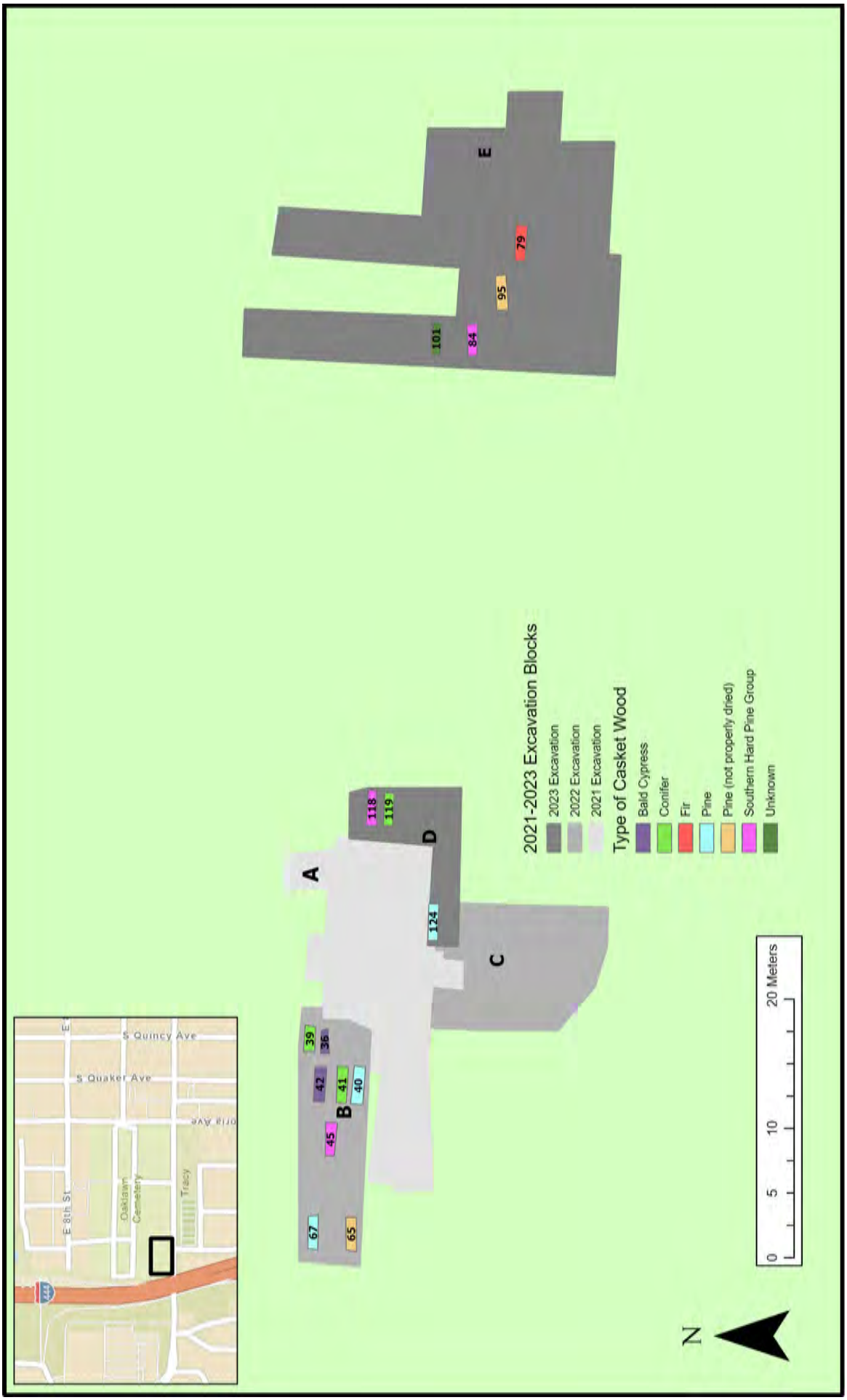


***Figure 4.4**. Types of wood identified for each container of the burials exhumed during the 2022-2023 field seasons; see full description in Appendix F.*

***Figure 4.5**. Distribution of 2022-2023 burials whose caskets appeared too small (or nearly so) for the decedent contained therein.*

15—one of the only other individuals who was similarly buried with his head to the east. Burial 42 was buried in the supine position, but his remains were flared in a manner that suggests he was interred at an advanced state of bloating (Appendix A: Figure 18).

Personal Effects

Personal objects were documented during the archaeological excavation of four of the exhumed individuals (Appendix A, this volume). A ring was still in place on a left finger of the man in Burial 41. Fragments of fabric, perhaps held together with an observed safety pin, were found with the gentleman in Burial 118, perhaps indicating remnants of a burial shroud. He also had a lead pencil on his person at the time of interment. Six matching brown buttons were found near the cranium of the adult male in Burial 124—though it is unclear what type of clothing or head-ware they might once have been attached to.

Burial 42 was distinctive among all other individuals who have been exhumed to-date for a variety of reasons—some of which were noted above. As it pertains to his personal items, Burial 42 appears to have been interred still wearing his clothes (coveralls?) and his left shoe/boot, but there was no archaeological evidence of his right shoe or foot. He had a variety of personal items in his pants pockets, including a possible pocketknife, a possible lighter, and several keys (Appendices A and C-E). The metal objects in his pockets had been fused together over time due to corrosion. Manual efforts to separate the objects were partially successful, but electrolysis performed by Gabriel LeBlanc, Ph.D. at the University of Tulsa proved more useful (Appendix C). Once liberated from the corrosive mass, the objects were subjected to pXRF analysis by Thomas Fenn, Ph.D. and Ella Brewer-Jensen at the University of Oklahoma to ascertain the composition of the metals from which they were manufactured (Appendix D). Historic key specialist, Tommas Pace, analyzed the keys and concluded that "their nature and functional use are most likely associated with a business location" (Appendix E).

While not necessarily considered personal artifacts, three of the exhumed individuals had gold teeth or crowns that were observable during excavation (Burials 40, 45, and 84). Additional personal items and gold teeth were documented during the forensic evaluations of these and other exhumed individuals (see Chapter 5, this volume). Such personal details can be important in the process of trying to recover these individuals' identities.

It is worth noting that there can be discrepancies between the archaeological and forensic assessments of objects found in association with burials. For example, some items may be encased in soil and not readily apparent at the time of excavation—only to be exposed and visible during the subsequent osteological examination. This is particularly the case for small metal objects—such as safety pins or bullet fragments—that become more visible upon X-ray examination. In other cases, the archaeologists may identify a given object differently than the forensic team. One such example occurred with Burial 84. A distinctive metal object from shaft fill above the casket dropped into the grave upon collapse of the container. The excavators noted the presence of the object and the likelihood that it was not intentionally placed among the remains. Archaeologists identified the object as the base of a metal lantern (Appendix A: Figure 89). Because of its position between the legs of this individual, the object was included with the exhumed remains and associated soil that were delivered to the on-site forensic lab. Upon X-ray of the object during their standard intake process, the forensic team misidentified the artifact as a probable pocket watch (Figure 5.146).

Post-Depositional Processes Affecting the Graves

The act of burying individuals in a cemetery upon their death represents primary deposition—we intentionally excavate a grave shaft and place a coffin or casket with the decedent into that hole and cover it with backdirt. We *deposit* the person into the ground and bury them. The archaeological signature of that process typically results in a relatively rectangular area of dirt—the shaft—that is disturbed above and around a casket that contains the physical remains of a decedent (Stackelbeck 2022: Figure 3.3). Over time, those remains become skeletonized and the container begins to naturally decompose—both processes add organic content to the soil above and around the burial. Anything that happens to alter the position of the skeletal remains or the container or otherwise disturb the burial context is considered a "post-depositional process." The study of such processes

is known as "taphonomy." It is important to understand the taphonomic forces affecting a given archaeological site or cemetery as it helps us more accurately reconstruct the primary context. Several taphonomic forces have impacted the burials documented in Section 20 of Oaklawn Cemetery.

As noted in the previous technical report (Green et al. 2022), much of Section 20 is affected by the presence of two relict streams that once flowed along the western and southern boundaries. These streams have impacted the burial context in three principal ways. First, the continued flow of water—albeit subsurface now—is having a homogenizing effect on the soils and sediments in this part of the cemetery. Second, the streams have been the locus of numerous episodes of dumping of trash and deposition of fill dirt. Indeed, the burials that have been documented to-date in the southern relict stream channel were buried entirely within layers of domestic trash and artificial fill and covered by additional layers of fill dirt. The cumulative effect is a context where it difficult to discern the grave shafts, which are normally relatively easy to distinguish archaeologically from the surrounding soil matrix. Despite the difficulties in archaeological visibility, we have successfully documented 121 graves in this part of Oaklawn Cemetery.

The third effect of continued waterflow in the southern part of the cemetery is postdepositional movement of human remains inside the caskets. Among the burials exhumed in 2022 and 2023, at least five (Burials 41, 42, 67, 79, and 84) display evidence of dislocation of some remains, likely at a stage of decomposition when at least some soft tissue was still present. In these cases, select skeletal elements have clearly shifted while others remain in their correct, articulated anatomical position (Appendix A:Figures 16, 18, 69, 82, and 88). Several of these burials also contained layers of fine-grained alluvial sediment inside the casket with the remains, which indicates that water infiltrated and receded multiple times since the container was placed in the ground. This water activity likely accounts for some or all of the observed differential dislocation of remains for these five individuals. It is also possible that these individuals may have been buried under similar weather conditions (i.e., substantial rain events occurred shortly after, but not immediately after, interment).

Beyond movement of remains from fluvial activity, another postdepositional force affecting these burials is casket collapse, which was noted by archaeological excavators for the graves of most of the exhumed individuals. When the wood boxes containing these individuals degrades over time, the structural integrity of the container begins to fail—particularly under the weight of the overlying soil. As was noted with Burial 84 above, artifacts that are in the shaft fill above the grave can drop into the collapsed container and inadvertently become co-mingled with the skeletal remains—giving the false impression of associated personal effects. Details observed during the excavation process and the precise position of artifacts and human remains in relation to one another are critical to distinguishing between objects that are intentionally buried with an individual versus those that are intrusive. Skeletal remains inside the casket may also become damaged as a result of collapse. Such impacts are distinctive compared to damage that may be caused by blunt force trauma, which is discussed further in the osteological report (Chapter 5).

Summary

The 2022-2023 field seasons at Oaklawn Cemetery resulted in the recovery of 16 sets of remains from 15 burials in Section 20, also known as the Black Potter's Field. All exhumed individuals were interred in simple wooden containers; one was a repurposed crate and the others were unadorned caskets that were likely manufactured locally at/near the time of use. Specific characteristics of almost half of the burials and their context (Burials 42, 45, 65, 84, 95, 119, 124) could demonstrate some form of disrespectful treatment in burial practices. Two of these individuals (Burials 42 and 65) show signs of trauma. Eleven males in simple wooden caskets meet two of the criteria for the documented Massacre victims, while Burial 42 meets all of the expected traits.

Burial 42 stands out among all the exhumed individuals in terms of his cause of death (gunshot wound), the condition of his remains (bloated state of decomposition and missing right foot), burial in an expedient container, and the fact that whomever buried him did not remove his clothes or personal effects. Dr. Stubblefield proposes (Chapter 6) that he is perhaps Eddie Lockard, whose remains were discovered on June 4, 1921—days after the

Massacre—which would fit with the details observed for Burial 42 from the archaeological excavation process and results of the detailed analyses of the container and associated artifacts.

The spatial distribution of Burial 42 and other burials that fit or approximate our target profile or are otherwise of archaeological interest lie entirely within the southern relict stream channel or along the edges of it (Figure 4.2). Burials that lie uphill on the terrace to the north of the stream channel are part of the Old Potter's Field (Figure 2.13) and likely predate the Massacre. Burials documented south of the channel likely post-date the Massacre. This does not preclude the possibility of victims being buried outside of the relict stream channel, but it does provide some sense of the areas where we are most likely to encounter graves from 1921.

Osteological analysis of the 16 sets of fully exhumed remains is presented in the following chapter. Note that an additional Burial (#99) is also discussed in Chapter 5, though only the cranium was removed to the forensic lab for evaluation. The resulting documentation was partial in nature but sufficient for Dr. Stubblefield to exclude her from further consideration as a Massacre victim. Chapter 6 presents a summary of our overall findings and recommendations for additional fieldwork and continued forensic analysis.

CHAPTER 5

THE TULSA RACE MASSACRE INVESTIGATION REPORT OF OSTEOLOGICAL EXAMINATIONS IN THE 2022 AND 2023 FIELD SEASONS

Phoebe R. Stubblefield, Ph.D.

In two field seasons, the first spanning October to December 2022, and the second from September to October 2023, osteological examinations were conducted on individuals exhumed from Section 20 of the Oaklawn Cemetery (Figure 5.1), in Tulsa Oklahoma, 1133 E 11th St, Tulsa Oklahoma, 74120. These excavations were a continuation of the search in this area begun in June 2021 for victims of the 1921 Tulsa Race Massacre (TRM) who were interred in this cemetery.

These excavations were contracted by the City of Tulsa, and conducted by the University of Oklahoma (OU) Archeological Survey, with contract assistance from Stantec Inc., formerly Cardno, Inc. The 2022 search area has been previously referred to as the "Original 18" location due to the newspaper documentation of eighteen Black male burials (Figure 5.2). Readers are referred to our previous report, "Archaeological and Forensic Research in Support of the 1921 Tulsa Race Massacre Graves Investigation: The 2020-2021 Field Seasons at Oaklawn

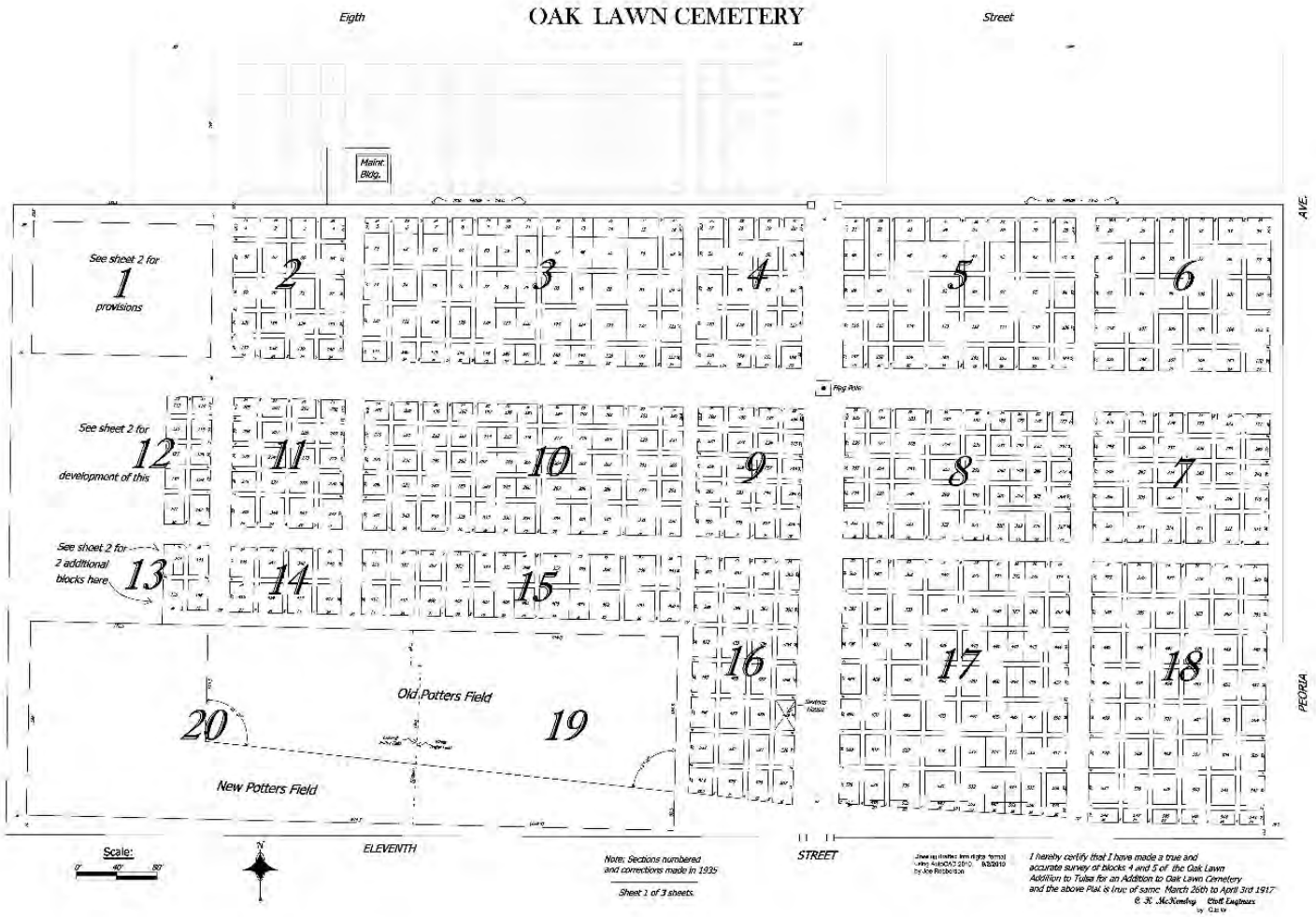
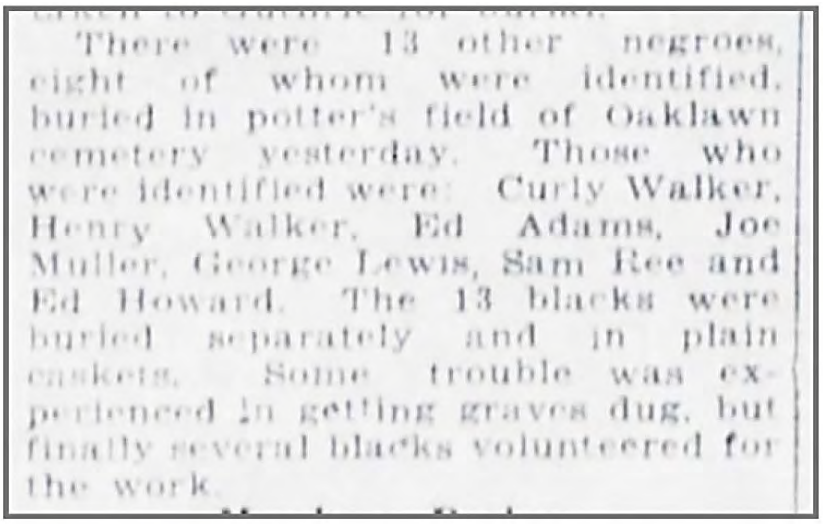


Figure 5.1*. 1914-1917 plat map of Oaklawn Cemetery.*

Cemetery" (Stackelbeck and Stubblefield 2022). Additional background information on the Oaklawn site, and the history of its relevance to this investigation, is contained there.

In the 2022 field season the search for victims continued in the Original 18 area, beginning with collecting additional samples from the burials reinterred in 2021. This step was necessary because the previous samples did not yield sufficient DNA. Burials 01, 13, 15, 17, 19, 27, and 28 were accessed for additional samples, which were submitted to our DNA and genetic genealogy colleagues, Intermountain Forensics (Figures 5.3, 5.4 and 5.5; Table 5.1)

Forensic analysis was conducted



There were 13 other negroes, eight of whom were identified, buried in potter's field of Oaklawn cemetery yesterday. Those who were identified were: Curly Walker, Henry Walker, Ed Adams, Joe Muller, George Lewis, Sam Bee and Ed Howard. The 13 blacks were buried separately and in plain caskets. Some trouble was experienced in getting graves dug, but finally several blacks volunteered for the work.

Figure 5.2. *Clipping from the Morning Tulsa Daily World 3 June 1921, indicating identified male decedents buried in the potter's field of Oaklawn Cemetery.*

Figure 5.3. *Additional DNA samples sealed for submission for Burials 01, 13, 19, and 27.*

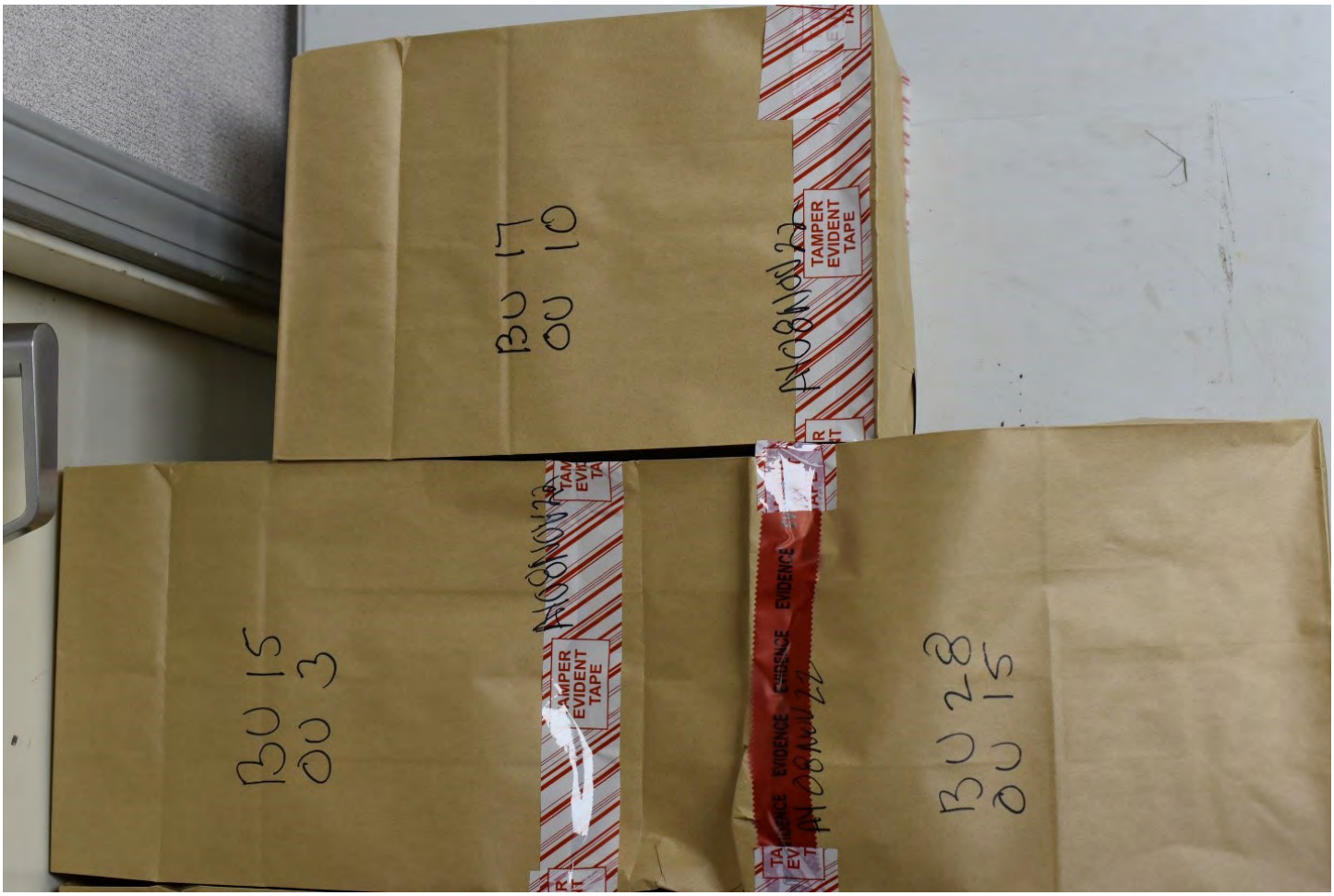


Figure 5.4. *Additional DNA samples sealed for submission for Burials 15, 17, and 28*

Figure 5.5. *Community prayer led by Dr. Goss, recognizing the individuals re-interred after additional DNA sampling.*

Table 5.1. Additional Samples from the 2021 Exhumations Submitted for DNA Analysis.

Burial Number	Elements Retrieved and Submitted
1	8 teeth, femoral fragments
13	11 teeth, 1 femur
15	23 teeth, 1 femur
17	8 teeth, 1 femur
19	10 teeth, 1 femur
27	29 teeth, 1 femur
28	1.5 teeth, 1 femur

from November 2022 into January 2023, for eight (8) individuals (Figure 5.6) exhumed from plain caskets. Our selection parameters for exhumation derived from the 1921 newspaper accounts and death certificates, which described decedents with the following characteristics:

1) male biological sex
2) burial in plain casket
3)evidence of gunshot wounds and/or thermal damage

Where preservation made determination of biological sex uncertain, individuals in plain caskets were exhumed even if appearing feminine, in order to include potential young male decedents. As in the 2021 season, remains were exhumed and placed into cardboard cremation trays, then escorted by Greenwood community

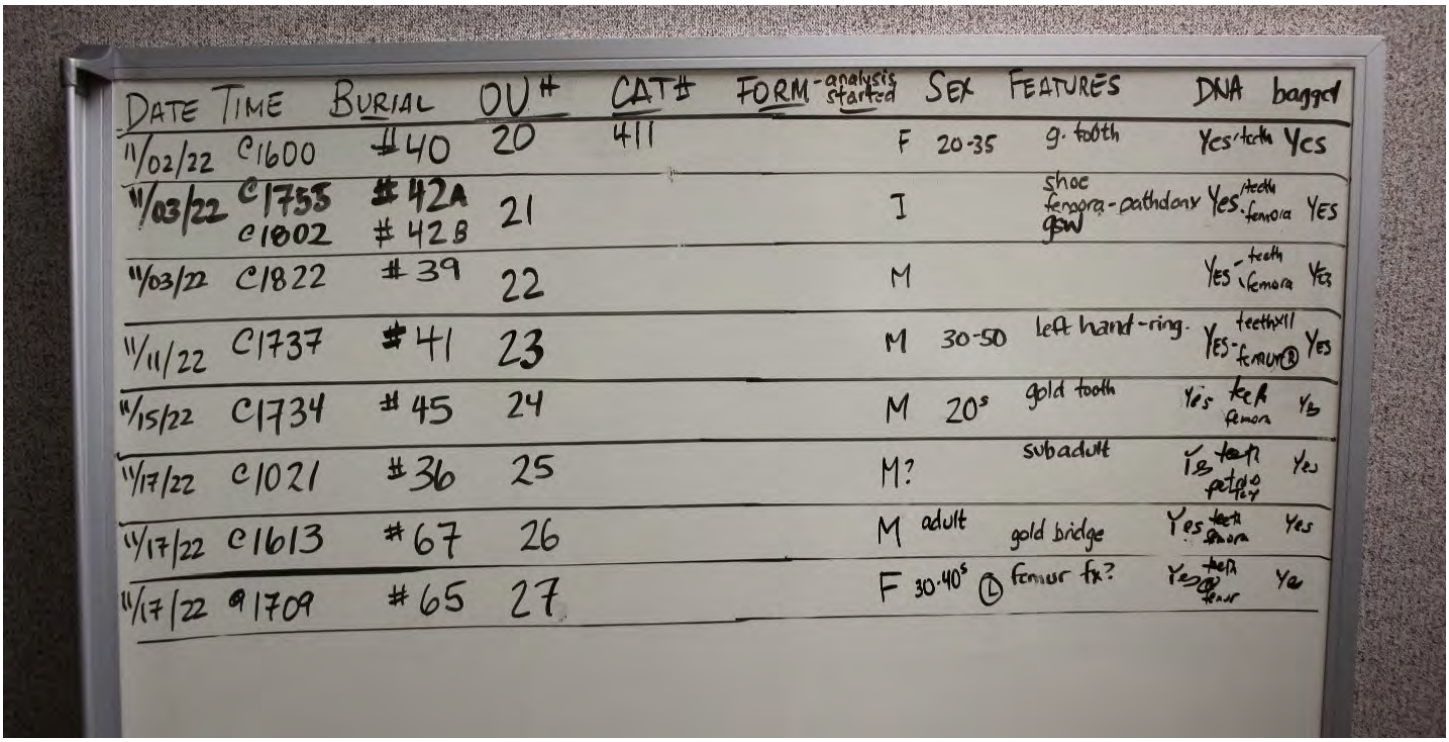


***Figure 5.6**. Laboratory intake board summarizing analytic processing and findings for individuals exhumed during the 2022 field season.*

members and investigation personnel to the onsite field laboratory located in Section 1, in the northwest corner of Oaklawn Cemetery.

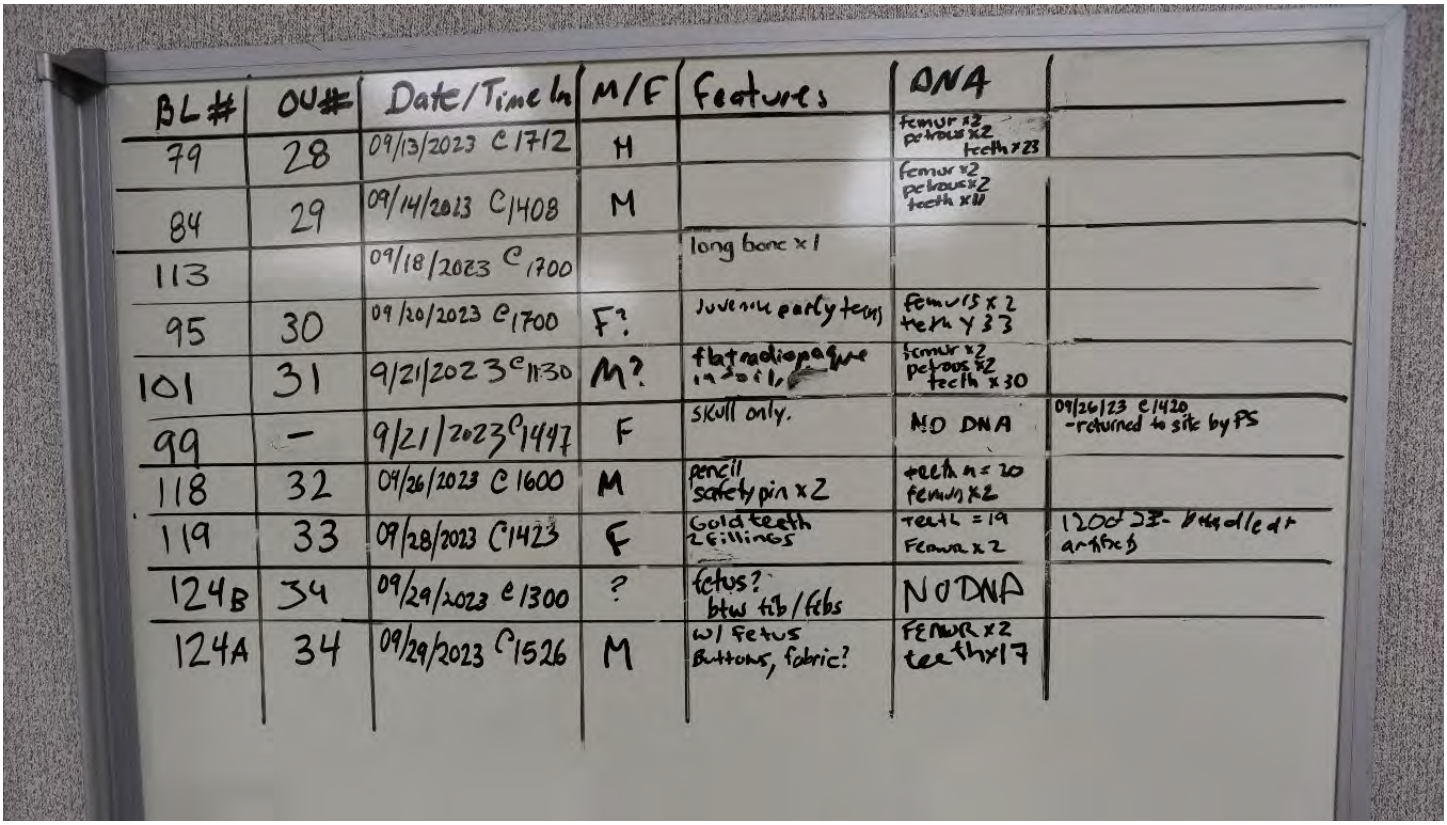
Sadly, we lost one of our best community participants, James Kavin Ross, who passed on May 8, 2023. He was an active collaborator and inspiration on every level of our investigation, from the mayor's office, to the Greenwood community, assisting with the excavations and escorting the exhumed individuals to the laboratory, constantly imaging the activities of our investigatory community to restore the TRM victims. Kavin is missed, but we remain inspired by his energy and spirit of unity to restore the TRM victims to community and history. In recognition of his request to do so, in the 2023 season we included the Tulsa city flag as part of our memorial drape in respect to these decedents who were participants in the TRM investigation (Figure 5.7).

Figure 5.7*. Draping of the Burial 79 remains with the Tulsa city flag, in recognition of James Kavin Ross's request. Pinning the drape from left are Brenda Nails Alford, Kary Stackelbeck, and Phoebe R. Stubblefield.*

The 2023 field season excavation area expanded to include the location known as the Clyde Eddy area. This was a location in the eastern end of Section 20 that Dr. Stubblefield visited in 2005 with Mr. Eddy (Figure 5.8), who claimed witnessing victim burials in Oaklawn on June 2nd 1921. In this season ten individuals were examined or exhumed (Figure 5.9).

Dedication to restoring the victims of the Tulsa Race Massacre is demonstrated in the continuity of effort shown by the personnel serving in this investigation. Most anthropologists and community members from the 2021 investigation returned for the 2022 and 2023 seasons (Figures 5.10, 5.11, 5.12). The following individuals generously contributed their time, energy, and courage to participate in the forensic anthropology laboratory and to escorting the decedents:

Figure 5.8. *Site visit with Mr. Clyde Eddy and his family, to Oaklawn Cemetery, March 4, 2005.*



BL#	OU#	Date/Time In	M/F	Features	DNA	
79	28	09/13/2023 C1712	M		femur x2 petrous x2 teeth x23	
84	29	09/14/2023 C1408	M		femur x2 petrous x2 teeth x11	
113		09/18/2023 C1700		long bone x1		
95	30	09/20/2023 C1700	F?	Juvenile early teens	femurs x2 teeth x33	
101	31	9/21/2023 C1130	M?	flat radiopaque [illegible]	femur x2 petrous x2 teeth x30	
99	–	9/21/2023 C1447	F	skull only.	NO DNA	09/26/23 C1420 -returned to site by PS
118	32	09/26/2023 C1600	M	pencil safety pin x2	teeth n=20 femur x2	
119	33	09/28/2023 C1423	F	Gold teeth 2 fillings	teeth =19 Femur x2	1200 [illegible]
124B	34	09/29/2023 C1300	?	fetus? btw tib/fibs	NO DNA	
124A	34	09/29/2023 C1526	M	w/ fetus Buttons, fabric?	FEMUR x2 teeth x17	

Figure 5.9. *Laboratory intake board summarizing findings for individuals exhumed during the 2023 field season. .*

***Figure 5.10**. Transport of remains from Burial 41 to the forensic laboratory, Dr. Rodney Goss, presided at front right. Clockwise from Dr. Goss, the bearers were Phoebe R. Stubblefield, Aaron Young, Armando Anzellini, James Matthew Ross, and our late Public Oversight Committee Chair James Kavin Ross.*

***Figure 5.11**. A few of the forensic anthropologists serving in the 2022 and 2023 field seasons: clockwise from left Aaron Young, Arion Mayes, Angela Berg, Carlos Zambrano, and Phoebe R. Stubblefield.*

Figure 5.12. *James Kavin Ross, after a day of assisting us (Angela Berg at left, Phoebe Stubblefield at right) in the laboratory in 2022.*

Phoebe R. Stubblefield, Ph.D., University of Florida, Director of the C.A. Pound Human Identification Lab
Angela Berg, M.A., Forensic Anthropologist, Oklahoma Office of the Medical Examiner
Arion Mayes, Ph.D., Associate Professor, Co-Director of the Biological Anthropology Lab, San Diego State University
Carlos Zambrano, Ph.D., Forensic Anthropologist, Oklahoma Office of the Medical Examiner
Sydney Garcia, M.A., Forensic Anthropology Postgraduate Research Associate
Aaron Young, M.A., University of Arizona Graduate Student
Sara Getz, Ph.D., Forensic Anthropologist, Oklahoma Office of the Medical Examiner
Kate Spradley, Ph.D., Forensic Anthropologist and Professor, Texas State University
Jessica Cerezo-Roman, Assistant Professor, University of Oklahoma
Robert Pickering, Emeritus, University of Tulsa
Kendra Smith, University of Florida

<u>Members of the Public Oversight Committee and Tulsa Communities:</u>
Brenda Nails-Alford, former Public Oversight Committee Chair
James Kavin Ross, late and beloved Public Oversight Committee (POC) Chair
Michael Reed
Jack Henderson

Dr. Rodney Goss
Reverend Dr. Marlin Lavanhar
Reverend Randy Lewis

Graduate Student Assistants:
Sheridan Lea, University of Florida
Megan Walsh, University of Oklahoma

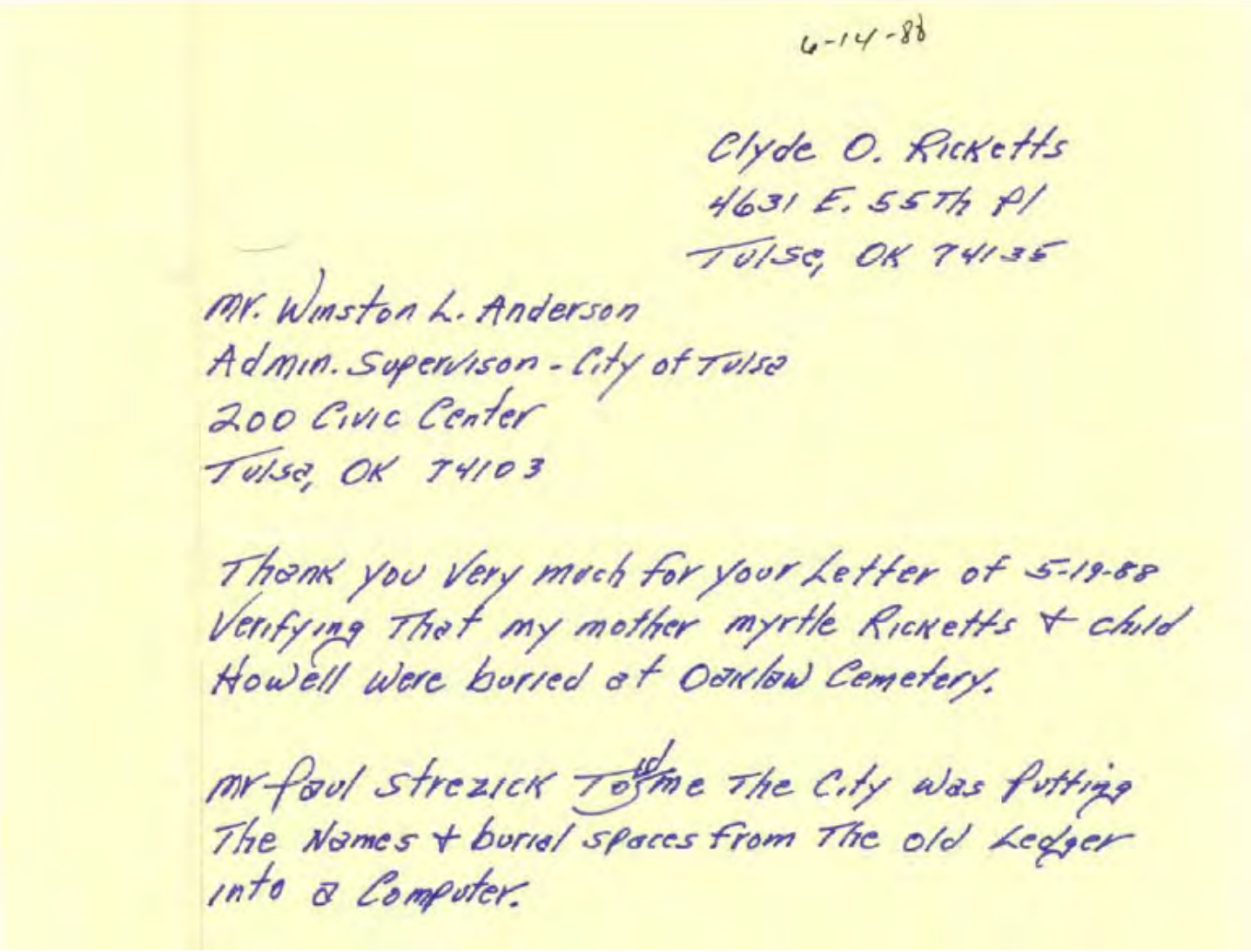
Forensic anthropologists Angela Berg acted as liaison to the Oklahoma Medical Examiner's Office, and contributed to the skeletal analysis, scene documentation, and historical record search. Robert Pickering contributed to the historical record searches described below, especially by interpreting the many handwritten death certificates. Arion Mayes was an invaluable contributor to the skeletal analysis, especially documenting dental traits and analysis of skeletal traits when working with poorly preserved remains. Aaron Young and Sydney Garcia contributed broadly, from skeletal analysis to assisting as bearers when escorting exhumed individuals from the burial site to the laboratory. Jessica Cerezo-Roman contributed non-metric trait analysis. Brenda Nails Alford and the James Kavin Ross were constant participants in the lab and in the excavations, assisting in the transport of exhumed individuals and in preparing remains for analysis and reburial. Carlos Zambrano and Sara Getz traveled repeatedly from Oklahoma City to to contribute countless hours to skeletal analysis of these potential victims. Kate Spradley joined us in 2023 and contributed generously to skeletal preparation and analysis. Kendra Smith also joined in 2023, and kept the laboratory organized and our records current. To any overlooked in the list above, your effort was appreciated and valued; please correct this oversight to be included in the next report.

Collateral Historical and Geneaological Research

As demonstrated in our 2021 report, the PIC's search for the Tulsa Race Massacre victims has included reconstruction of the history of the cemetery. After the July 2021 field season during which Stubblefield, Angela Berg, Robert Pickering, Brenda Nails-Alford, and Jennifer Dewey attempted to reconcile the boundaries of Section 20 with the spreadsheet records in our possession, a need to map the marked graves in Section 20 became apparent. The headstone map reconstructs the lost data and City records, and may demonstrate a pattern of insertion of burials. Section 20 has many marked graves; only those of a few veterans are recorded in the current City records.

In December 2022 Stubblefield submitted a public record request to the City of Tulsa Clerk for any records pertaining to the use or financing of Oaklawn cemetery, from cityhood until 1930. The clerk provided many cemetery records already in the possession of the investigation team, but in addition located a digital spreadsheet that recorded the headstones in Section 20. Although there was no date for this spreadsheet data, the spreadsheet included headstones, row numbers, and occasional grave numbers that were not recorded in other City documents or the 1985 Girl Scout survey (Hawkins 1985). Based on a letter (Figure 5.13) included in the Oaklawn cemetery ledger, in 1988 the City was digitizing cemetery records, and this effort may be the source of the spreadsheet data. Unfortunately, the spreadsheet did not include the burial locations of the Tulsa Race Massacre victims buried in unmarked graves, but it has provided corroboration of certain marked burial locations in Section 20.

Using this Section 20 grave marker survey, the PIC proceeded to document the location of the visible headstones, and to pursue historical records for those burials. The headstone survey is described in Chapter 2 of this report. The historical record search has been in collaboration with the genealogists from Intermountain Forensics (IF). The IF genealogists work to reconstruct histories of the marked burials and reconstruct the genetic genealogies of the exhumed decedent participants.



6-14-88

Clyde O. Ricketts
4631 E. 55th Pl
Tulsa, OK 74135

Mr. Winston L. Anderson
Admin. Supervison - City of Tulsa
200 Civic Center
Tulsa, OK 74103

Thank you very much for your Letter of 5-19-88
Verifying That my mother myrtle Ricketts & child
Howell were buried at Oaklaw Cemetery.

Mr Paul Strezick Told me The City was putting
The Names & burial spaces from The old Ledger
into a Computer.

Figure 5.13. *Excerpt from letter stored in the Oaklawn Ledger, referencing computerizing the records. The date written at the top is assumed to have been added by a City employee.*

Osteological Examinations Procedural Notes

The following sections of this chapter are the osteological findings for the burials exhumed or examined in 2022 and 2023, reported in order by burial number. Summary data can be found in the tables at the end of the chapter. Readers will notice variation in reporting between the years: the abbreviation BU was used in 2022 analytical notations, while in 2023 we returned to the BL designation. All remains were bundled for reburial, although images for those bundles are only included for the 2023 season. At the end of the 2022 and 2023 field seasons, to avoid the problems with resampling experienced with the 2021 exhumations, the bundled remains were transferred to on site secure cemetery storage (Figure 5.14) pending results of the DNA analysis.

As in the 2021 report, most of the vocabulary used in these reports will be accessible to individuals with knowledge of human skeletal anatomy, although in this report more effort has been made to use common vocabulary for certain bones, such as using lower leg bones in place of tibia and fibula. More effort has gone to describing interesting teeth by location and using common terms (e.g., incisor, canine, premolar, molar), but the numbering system is also used in this report. The Universal Numbering System, which numbers the adult dentition from 1 to 32, starting with the right upper back molar, heading left, down to the lower left back molar, then returning to the right, is used for the dental inventory. Description of teeth, such as for the presence of a carie (cavity) or restoration (a filling, crown, or other technique for restoring function to a tooth), might refer to the

***Figure 5.14**. Secure storage of the transport trays holding bundled remains pending reburial.*

universal number and the tooth name (molar, premolar, canine, incisor) and location. Anthropologists refer to the premolars as numbers 3 and 4, such as the "upper left fourth premolar". Anthropological molars occur as first, second, and third, from front to back (i.e., wisdom teeth are third molars).

The Summary and Opinion section of each burial analysis will contain language that is more generalized and hopefully accessible to a broad readership.

Process

The decedent participants were recorded into the laboratory information management system based on burial number. The burial number documents the presence and order of burial features as encountered, but does not represent excavation of the burial. Table 5.2 lists the burials exhumed for laboratory analysis. The exhumed remains received an Oaklawn Unknown number (OU#). The remains are unknowns because the burials targeted by our mission and exhumation notice were in locations that had no headstones or footstones.

The Burial Number was photographed in association with the skeletal remains during excavation and analysis. Exhumed remains were moved by hand, either as isolated skeletal elements or in blocks of soil, into cardboard cremation trays (Starmark EZ-Fold™), which were internally and externally labeled with the burial and unknown designators. After covering with a cot drape, the exhumed remains were escorted to the lab by a team of Tulsa and Greenwood community representatives and anthropologists.

Upon arrival to the lab, remains were photographed, radiographed, inventoried, and examined for areas of further analysis. When radiopaque features were noted on the radiographs, the skeletal remains received additional

Table 5.2. Burials Exhumed or Examined in 2022 and 2023 Resulting in an Osteological Report.

Burial Number	Oaklawn Unknown Number	Date Escorted to Lab
36	25	17-Nov-22
39	22	3-Nov-22
40	20	2-Nov-22
41	23	11-Nov-22
42	21	3-Nov-22
45	24	15-Nov-22
65	27	17-Nov-22
67	26	17-Nov-22
79	28	13-Sep-23
84	29	14-Sep-23
95	30	20-Sep-23
99	36	21-Sep-23
101	31	21-Sep-23
118	32	26-Sep-23
119	33	28-Sep-23
124A	34	29-Sep-23
124B	35	29-Sep-23

radiographs, cleaning and/or reconstruction to enable identification of the radiographic feature and to improve documentation and analysis of the associated skeletal area.

Features that would be individualizing in a modern forensic examination, such as dental restorations, dental modifications, skeletal evidence of disease processes, healed fractures in any location, signs of parturition (childbirth), or atypical anatomy, were cleaned, reconstructed, and documented when possible.

Ancestry Determination

Each adult skeleton was assessed for indicators of ancestry. The goal of ancestry assessment is to acquire information that may lead to identification and reconnection of a decedent to his or her family. In the modern forensic context, that means that race terms have meaning if the decedent or the decedent's family used race terms to form the identity. The vocabulary of ancestry analysis in the forensic context commingles concepts of "race" and "ancestry." Forensic anthropologists differ on the use of race and ancestry terminology. Dr. Stubblefield defines race as a population label that in the mind of the user combines biological, social, and behavioral concepts.

The concepts may not necessarily be shared by the user and the target of the term. The concepts also may not be stable between uses and through time. Dr. Stubblefield uses the term "ancestry" to indicate the biological relationships of recent geographic populations, including African, European, and Asian.

We assessed both morphological (shape) and metric (measurement) data for indicators of relationship. In the manner that one expects to resemble his or her cousins, the underlying cranium supports that expectation by having physical features of resemblance. Those physical features may be observable or measurable. In the current context, we strove to avoid making one-trait ancestry determinations, despite the temptation to do so in the presence of relatively poorly preserved remains. If preservation was too limited to provide multiple morphological characters when metric analysis was unfeasible, we designated ancestry as indeterminate.

Whenever possible, we used metric analysis to estimate ancestry, relying on the statistical package Fordisc (Jantz RL and SD Ousley, 2005). Preservation during the 2022 and 2023 field seasons made metric analysis of ancestry generally unfeasible, although it was useful for stature estimation. We encourage the reader to the References below for the technical details. Fordisc is software that utilizes several databases of skeletal measurements to generate statistics on race, sex, and stature. The analyst using Fordisc is aware that the function must produce a result, and that the result must then be interpreted. Fordisc results consist of a population assignment, then numerical values of posterior probability and typicalities F, Chi, and R. In this TRM Investigation report, we provide the posterior probabilities and summary typicalities and interpret them in the context of an allegedly sorted burial cohort (individuals buried in the Colored Potter's Field). We are operating under an assumption that a pre-sort has occurred, in that those selected for burial in this location would have identified, or been identified, as Black. However, the lack of burial records for Section 20 leaves room to hypothesize that race designation for this section was flexible.

Genetic Sampling

At the opening of the 2022 season, the Physical Investigation Team endeavored to reopen the vaults of 14 adults that needed more DNA samples. Due to time constraints, the team elected to obtain samples from the most accessible adults, with a focus on the male decedents when available. As a result, seven of the 2021 adults were re-sampled, not including all eligible male burials. Male burials #9 (OU# 17) and #29 (OU# 16) should be considered for re-sampling if the burials are accessible in future excavations. The decedent in burial #30 had a metastatic disease state at the time of death, and therefore was not accessed for resampling in this field season due to being an unlikely race massacre victim. The DNA analysis is conducted by our colleagues Intermountain Forensics of Salt Lake City, UT.

After the skeletal examination was completed, all unrestored teeth lacking cavities, and one or both femurs if the shaft was sufficiently intact, were submitted as DNA samples. If preservation was so poor that femurs were too fragmentary, the petrous temporals were submitted. The samples were transferred in two boxes to Intermountain Forensics via Fedex (tracking #817719749715 and 817719749704) on 23 Jan 2023.

Condition of Remains

General features shared by all of the exhumed remains are described here. Specific observations are presented in the individual burial analysis sections.

As in our previous season, pre-exhumation views indicated that the skeletal remains derived from articulated body burials in individual graves. The dried bones were earth-stained to a deep brown color and very fragile. Preservation was poorer than in the previous season, as demonstrated by a higher degree of fragmentation for the large bones and crania. There was no odor of decomposition. There were few personal effects. The usual artifacts were safety pins near the head and hip, derived from the burial shroud.

Elements useful for indicators of ancestry, age, and sex, particularly the skull, femora, and humeri, were reinforced with a solution of consolidant (20g Butvar ® B-98 powder dissolved in 16 oz. of 70% ethanol) if they appeared relatively present or relatively intact prior to exhumation. Approximately half of the burials were wet-sieved in the laboratory in an attempt to preserve structures, especially the pubic symphyses.

Inventory of the skeletal remains in each burial was performed by type of skeletal element instead of by individual bone, unless preservation allowed for specificity.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 36
OAKLAWN UNKNOWN NUMBER: 25
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 560-563, 646, 647

Condition of Remains. In situ, the cranium was observed as a partially intact dome during initial excavation (Figure 5.15) and was treated with Butvar 98; however, the vault continued to collapse during excavation. The left femoral shaft was also treated with Butvar 98. These skeletal remains were fragmentary (Figure 5.16) upon arrival in laboratory. The bone preservation was poor; the cranial and long bone fragments were thin. The long bones presented as linear shards and flakes infiltrated with plant roots, and the dental enamel was actively flaking. Visual and radiographic inspection did not reveal hand or foot elements.

Radiographs revealed two safety pins, one of which was recovered (Figures 5.17 and 5.18). The safety pins were present in the typical locations for burial preparation, i.e., in the cervical and pelvic regions. Multiple nails were also observed.

Number of Individuals. One (1) individual was represented by these remains.Despite or due to the poor preservation, no duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

Visual inspection and radiography indicated fragments from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left humeri
teeth #1-7, 9,10,12-32	right and left femora
right and left ribs	right and left tibiae

[SENSITIVE CONTENT]

***Figure 5.15**. In situ overview of the BU 36 remains, showing very poor preservation. The white coloration is from Butvar 98, a preservative.*

[SENSITIVE CONTENT]

***Figure 5.16**. Overview of the Burial 36 remains after transport to the forensic laboratory.*

[SENSITIVE CONTENT]

***Figure 5.17**. Radiograph of thoracic structures from Burial 36. Nails and a safety pin are visible.*

Figure 5.18. *Burial 36 Safety pin recovered during the cleaning process.*

Sex. The sex of this individual is indeterminate, due primarily to the poor preservation. No long bone epiphyses, pelvic components, or sufficient cranial components were preserved. In addition, this individual may have been pre-pubertal, making sex estimation unreliable. See "AGE" below for more information.

Initial DNA analysis by Intermountain Forensics indicated that this individual was male.

Ancestry. Ancestry was not estimated, due to poor preservation of the cranial elements. Race is likely to be "Colored" or "Black", as this individual was recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was a subadult or early teenager. The root on the right lower second molar (tooth 31) was preserved, and possessed incomplete radices and open apices (Figure 5.19). The third molars (teeth 1, 16, 17, and 32) were encrypted and had yet to develop roots. No deciduous teeth were recovered. Age is estimated at 12.5 to

[SENSITIVE CONTENT]

Figure 5.19. *Image of the Burial 36 second molar (tooth 31) showing open apices.*

15.5 years based on the London Dental Atlas standards (AlQahtani 2010).

Stature. Stature was not estimated, due to the fragmentary state of these remains. No sufficiently intact long bones were recovered.

Individualizing Traits or Anomalies. No individualizing traits or skeletal anomalies were observed in these remains poorly preserved remains.

Antemortem or pathological conditions. No antemortem or pathological conditions were observed in these fragmentary remains.

Perimortem Trauma. No perimortem trauma, or trauma associable with a cause of death, was observed.

Postmortem Damage. No extraordinary postmortem damage was observed. The thin cortical and cranial bone quality is consistent with a juvenile individual, and the burial environment contributed to fragmentation.

DNA Sampling. The right and left petrous temporals and the entire recovered dentition (thirty teeth) were submitted for analysis (Figure 5.20).

Summary of Conclusions and Opinions. A male, based on DNA analysis, ranging in age from 12 to 15, was recovered from Burial 36. This individual may have identified as Colored or Black, since he was recovered from the Colored Potters Field. Very little life history information was available due to the poor preservation of all elements. All of the recovered dentition and the petrous temporals were submitted for DNA analysis, which may provide additional identifying information if sufficient DNA is available. As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

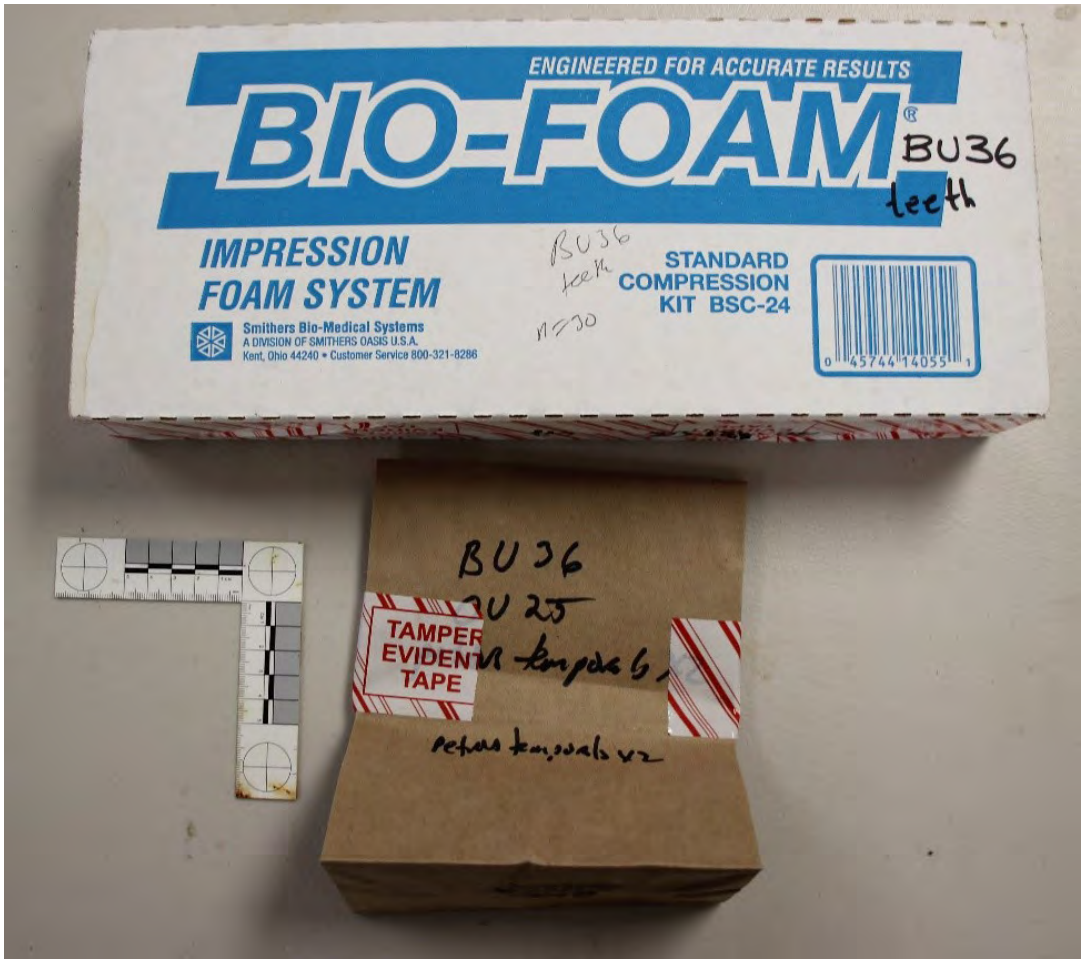


***Figure 5.20**. The Burial 36 right and left petrous temporals and the dentition sealed and submitted for DNA analysis.*

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 39
OAKLAWN UNKNOWN NUMBER: 22
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 444, 445, 453, 456, 457, 471-473, 475

Condition of remains In situ these remains appeared predominately in anatomical position, with obvious damage to the cranium and pelvic girdle (Figure 5.21). The remains were friable and fragile. Upon arrival to the laboratory, the skeletal elements were fragmentary (Figures 5.22 and 5.23). The long bones and cranium were in large fragments. Fragments of wood and nails, consistent with coffin burial, were present with the remains, and several large rocks were recovered from beneath the remains. The remains were moved into the transport container on metal sheets, and transported within soil blocks in order to limit further fragmentation.

A dark blue/purple colored fabric fragment was recovered from the anterior cervical/clavicles area (Figures 5.24 and 5.25). A rivet or grommet was recovered from the soil inside the cranium (Figure 6.26)

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After visual and radiographic inspection, representatives from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left ulnae
teeth #1, 27, 28, and 32.	right and left radii
right and left ribs	right and left os coxae
cervical, thoracic, and lumbar vertebrae	right and left femora
right and left scapulae	right and left tibiae
right and left clavicles	right and left fibulae
right and left humeri	manual and pedal elements

Sex: This individual is a biological male, based on observation of the preponderance of morphological traits. The following features, consistent with male biological sex, were observed in these remains: a narrow sciatic notch, a well-developed nuchal crest, and well-developed muscle markings on the humeri and femurs. The right mastoid process was partially available, and its breadth indicated a probable male designation.

[SENSITIVE CONTENT]

***Figure 5.21**. In situ overview of the Burial 39 remains.*

***Figure 5.22**. Upper body overview of the Burial 39 remains after transport to the forensic laboratory.*

***Figure 5.23**. Lower body overview of the Burial 39 remains after transport to the forensic laboratory.*

Figure 5.24. *Burial 39 Dark blue/purple colored fabric recovered during the cleaning process.*

Figure 5.25. *Closer view of the Burial 39 dark blue/purple colored fragment recovered during the cleaning process.*

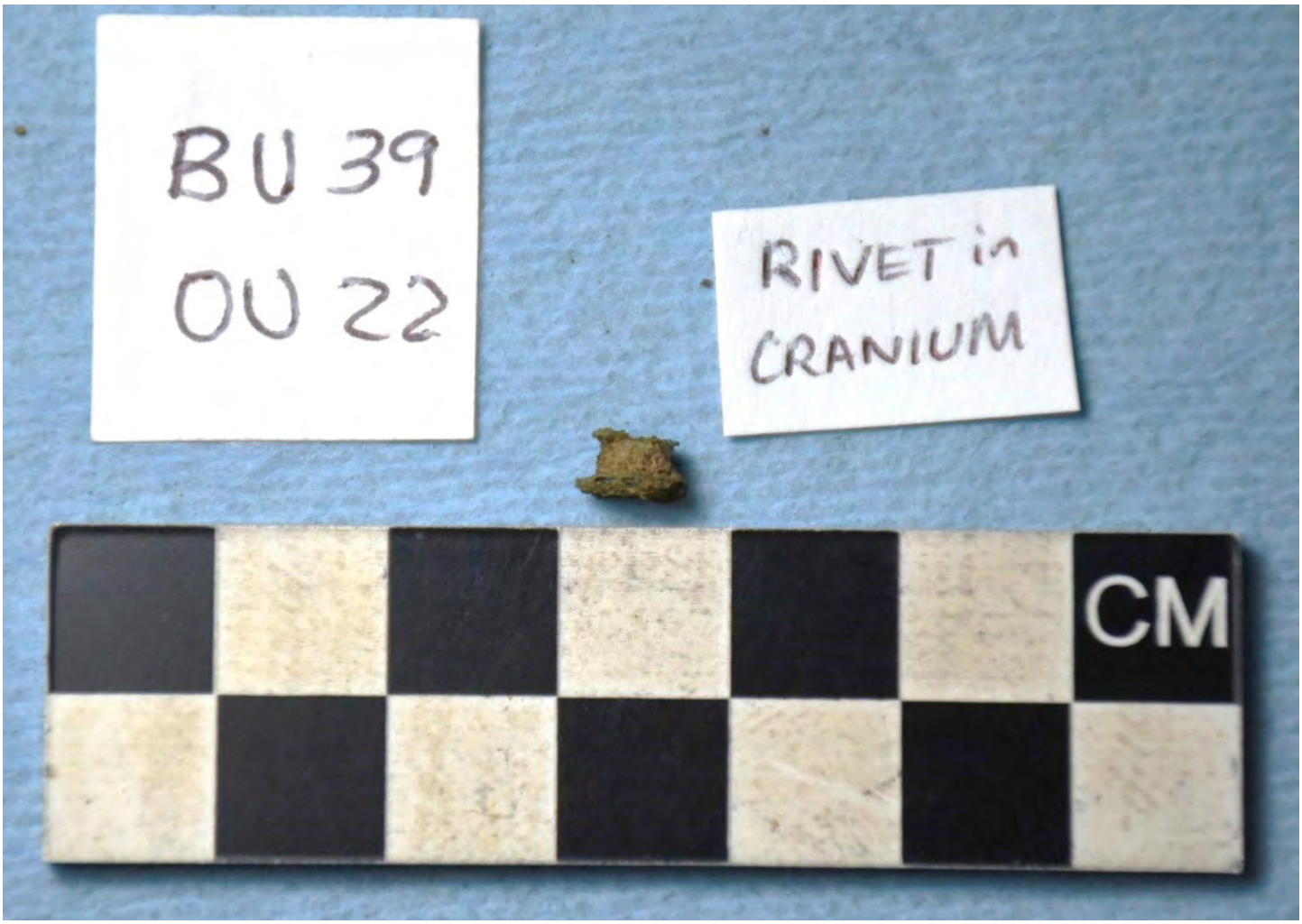


***Figure 5.26**. A rivet recovered from the inside of the Burial 39 cranium.*

Initial DNA analysis by Intermountain Forensics confirmed male biological sex.

Ancestry. Ancestry was not estimated, due to poor preservation of the cranium. The facial cranium was crushed, making metric and morphological analysis unavailable. Race is likely to be "Colored" or "Black", as this individual was recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This man was estimated to be middle aged. Based on assessment of the left pubic symphysis (Figure 5.27), the morphology was consistent with phase 4 of the Suchey-Brooks technique (Brooks and Suchey 1990), which has a mean age of 35.2 year and a 95% confidence interval age range of 23 to 57 years. According to the Todd technique (1921) the morphology was consistent with phase 7, which has an age range of 35 to 39.

While the pubic symphysis techniques provide a mean age in the thirties, arthritic development in the cervical and thoracic vertebral bodies, the medial clavicle, and femoral head, support the overall age estimate of middle aged, the upper end of the Suchey-Brooks phase.

Stature. Stature was estimated from the intact left clavicle. Using the Fordisc (v3.1.322) 19th Century Black Male sample, this man's stature was 61.1 to 69.8 inches (65.4 +/- 4.4). The formula used was 0.21440 * CLAXLN (148 mm) + 33.69 inches.

Individualizing traits or anomalies: This man was primarily edentulous, especially for the anterior teeth. Four (4) teeth were recovered, specifically the right upper and lower third molars, the right lower canine, and the right lower third premolar (Figure 5.28). The anterior portion of the mandible was resorbed consistent with antemortem tooth loss (Figure 5.29).

[SENSITIVE CONTENT]

***Figure 5.27**. The surface of the Burial 39 left pubic symphysis.*

[SENSITIVE CONTENT]

***Figure 5.28**. Occlusal view of the four teeth recovered for Burial 39.*

[SENSITIVE CONTENT]

Figure 5.29. *Overhead view of the Burial 39 edentulous anterior mandible.*

As noted above, fabric was recovered from the anterior neck area, and a grommet was found in the soil in the cranium. This grommet may have been in the fill dirt for the burial, and may not be associated with the decedent.

Antemortem or pathological conditions. Arthritic changes are present, observed in lipping on joints throughout the skeleton, including the right radius and ulna, the right fovea capitis (Figure 5.30), and bridging of the right sacro-iliac joint. This man was primarily edentulous as demonstrated by mandibular resorption and the low number of recovered teeth.

Perimortem trauma. No evidence of perimortem trauma or trauma associable with a cause of death was observed in these fragmentary remains.

Postmortem damage. No extraordinary postmortem damage was noted. As described above, the remains are earth stained and fragmentary. This damage is consistent with prolonged burial.

DNA sampling. Two (2) teeth and both femora were submitted for DNA analysis (Figure 5.31).

Summary of conclusions and opinions. The remains of the individual in Burial 39 was a male of middle-age. He had very few teeth in life, having four teeth recovered, only two opposing (upper and lower third molars). Edentulism is consistent with older age, but the observable arthritic development throughout the skeleton support the middle-age assessment. His stature was estimated to be 65.4 +/- 4.4 inches, based on length of the clavicle.

Burial artifacts associated with this individual included a dark blue/purple fabric fragment recovered from his neck area. This may have been a necktie or collar, but other fabric sources can be considered. A metal grommet

[SENSITIVE CONTENT]

Figure 5.30. *The fovea capitis, or central connection of the Burial 39 right femoral head, displaying a well-developed rim.*

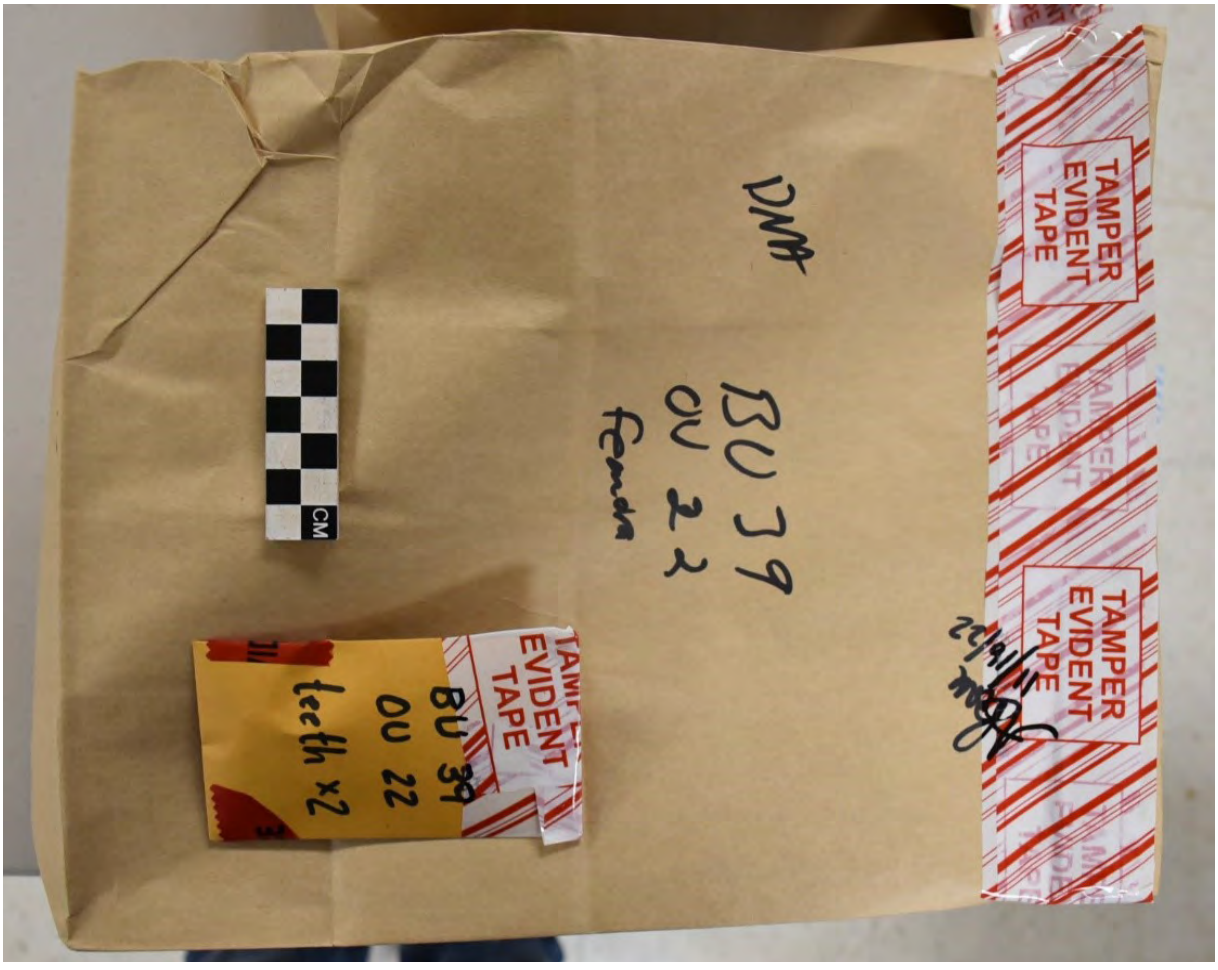


Figure 5.31. *Two (2) teeth and both femora from Burial 39, sealed and submitted for DNA analysis.*

was recovered from the soil in the cranium, but this small object is likely associated with the burial fill soil. As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 40
OAKLAWN UNKNOWN NUMBER: 20
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 401, 402, 406, 409, 411, 451, 452

Condition of remains. In situ, the remains in Burial 40 are predominately in anatomical position, although the left arm was not observed until exhumation (Figure 5.32). Exhumation and transport demonstrated that these remains were friable and fragile (Figures 5.33, 5.34 and 5.35). These skeletal remains were earth-stained and few large fragments were present. Long bone diaphyses were present as aligned linear shards, and epiphyses were rare. Remnants of wood and nails, consistent with a coffin, were recovered with the remains. Large, flat rocks were noted under the decedent, which may derive from the stream bed located in this section of the cemetery. In-situ, a gold tooth was observed, and the right hand was observed in a clenched position beside the pelvis.

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After visual and radiographic inspection, representatives from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left ulna
teeth #1-3, 6,7,9-11,15-18,22-29	right and left radius
right and left ribs	right and left os coxae
cervical, thoracic, and lumbar vertebrae	right and left femora
sacrum	right and left tibiae
right and left humerus	right and left fibulae
right patella	right and left manual and pedal elements

Sex. This individual was female, based on the preponderance of gracile morphological traits in this fragmentary assemblage. The overall skeleton was gracile (see Figure 5.32), in that relatively narrow long bone shaft diameters were observed. The orbital margins had relatively narrow breadths, and a wide sciatic notch was recovered (Figure

[SENSITIVE CONTENT]

***Figure 5.32**. In situ overview of the Burial 40 remains.*

Figure 5.33. *Upper body overview of the Burial 40 remains after transport to the forensic laboratory.*

Figure 5.34. *Mid-body overview of the Burial 40 remains after transport to the forensic laboratory.*

[SENSITIVE CONTENT]

***Figure 5.35**. Lower body overview of the Burial 40 remains after transport to the forensic laboratory.*

5.36). The right and left mastoid processes were short and here was a minimal nuchal crest. These features were consistent with biological females (Buikstra and Ubelaker 1994).

Initial results of DNA analysis by, Intermountain Forensics confirmed biological female sex for this individual.

Ancestry. Ancestry was not estimated, due to poor preservation of the cranium, which was crushed, making metric and morphological analysis unavailable. Race was likely to be "Colored" or "Black", as this person was recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This woman was an adult possibly in her thirties. Poor preservation of the skeletal remains limited access to features useful for adult age estimation. The roots of the third molars were completely developed. The ectocranial sutures were patent and unobliterated, and there were no arthritic changes on the few joint surfaces (right acetabulum, right femoral head) available for inspection, which indicated she was not an older adult. Dental wear consisted of lowered cusps and exposed dentin and there was some tooth loss, so middle-age was not excluded (Figures 5.37 and 5.38).

Stature. Stature from bone measurements was not available for this individual, due to the poor preservation. Photogrammetry of the in-situ skeleton was used. The distance from the crushed crown to the distal right calcaneus (heel) was approximately 1.72 meters, equivalent to 67.71 inches. This was a direct measurement of a 3D model of the skeleton, not the living person. We do not have an error range for this measurement. Living stature with an intact cranium would probably be lower.

Individualizing traits or anomalies. This individual had a gold-colored crown on the left upper first incisor (tooth #9; see Figure 5.37).

Antemortem or pathological conditions. Multiple teeth have linear enamel hypoplasia, i.e., bands of minimal

***Figure 5.36**. The Burial 40 sciatic notch showing a wide angle (arrow).*

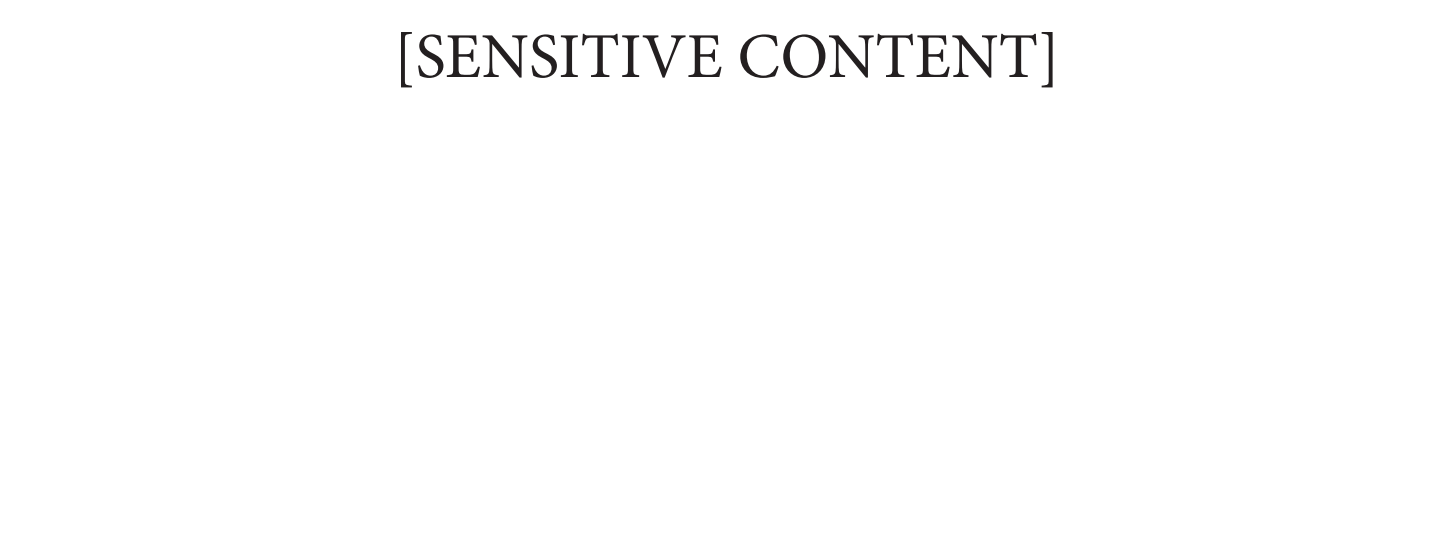


***Figure 5.37**. Maxillary dentition with cavities from Burial 40. The left first incisor had a gold-colored crown. This image was brightened by 10% in Microsoft Word.*

[SENSITIVE CONTENT]

Figure 5.38. *The recovered mandibular (lower) teeth from Burial 40, showing dental wear and a cavity in the left second molar (arrow).*

or absent enamel deposition. Carious lesions (cavities) are present on teeth 2, 7, 11, 15, 16, and 18 (see Figures 5.37 and 5.38). These were large lesions, often interproximal. The cavity on the left lower molar had a shaped appearance (see Figure 5.38) suggesting it might have had a filling which was not recovered. Several teeth were lost in life, including all four upper premolars and the left lower second premolar and first molar. Additional teeth were absent, but fragmentation of the maxilla and mandible precluded confirmation of timing of the loss, such as for the right upper second premolar (tooth #13), which was lost weeks before death as indicated by remodeling of the socket.

Perimortem trauma. No perimortem trauma, or trauma associable with a cause of death, was observed visually or radiographically in these fragmentary remains.

Postmortem damage. Fragmentation of these fragile remains was exacerbated by exhumation and transport. The cranium was crushed prior to exhumation, which is consistent with buried remains.

DNA sampling. Seven (7) teeth were submitted for DNA analysis (Figure 5.39).

Summary of conclusions and opinions. Burial 40 contained an adult female, probably in her twenties or thirties. Prolonged burial caused the skull to be crushed and the entire skeleton to become very fragile. Exhumation and

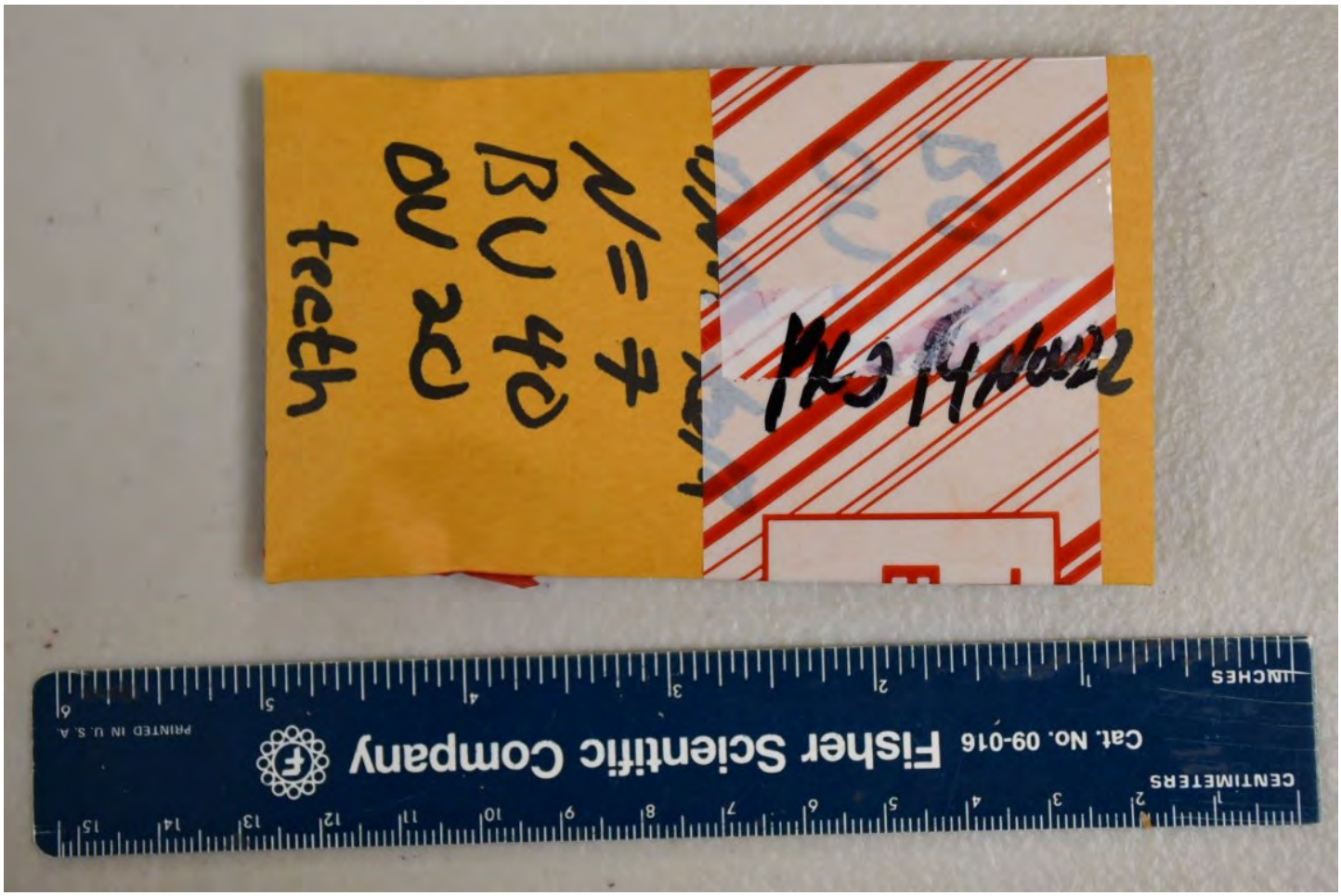


Figure 5.39. *Seven (7) teeth from Burial 40 sealed and submitted for DNA analysis.*

analysis reduced most of the skeleton to small fragments. Her right hand was preserved in a clenched-form at her side. She had a gold crown on her upper left first incisor, which would have been observable in life. The gold crown indicates dental appearance was a priority, if not dental care. Her dental health in general featured tooth loss, multiple cavities, and enamel wear. Her stature was approximately 67 inches, although this is a rough estimate based on her skeletal length in the burial. No signs of perimortem trauma, i.e., trauma associable with a cause of death, were observed visually or radiographically. This individual is excluded from classification as one of the documented Tulsa Race Massacre victims, due to her female biological sex.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 41
OAKLAWN UNKNOWN NUMBER: 23
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 574, 575, 587, 595, 596, 654

Condition of remains. In situ, the remains were predominately articulated and in anatomical position (Figure 5.40). Exhumation and transport resulted in fragmentation, especially of the long bones (Figure 5.41). The remains were earth-stained and small plant roots were associated with the soil in the torso area. The cranial vault transported intact, but the facial skeleton detached during exhumation. Many long bone diaphyses were intact, although epiphyses were poorly preserved. Manual and pedal elements were observed, including a ring recovered on a proximal phalanx of the left hand (Figure 5.42).

Number of individuals: One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After visual and radiographic inspection, representatives from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left ulnae
hyoid body	right and left radii
teeth #1-13, 15-28, 30-32	right and left os coxae
right and left ribs	right and left femora
cervical, thoracic, and lumbar vertebrae	right and left tibiae
right and left scapulae	right and left fibulae
right and left clavicles	manual and pedal elements
right and left humeri	

[SENSITIVE CONTENT]

Figure 5.40. *In situ overview of the Burial 41 remains.*

[SENSITIVE CONTENT]

Figure 5.41. *Overview of the Burial 41 remains after transport to the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.42. *Burial 41 proximal phalanx of the left hand with a gold ring.*

Sex. This individual was a biological male. Portions of the cranium and os coxa were available to assess based on the standards in Buikstra and Ubelaker (1994). The greater sciatic notch was narrow, the nuchal crest was pronounced with an inion hook, and the mastoid process, supraorbital margins, and glabella area were prominently-developed; these are features consistent with male morphology (Figures 5.43, 5.44, and 5.45).

Initial DNA results by Intermountain Forensics confirmed this assessment.

Ancestry. Due to cranial fragmentation, ancestry was tentatively assessed as African descent. The cranium provided multiple morphological traits found with high frequencies in individuals of African descent, specifically a nasal aperture with a smooth anterior border, presence of a nasal gutter, a wide interorbital distance, and maxillary prognathism (Figures 5.46 and 5.47). Race was likely to be "Colored" or "Black", as this person was recovered from the Colored Potters Field of Oaklawn Cemetery.

[SENSITIVE CONTENT]

Figure 5.43. *View of the Burial 41 os coxa showing narrow sciatic notch (arrow).*

[SENSITIVE CONTENT]

Figure 5.44. *Lateral view of the Burial 41 cranium showing glabella and the mastoid*

[SENSITIVE CONTENT]

Figure 5.45. *View of the Burial 41 nuchal crest and its inion hook.*

[SENSITIVE CONTENT]

Figure 5.46. *Anterior view of the Burial 41 maxilla showing guttering at the nasal margin (arrow).*

[SENSITIVE CONTENT]

Figure 5.47. *Radiograph of the Burial 41 skull including lateral views of the maxilla (boxed).*

Age. This man was an adult, neither a young adult, nor elderly. The third molars were fully erupted and showed wear to the dental cusps (Figures 5.48 and 5.49). All observable epiphyses were fully fused. Slight to moderate arthritic changes were noted to the vertebrae and scapular glenoid fossae (Figure 5.50). The preferred skeletal age indicator sites for adults, such as the pubic symphyses, auricular surfaces or sternal rib ends, were unavailable for evaluation due to poor preservation.

[SENSITIVE CONTENT]

Figure 5.48. *The Burial 41 mandibular dentition showing cavities on the second molars and the right third molar.*

Stature. Stature was estimated from the maximum length of the humerus and calcaneus, using the 19th Century Black Male population in FORDISC (Jantz and Ousley 2009 version 3.1.322). With a 95% prediction interval, stature was estimated at 67.9 ± 3.3 inches (64.6 - 71.2 inches). The formula, based on a cadaver sample, was: 0.12419 * CALCXL+HUMXLN (425 mm) + 15.16 inches.

Similarly, the skeletal length in the burial, measured photogrammetrically from the crown of the intact vault to the inferior surface of the right heel, was 68.11 inches.

Individualizing traits or anomalies. A gold ring was recovered surrounding a phalange from the left hand. The ring was embossed "14K" (Figures 5.51 and 5.52) on the internal surface.

Antemortem or pathological conditions. This individual displayed multiple indicators of poor health. As mentioned above, marginal lipping was noted to the vertebrae and scapular glenoid fossae suggestive of osteoarthritis. Despite nearly complete dentition, cavities were present on teeth #2, 18, 31, and 32, and alveolar resorption and root exposure consistent with periodontal disease was evident on the buccal teeth. Teeth #14 and #29 (upper left first molar and lower right fourth premolar) were lost during life. Reactive bone was noted on the hard palate and left maxillary sinus (Figures 5.53 and 5.54), likely indicative of chronic sinus infections.

[SENSITIVE CONTENT]

***Figure 5.49**. View of the Burial 41 maxillary dentition.*

[SENSITIVE CONTENT]

***Figure 5.50**. Lateral views of the Burial 41 scapular glenoid fossae showing arthritic development.*

***Figure 5.51**. Gold ring associated with the individual from Burial 41.*

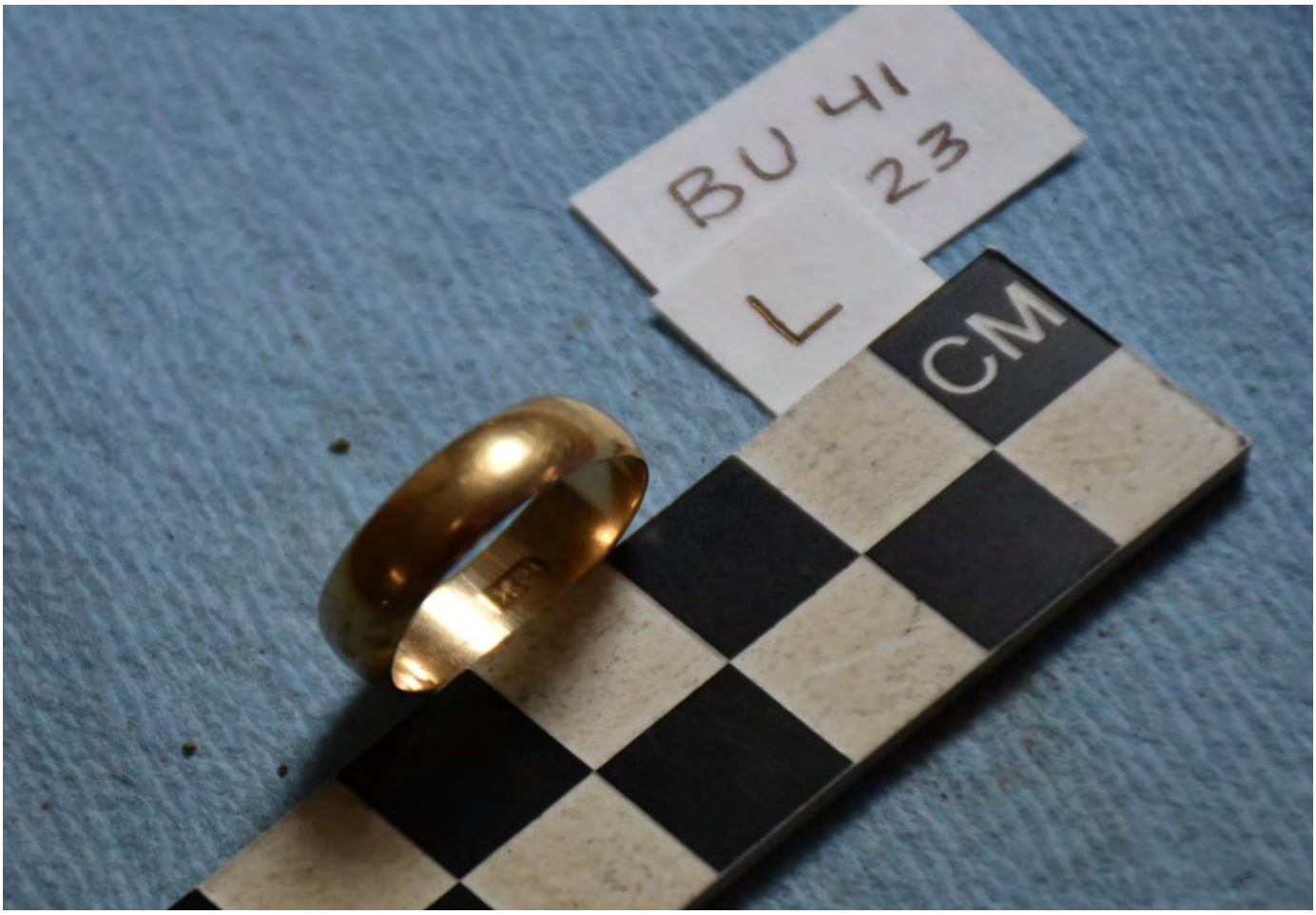


***Figure 5.52**. Internal view of the Burial 41 gold ring showing an embossed "14K".*

[SENSITIVE CONTENT]

Figure 5.53. *Inferior view of the Burial 41maxilla showing a reactive palate.*

[SENSITIVE CONTENT]

Figure 5.54. *Interior view of the Burial 41 left maxillary sinus showing reactive porosity.*

A large flat osteoblastic lesion was present on the frontal bone (Figure 5.55). The right femoral shaft appeared remodeled (Figures 5.56 and 5.57) adjacent to a large enthesophyte, or bone spur, on the linea aspera, and healed and active periosteal lesions were observed on the right tibia (Figure 5.58).

Frontal bone lesions could be associated with syphilis, a treponemal disease; however, this defect does not have the characteristic gummatous formation, and other sources of localized reactivity are not excluded. The femoral enthesophyte probably derived from stress or injury to muscle and bone tissue at this location, although the exact source of this feature is speculative. Treponemal disease could also account for the lesions on the right tibia, but periostitis could be derived from multiple etiologies, including inflammation and other infections.

Perimortem trauma. No perimortem trauma, or trauma associable with a cause of death, was observed in these remains.

Postmortem damage. Fragmentation of these fragile remains was exacerbated by exhumation and transport.

DNA sampling. The right femur and eleven teeth were selected and submitted for DNA analysis (Figure 5.59).

Summary of conclusions and opinions. The individual in Burial 41 was an adult male, probably of middle age but definitely neither a young adult nor elderly. Preferred age estimation locations were absent, but closed epiphyses and slight-to-moderate arthritic changes throughout the skeleton supports middle-aged adulthood. His stature was approximately 68 inches. Signs of ill health were present as dental disease, osteoarthritis of the spine and shoulder, probable sinus infection, and cortical and periosteal lesions on the frontal bone, femora, and tibia. The differential diagnoses for these lesions included acquired syphilis or other treponemal disease, but other etiologies were not excluded. No indications of perimortem trauma were observed in these remains, but his overall poor

[SENSITIVE CONTENT]

***Figure 5.55**. Superior view of the Burial 41 cranium showing a large flat osteoblastic lesion on the frontal bone (arrow).*

[SENSITIVE CONTENT]

Figure 5.56. *Radiograph of the Burial 41 right and left femora. A large enthesophyte*

[SENSITIVE CONTENT]

Figure 5.57. *View of the Burial 41 right femoral shaft showing the large enthesophyte.*

***Figure 5.58**. The Burial 41 right tibia displayed active and healed periosteal lesions.*

***Figure 5.59**. Burial 41 DNA specimens sealed for submission.*

health may provide some insight into his cause of death. The remains were fragmentary, fragile, and earth-stained, consistent with prolonged burial. He was buried with a gold-colored band on a finger of his left hand. As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 42
OAKLAWN UNKNOWN NUMBER: 21
UNIVERSITY OF OKLAHOMA CATALOG NUMBERS: 397, 398, 420, 421, 428, 429, 446, 447, 464, 476, 481, 653, 675-677, 1479

Condition of remains. The in situ Burial 42 remains displayed semi-flexed leg positions with arms at the sides, consistent with limb positions during the bloat phase of decomposition (Figure 5.60). The skull was flattened, forearm bones had migrated out of alignment, the left lower leg was rotated laterally, and the right foot was not observed.

These skeletal remains were very fragmentary (Figures 5.61, 5.62. 5.63, and 5.64) after transport. Wood and nails, consistent with a coffin or wooden container burial, were retrieved with the skeletal remains. The cranium, torso and pelvis were crushed and fragmentary. A left foot with shoe was observed in situ. The elements were pedestaled on soil and extracted on trays, requiring dense packing in the transport container. The bone quality was particularly poor, with sloughing cortical bone, and disintegrating long bones.

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After visual and radiographic inspection, representatives from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left ulnae
teeth #1-32	right and left radii
right and left ribs	right and left femora
cervical, thoracic, and lumbar vertebrae	right and left tibiae
right and left scapulae	right and left fibulae
right and left clavicles	left pedal elements
right and left humeri	

[SENSITIVE CONTENT]

Figure 5.60*. Overview of the Burial 42 remains in situ.*

[SENSITIVE CONTENT]

Figure 5.61. *Upper body overview of the Burial 42 remains after transport to the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.62. *Mid-body overview of the Burial 42 remains after transport to the forensic laboratory.*

Figure 5.63. *"A" layer lower body overview of the Burial 42 remains after transport to the forensic laboratory.*

Figure 5.64. *"B" layer lower body overview of the Burial 42 remains after transport to the forensic laboratory.*

Sex. Due to fragmentation, biological sex was indeterminate. The remains appeared to be a robust individual in the burial (see Figure 5.60), but specific skeletal indicators of sex were not preserved. Initial DNA analysis by Intermountain Forensics determined that this individual was male.

Ancestry. Ancestry was not estimated due to the fragmentary state of these remains. Race was likely to be "Colored" or "Black", as this person was recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was an adult, perhaps in his thirties. His medial clavicles were fused, and the third molars were fully erupted, roots fully formed, and the crowns displayed wear (Figure 5.65). The identifiable joint surfaces, such as the scapular glenoid fossae, fragments of the acetabulum, femoral head, and distal femur were free of arthritic changes. This individual was mature, not elderly, and not a young adult.

Stature. Skeletal length in burial was photogrammetrically measured from the crown of the misshapen cranium to the most distal point of the left shoe as 65.75 inches. Fragmentation precluded estimation of stature from bone measurements.

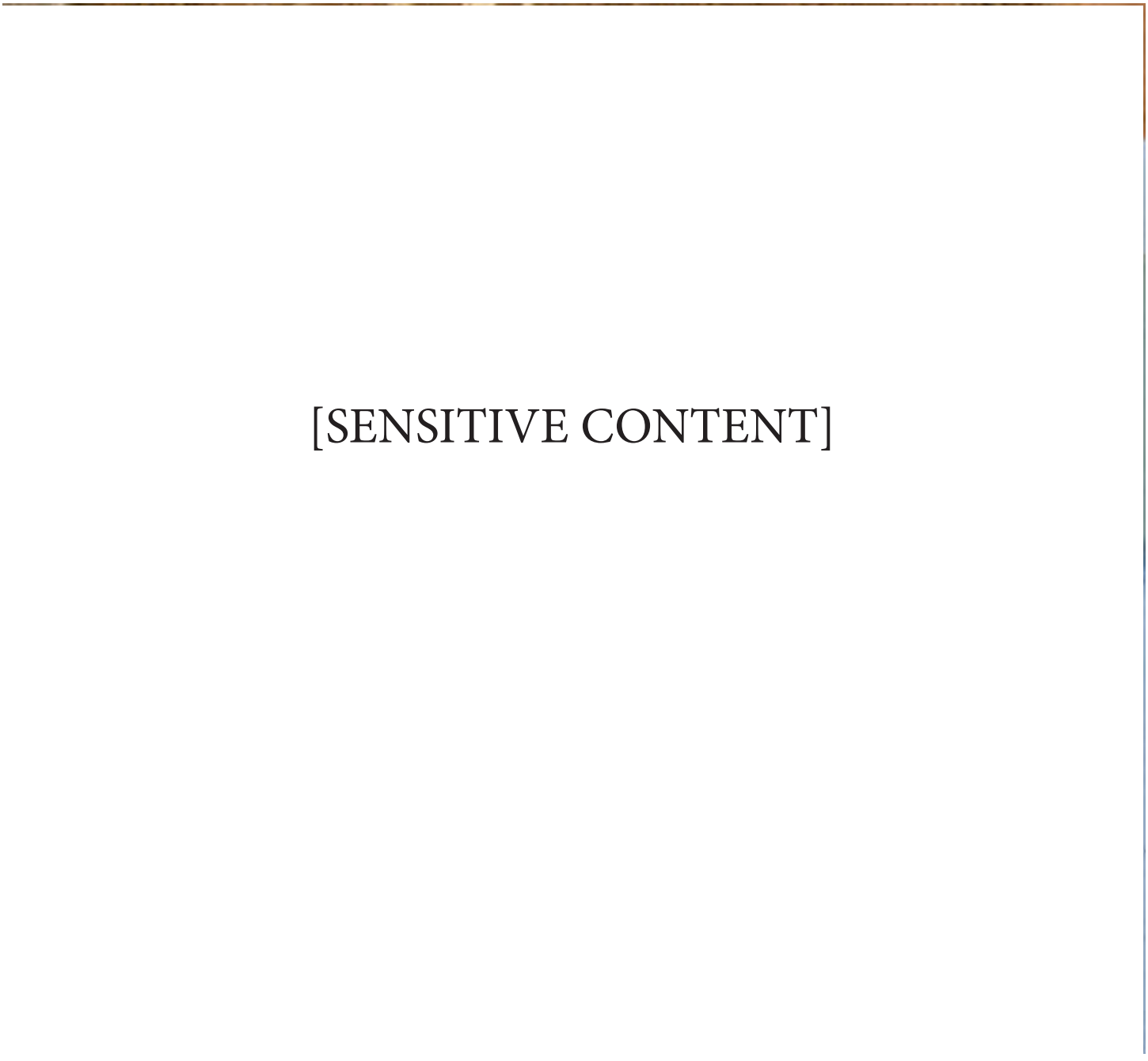


***Figure 5.65**. Overview of the Burial 42 dentition.*

Individualizing traits or anomalies. Radiographic inspection revealed several personal effects. In the torso area, two (2) overalls buttons were observed, although only one was recovered (Figure 5.66). The pelvic radiograph indicated objects that were determined to be, on the left side, a rusted object that was probably a pocket knife, and on the right, a clump of keys and a possible money clip (Figures 5.67, 5.68, 5.69, and 5.70). There was a dark-colored, probably leather shoe on the left foot (Figure 5.71). The right foot was not observed in the burial.

Antemortem or pathological conditions. This individual had the enamel pitting form of enamel hypoplasia, observed on the upper canines.

The long bones of the legs featured a pathological condition consistent with prolonged periostitis. The femurs demonstrated expansion of periosteal bone such that on radiographs, the periosteal bone formed a shell around the cortical surface (Figure 5.72). The right femur was expanded along the proximal two-thirds of the diaphysis, while the left femur was affected along the distal two-thirds. The tibiae were likewise affected, although the expansion was not as dramatic (Figure 5.73). The source of this periostitis is unknown, but known etiologies include primary or secondary hypertrophic osteoarthropathy, and hypertension coupled with lower limb vascular insufficiency. Secondary hypertrophic osteoarthropathy is associated with lung cancer or other bronchial-pulmonary ailments, including asthma and tuberculosis. Lack of preservation throughout the skeleton prevented examination for associated signs, e.g., clubbing in the hands or rib lesions from respiratory cancer or infection.

Perimortem trauma. Trauma analysis for this individual was limited due to the poor preservation. Radiographic examination of the cranium revealed a radiopaque object on the internal occipital bone, and a scatter of radiopaque particles in the intracranial soil (Figure 5.74). After cleaning the object was identified as a deformed bullet core (Figure 5.75). Three large fragments were also recovered. Additional small particles were scattered in the

Figure 5.66*. Lateral view of the overalls button associated with the Burial 42 torso area.*

[SENSITIVE CONTENT]

***Figure 5.67**. Radiograph of the Burial 42 pelvic area, showing the rusted object (arrow), and a clump of keys and possible money clip.*

***Figure 5.68**. The rusted object obtained from the Burial 42 left pelvic area.*

Figure 5.69. *The clump of keys recovered from the Burial 42 right pelvic area. Image courtesy of the City of Tulsa.*

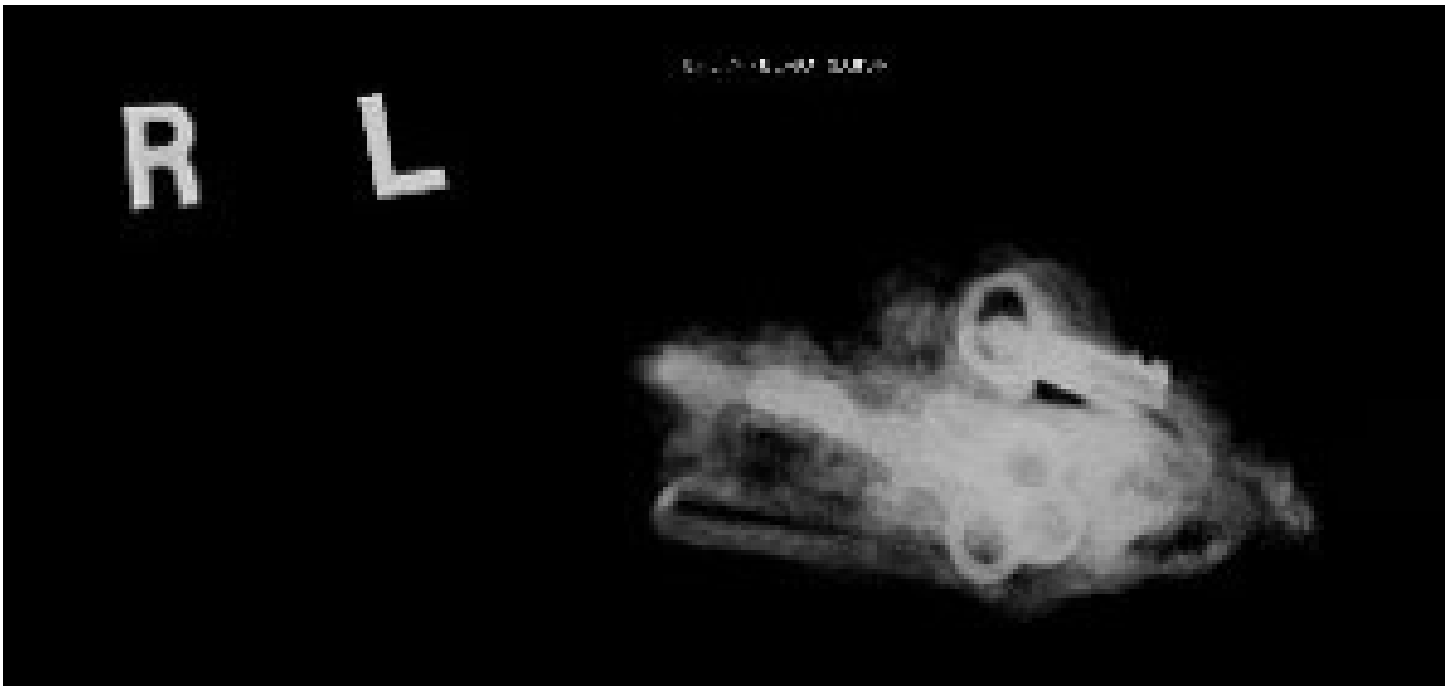


Figure 5.70. *Radiograph of the Burial 42 keys, showing at least two keys*

[SENSITIVE CONTENT]

Figure 5.71. *The probable leather shoe on the left foot of Burial 42.*

[SENSITIVE CONTENT]

Figure 5.72. *Radiograph of the Burial 42 femora showing the periosteal bone expansion.*

[SENSITIVE CONTENT]

Figure 5.73. *Radiograph of the Burial 42 tibiae showing the periosteal bone expansion.*

[SENSITIVE CONTENT]

Figure 5.74. *Radiograph of the Burial 42 cranial vault showing radiopaque masses at the internal occipital.*

Figure 5.75. *View of deformed bullet core and associated fragments extracted from the Burial 42 cranium.*

surrounding soil behind the facial skeleton and near the main bullet fragment. The fragment concentration is consistent with settling of the cranial contents during decomposition and soil infilling, as the bullet fragments were suspended in the soil directly adjacent to the facial skeleton which was recovered from within the vault. An entrance wound was not identified, due to poor preservation of multiple cranial elements, including part of the frontal, most of the temporals, and the basioccipital; presence of the bullet indicates there was no exit. Radiating fractures (Figure 5.76) into the frontal, left parietal, squamous occipital, and the diastatic fractures of the sagittal and coronal sutures were consistent with energy dispersal from a projectile wound.

Postmortem damage. Fragmentation of these fragile remains was exacerbated by exhumation and transport. The right foot was not identified in the burial or soils near the right leg. However, radiopaque particles in the soil of the lower torso area vaguely resemble the nails observed with the left shoe (Figures 5.77 and 5.78). This soil was not manually inspected. Considering the bloated positioning of the skeleton, the shoe and/or foot may have been lost prior to burial.

DNA sampling. The right femur and 12 teeth were submitted for DNA analysis on 21 Nov 2022. On 18 Aug 23 the occipital, mandible with teeth, one loose tooth, right petrous, left femur fragments, tibia fragments, humerus, radius and ulna were also submitted (Figure 5.79).

[SENSITIVE CONTENT]

***Figure 5.76**. Superior view of the Burial 42 cranial vault, illustrating radiating fractures and sagittal diastatic fractures.*

[SENSITIVE CONTENT]

Figure 5.77. *Radiograph of the Burial 42 left shoe and associated soil.*

[SENSITIVE CONTENT]

Figure 5.78. *Portion of the Burial 42 lower torso intake radiograph showing interesting radiopaque particles.*

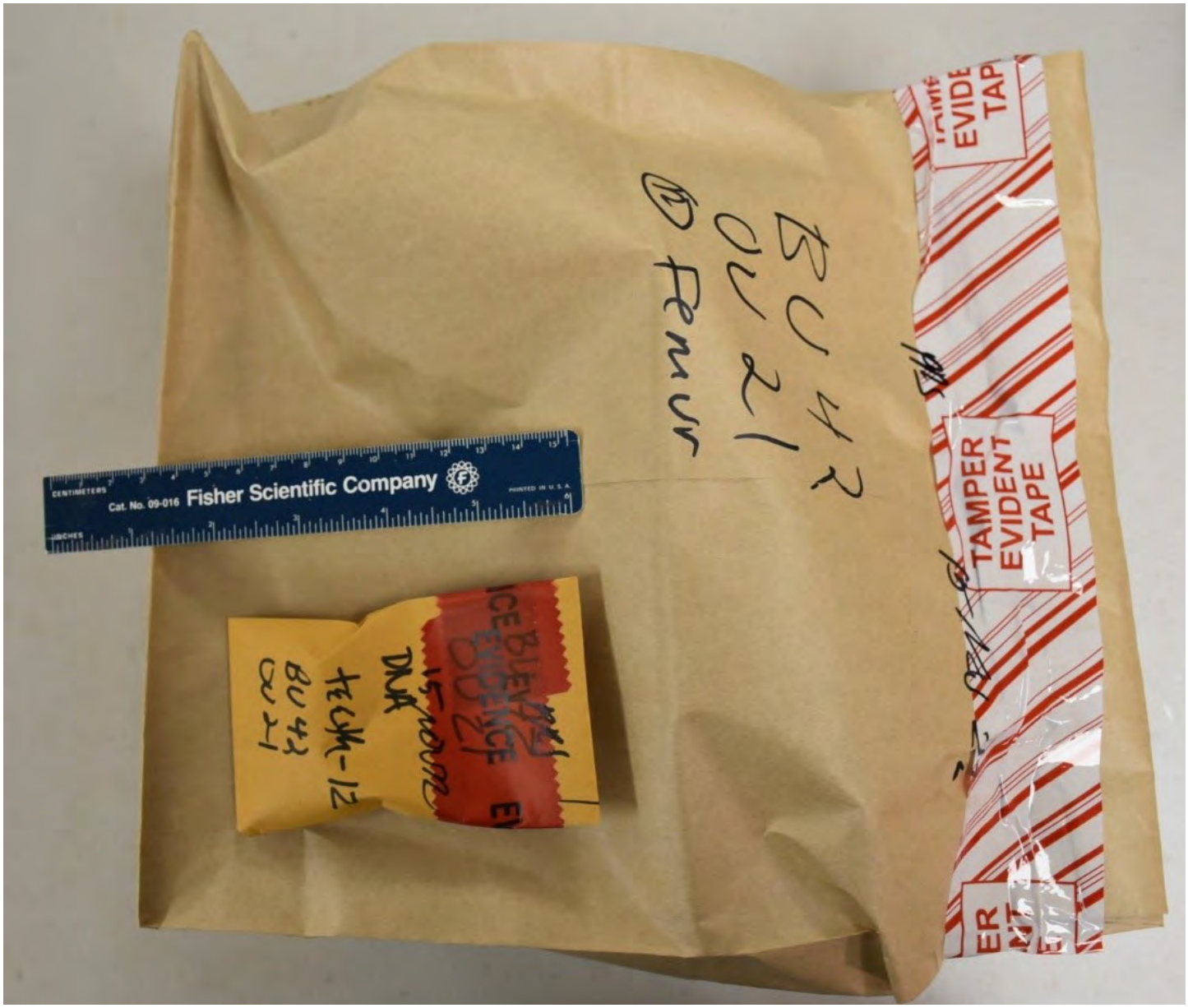


Figure 5.79. *The Burial 42 right femur and twelve (12) teeth sealed and submitted for DNA analysis.*

Summary of conclusions and opinions. The individual in Burial 42 was a younger adult, based on the morphology of the preserved joint surfaces. Lack of preservation prevented visual identification of biological sex, although early DNA analysis indicated this individual was male. Evidence of a gunshot wound, demonstrated by a bullet core, lead scatter, and radiating fractures indicative of projectile trauma, was present in the cranium. This man also had chronic periostosis in both femurs and tibiae., possibly due to secondary hypertrophic osteoarthropathy, but other etiologies were note excluded. Personal effects observed with this individual included a possible pocket knife, several keys and possible money clip, two overall buttons and the left shoe.

This male is included as a possible victim of the Tulsa Race Massacre, due to the gunshot wound to the cranium and burial in a plain container. Although recovered from an unmarked burial, the arrangement of the skeletal remains in the bloat phase of decomposition suggests that this individual may be Ed Lockard, whose body was recovered on June 4th, according to the mortuary receipt, and buried on June 6th according to his death certificate. This hypothesis will require successful genealogical testing, as the burial with the Ed Lockard marker has not been disturbed during this investigation.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 45
OAKLAWN UNKNOWN NUMBER: 24
UNIVERSITY OF OKLAHOMA CATALOG NUMBERS: 591-594, 634, 635

Condition of remains. In situ, the skull was angled into the corner of the casket, and the hands and wrists appeared crossed over the pelvis (Figure 5.80). The remains were predominately in anatomical position. During exhumation, the cranium collapsed and the remains were bundled in paper to prevent imaging by an external photographer. During skeletal analyses, these remains were earth-stained, friable and very fragmentary (Figures 5.81 and 5.82). Poor preservation was demonstrated by cortical sloughing and bone fragmentation. Wood fragments, consistent with a coffin or wooden container burial, were recovered with the remains.

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After visual and radiographic inspection, representatives from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left humeri
teeth #1-22, #27-32	right and left ulnae
right and left ribs	right radius
cervical, thoracic, and lumbar vertebrae	right and left os coxae
sacrum	right and left femora
right scapula	right and left tibiae
right and left clavicles	manual and pedal elements

Sex. This individual was a biological male. The preserved cranial features demonstrated traits associated with male sex (Buikstra and Ubelaker 1994), including a well-developed nuchal crest and a large mastoid process. The diameter of the right femoral head (50 mm; Bass 1995) was also consistent with male biological sex. Initial DNA results provided by Intermountain Forensics confirmed this assessment.

[SENSITIVE CONTENT]

Figure 5.80. *In situ view of the BL 45 remains.*

[SENSITIVE CONTENT]

Figure 5.81. *Superior overview of the exhumed Burial 45 remains.*

[SENSITIVE CONTENT]

Figure 5.82. *Inferior overview of the exhumed Burial 45 remains.*

Ancestry. Ancestry was assessed as African descent. The cranium provided multiple morphological traits found with high frequencies in individuals of African origin, specifically a wide nasal aperture with a sloped anterior border, a wide interorbital distance, a broad palate, and maxillary prognathism (Figures 5.83 and 5.84). Race was likely to be "Colored" or "Black", as this person was recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was a young adult, in his early twenties. The medial clavicles displayed unfused epiphyses (Figure 5.85). Several rib heads had open lines of fusion (Figure 5.86). Thoracic vertebrae showed fusing annular

[SENSITIVE CONTENT]

Figure 5.83. *Anterior view of the Burial 45 cranium. The right upper first incisor had a gold-colored crown.*

[SENSITIVE CONTENT]

Figure 5.84. *Occlusal view of the Burial 45 maxillary dentition.*

[SENSITIVE CONTENT]

Figure 5.85. *View of Burial 45 medial clavicles with unfused epiphyses.*

[SENSITIVE CONTENT]

Figure 5.86. *Various ribs from Burial 45 demonstrating partially fused heads.*

rings (Figure 5.87), and the first lumbar had unfused annular rings. The first and second sacral vertebrae were unfused (Figure 5.88). The humeral and femoral heads and iliac epiphyses also demonstrated recent fusion (Figures 5.89, 5.90, and 5.91).

The majority of males show in-progress thoracic vertebral ring fusion at ages 17 to 26 years (Albert and Maples, 1995). This individual was older than 18, based on fusion of the humeral heads, and less than 25 based on incompletely fused rib heads and unfused medial clavicles (Schaefer et al., 2009).

Stature. Stature from bone measurements was not available for this individual, due to the poor preservation. Fragmentation precluded estimation of stature from bone measurements. Skeletal length in burial was photogrammetrically measured from the crown of the cranium to the base of the neck and from the base of the neck to the most distal point of the right heel as 70.47 inches.

Individualizing traits or anomalies. Tooth #8, the right upper first incisor, had a gold-colored crown (see Figures 5.83 and 5.84). The left upper third molar (tooth #16) had an enamel pearl at the root bifurcation (Figure 5.92).

Antemortem or pathological conditions. Lumbar vertebrae 2-4 displayed compressed bodies (Figure 6.93). The morphology was not associated with degenerative changes such as porosity or osteophyte development and possibly derived from chronic compressive loading of the spine while a child.

Perimortem trauma. No evidence of perimortem trauma was observed in these fragmentary remains.

Postmortem damage. Fragmentation of these fragile remains was exacerbated by exhumation and transport. One metacarpal (probable #5) exhibited uniform bone loss of the posterior surface (Figure 6.94). This form of bone loss could be associated with thermal damage, during which the exposed dorsal surface of the hand was differentially

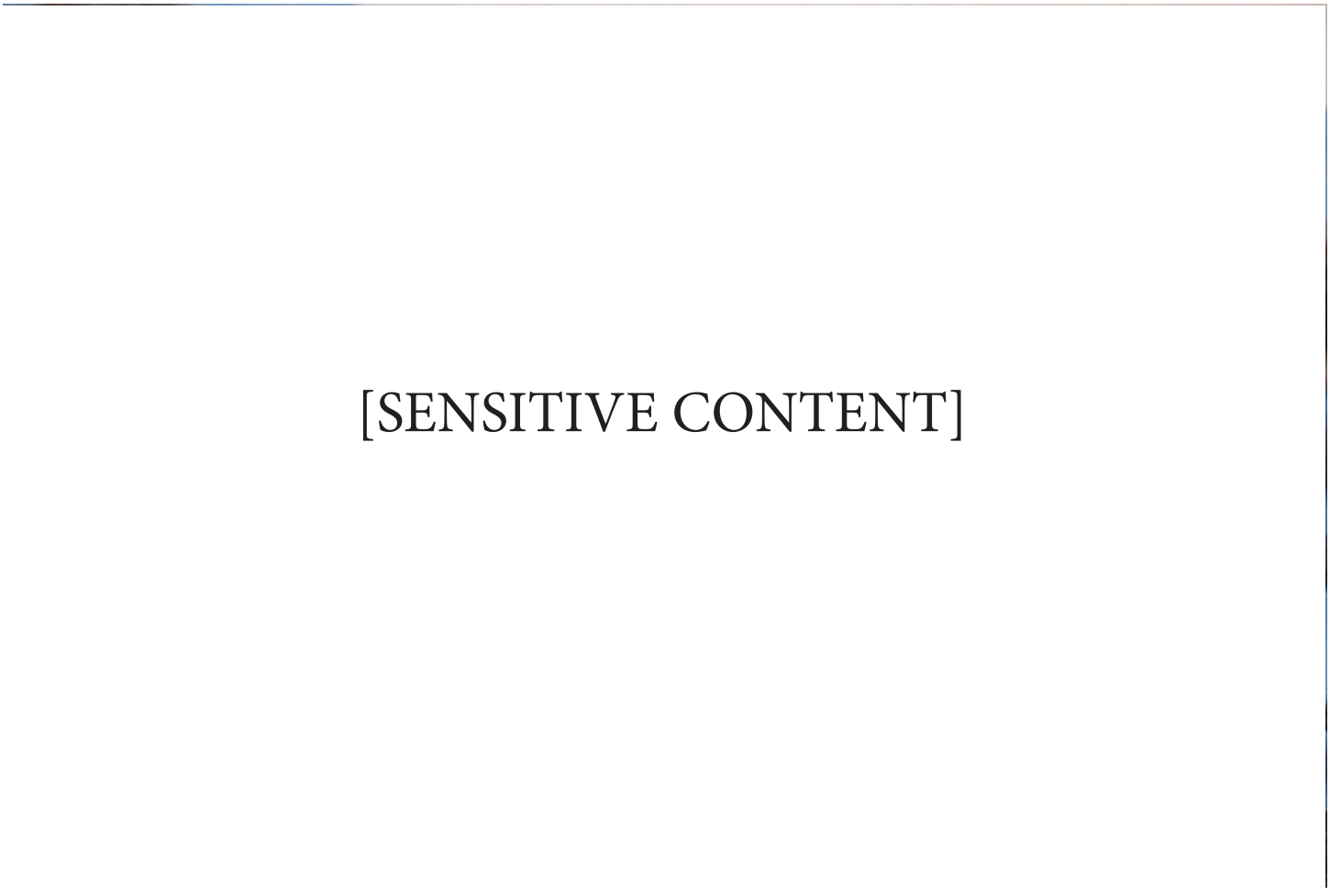


Figure 5.87. *Posterior view of a thoracic vertebra from Burial 45 showing the incompletely fused rings.*

[SENSITIVE CONTENT]

Figure 5.88. *Burial 45 sacrum showing lack of fusion between the first and second segments.*

[SENSITIVE CONTENT]

Figure 5.89. *View of proximal humerus from Burial 45 and line of fusion at epiphysis (arrow).*

[SENSITIVE CONTENT]

Figure 5.90. *View of Burial 45 proximal femora and line of fusion at the femoral head (arrow).*

[SENSITIVE CONTENT]

Figure 5.91. *View of Burial 45 left ilium and fusing epiphysis at arrow.*

[SENSITIVE CONTENT]

Figure 5.92. *View of upper third molar from Burial 45 with enamel pearl on the bifurcation.*

[SENSITIVE CONTENT]

Figure 5.93. *Posterior oblique view of the lumbar vertebrae from Burial 45.*

[SENSITIVE CONTENT]

Figure 5.94. *View of metacarpal from Burial 45 with eroded dorsal surface.*

destroyed while the ventral surface was spared due to contraction of the hands into the pugilistic pose. The in situ view of the remains displayed erosion to the dorsal surface of multiple metacarpals of the left hand. As this hand lay on the pelvis, rub from the coffin lid was not excluded as a source of the damage.

DNA sampling. Twenty-seven (27) teeth and both femora were submitted for genetic analyses (Figure 5.95).

Summary of conclusions and opinions. Burial 45 contained a young man less than 25 years old, of African descent. His stature was approximately 70 inches. He had a gold-colored crown on the right first incisor which would have been observable in life. His lower back showed compressed morphology that was possibly due to heavy lifting while his spine was still growing and developing. There was no evidence of trauma associable with a cause of death. However, one metacarpal displayed uniform bone loss to the dorsal surface, a feature consistent with thermal damage. Poor preservation of the skeletal remains precluded examining additional hand elements for this damage, so other sources of bone erosion were not excluded. As a male in a plain casket, with possible thermal damage to the left hand, this individual is of interest as a possible victim of the race massacre.

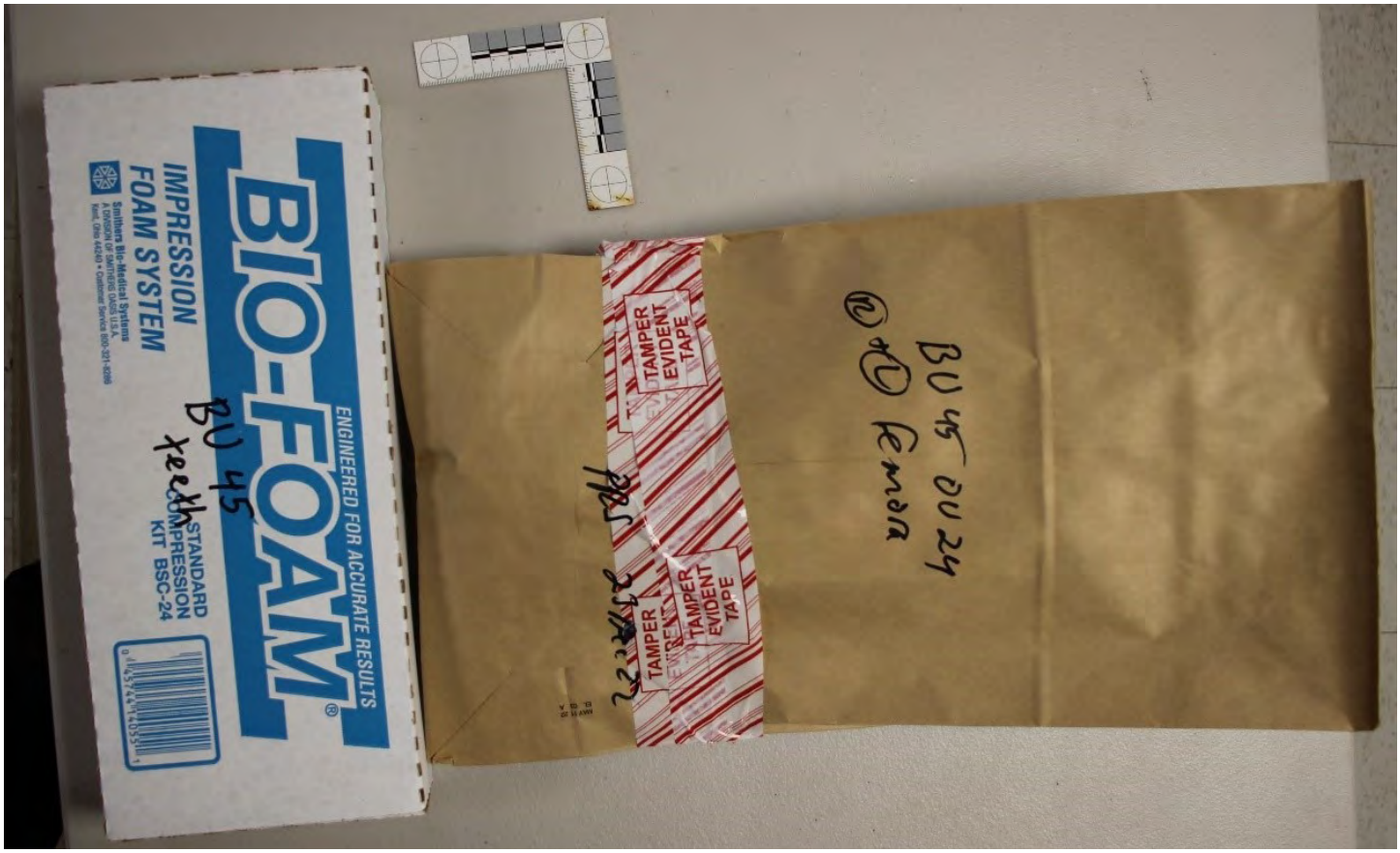


Figure 5.95. *Femora and teeth from Burial 45 submitted for DNA analysis.*

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 65
OAKLAWN UNKNOWN NUMBER: 27
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 614, 638, 639, 650-652, 668, 669

Condition of remains. In situ, the remains were oriented with the head in the opposite direction applied for most burials. The hands had been crossed over the chest, with the manual elements located on the upper torso (Figure 5.96). After transport, these remains were fragmentary and fragile (Figures 5.97 and 5.98). Large segments of long bone shafts were preserved while many joints were crushed or disintegrated. The cranial vault was preserved while the facial skeleton was crushed. The remains were earth-stained in color. The state of these remains was consistent with prolonged burial. Butvar was applied to the cranial vault, vertebrae, pelvic area, and femurs. A safety pin was recovered from the right pelvic area (Figure 5.99).

[SENSITIVE CONTENT]

Figure 5.96. *In situ overview of Burial 65 remains with hands crossed over the chest.*

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After visual and radiographic inspection, representatives from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left humeri
teeth #1-6, 9-16, 18, 20-29, 31	right and left ulnae
hyoid body and left greater horn	right and left radii
right and left ribs	right and left os coxae
sternum (manubrium, gladiolus, xiphoid)	right and left femora
cervical, thoracic, and lumbar vertebrae	right and left tibiae
sacrum	right and left fibulae
right and left scapulae	manual and pedal elements
right and left clavicles	

Sex. This individual was a biological female. The pubic region displayed the ventral arc, subpubic concavity, and narrow ischiopubic ramus ridge consistent with female anatomy (Phenice 1969).

Initial DNA analysis by Intermountain Forensics confirmed this assessment.

Ancestry. Ancestry was not estimated, due to poor preservation of the cranium. The facial cranium was crushed, making metric and morphological analysis unavailable. Race was likely to be "Colored" or "Black", as this individual was recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was middle aged, in her thirties or forties. The morphology of the fragmentary left pubic symphysis (Figure 6.100) displayed remnants of a billowy surface-texture and complete development of the margins in the preserved areas. This morphology resembled Suchey-Brooks (1990) phase IV which has a mean age of 38.2 and a 95% confidence interval of 26 to 70 years. Osteoarthritic lipping consistent with middle age was present on both fovea capiti, the central attachment points of the femoral heads (Figure 5.101).

Stature. Skeletal length in burial was photogrammetrically measured from the crown of the cranium to the base of the neck, then to the most distal point of the right heel as 64.96 inches. Fragmentation precluded estimation of stature from bone measurements.

Individualizing traits or anomalies. Several teeth were lost during life, and caries (cavities) were present on several anterior teeth (Figures 5.102, 5.103, and 5.104). This individual had a peg shaped left upper second incisor

[SENSITIVE CONTENT]

Figure 5.97. *Upper body overview of the exhumed Burial 65 remains.*

[SENSITIVE CONTENT]

Figure 5.98. *Lower body overview of the exhumed Burial 65 skeletal remains.*

[SENSITIVE CONTENT]

Figure 5.99. *The fragmentary safety pin recovered from the right pelvic area of Burial 65.*

[SENSITIVE CONTENT]

Figure 5.100. *Burial 65 medial view of the fragmentary left pubic symphyseal surface. The upper portion was not recovered.*

[SENSITIVE CONTENT]

Figure 5.101. *Medial view of the fragments of Burial 65 femoral heads, showing the osteoarthritic changes to the central attachment point.*

[SENSITIVE CONTENT]

Figure 5.102. *Overview of Burial 65 maxillary dentition, highlighting the peg-shaped lateral incisor (arrow).*

[SENSITIVE CONTENT]

Figure 5.103. *Anterior view of the Burial 65 lower teeth, showing cavities in the canines and one incisor (arrows).*

[SENSITIVE CONTENT]

Figure 5.104. *View of the Burial 65 mandible, showing gaps for molars lost during life, and the anomalous right second molar which had additional cusps (arrow).*

(tooth #10); these and the caries would have been observable in life. Not as observable, but anomalous, is the morphology of the lower right second molar (tooth #31), which had two large additional cusps.

Antemortem or pathological conditions. As noted above, caries (cavities) were present on several teeth, including the upper right first molar, the upper left first incisor, the upper left fourth premolar and first molar, the lower left canine and second incisor, and the lower right canine. There was loss during life of both upper right incisors, both lower first molars, and both lower third molars.

Perimortem trauma. At least four (4) lower thoracic, all of the lumbar vertebrae, and a lower sacral vertebra had shear fractures of the centra (Figures 5.105 and 5.106). These fractures had no sign of healing. The upper thoracic vertebrae were not affected. Burial taphonomic processes were not excluded as a source of these fractures, as burial compression may be a sufficient force.

The left femur had a shear fracture in the upper third of the diaphysis (Figure 5.107). This fracture displayed no signs of healing. Burial taphonomic processes were not excluded as a source of this fracture, although the right femur shaft was not affected. Femoral diaphyseal fractures are associated with forces such as (but not exclusive to) directed blunt force, vehicle collision, and falls from height.

Postmortem damage. Fragmentation of these fragile remains was exacerbated by exhumation and transport, although these remains demonstrated more resilience as the fragment size was larger, including intact long bone shafts. The preservation of these remains is consistent with prolonged burial.

DNA sampling. Twenty-four teeth (24; the entire dentition) and the right femur were submitted for DNA analysis (Figure 5.108).

[SENSITIVE CONTENT]

Figure 5.105. *The recovered Burial 65 thoracic vertebrae, showing complete fractures of the larger bodies of the lower vertebrae (arrows).*

[SENSITIVE CONTENT]

Figure 5.106. *The recovered Burial 65 lumbar vertebrae, showing complete fractures of the bodies of each vertebra.*

[SENSITIVE CONTENT]

Figure 5.107. *Overview of the Burial 65 left femur with a shear fracture in the upper third of the diaphysis.*

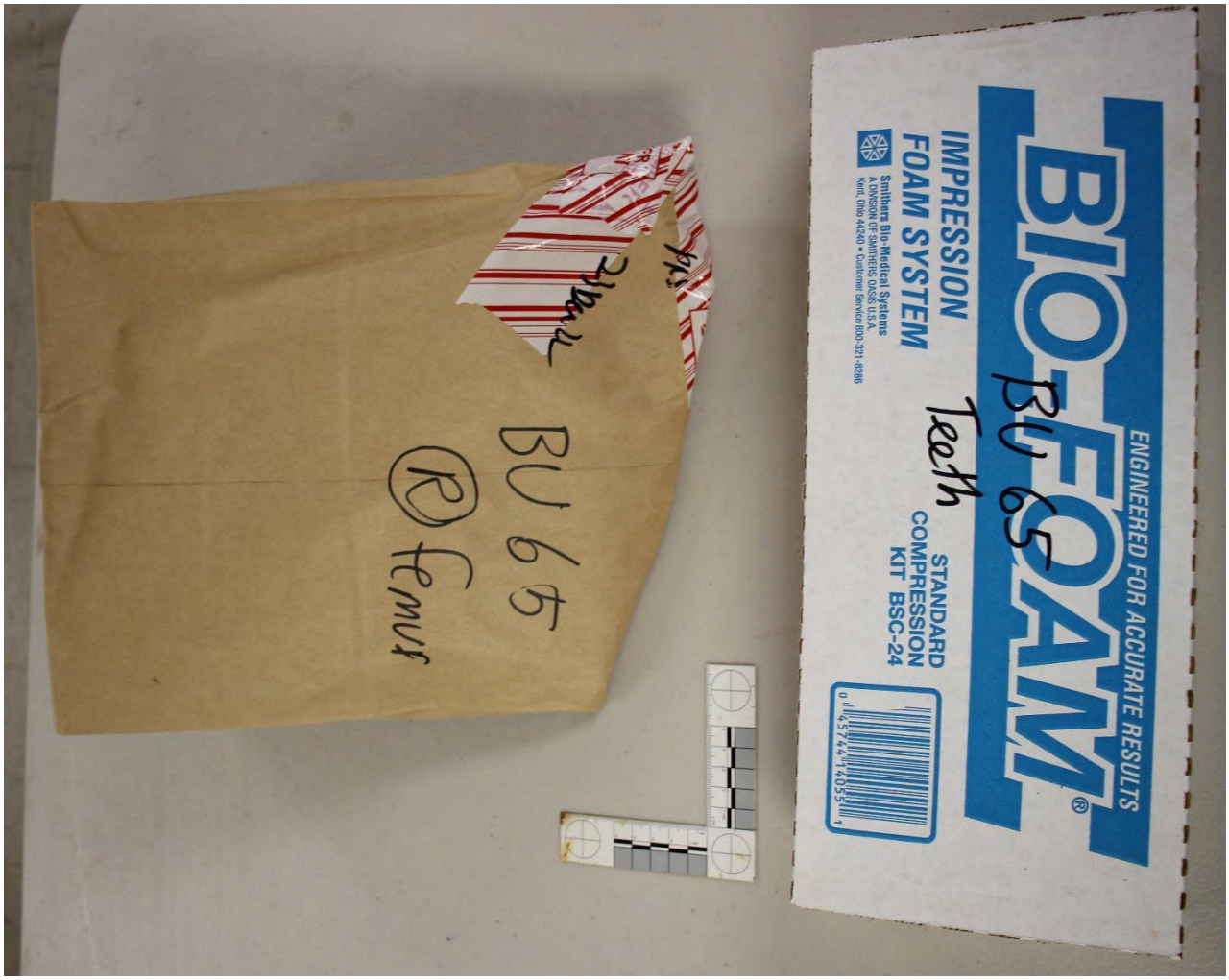


Figure 5.108. *Overview of the Burial 65 left femur with a shear fracture in the upper third of the diaphysis.*

Summary of conclusions and opinions. The individual in Burial 65 was a middle-aged woman. Her stature was approximately 65 inches, and she had interesting dentition, including a peg-shaped upper incisor, a molar with extra cusps, and numerous cavities on her anterior teeth. She may have experienced a left femur fracture in association with her time of death. Fractures to the bodies of the lower thoracic, lumbar, and sacral vertebrae may also be associated with the end of life interval, although burial compression processes were not excluded. A safety pin was recovered from the pelvic region.

Despite recovery from a plain casket, this individual is excluded from classification as one of the documented Tulsa Race Massacre victims, due to her female biological sex.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 67
OAKLAWN UNKNOWN NUMBER: 26
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 616, 642-645,678

Condition of remains. Although predominately in anatomical position, these remains displayed rotation of the lower limb elements, such that both femora were rotated laterally, and the left lower leg was facing downward (Figure 5.109). Water intrusion into the lower half of the burial may be the source of the limb rotations in combination with shifting during decomposition. The skull was crushed. A large flat rock, intrusive from beneath the burial, was present beneath the torso and right elbow.

[SENSITIVE CONTENT]

Figure 5.109. *In situ overview of the Burial 67 remains. The femurs are rotated outward, and the left lower leg is rotated face downward.*

These skeletal remains were friable and very fragmentary after transport to the lab (Figures 5.110 and 5.111). Plant roots were present among and within the remains. Wood fragments and nails, consistent with a coffin or wooden container burial, were present. Some diaphyses were preserved. The degree of preservation was consistent with prolonged burial.

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After visual and radiographic inspection, representatives from the following classes of skeletal elements were observed:

skull (cranium and mandible)	right and left ulnae
teeth #1-6, 8-20, 22-24, 28-32	right and left radii
right and left ribs	right and left os coxae
cervical, thoracic, and lumbar vertebrae	right and left femora
sacrum	right and left tibiae
right and left scapulae	right and left fibulae
right and left clavicles	manual and pedal elements
right and left humeri	

Sex. Preservation was poor, but this individual was very robust and was a biological male. The fragments of clavicle, scapula, ribs, humeri, and femora were large. The mastoid processes were short, thick and wide. The nuchal crest made a pronounced fold and had an inion hook (Figure 5.112).

Initial DNA analysis by our colleagues at Intermountain Forensics confirmed this assessment.

Figure 5.110. *Upper body overview of the fragmentary Burial 67 skeletal remains.*

Figure 5.111. *Lower body overview of the fragmentary Burial 67 skeletal remains.*

Ancestry. Ancestry was not estimated, due to poor preservation of the cranium. Race was likely to be "Colored" or "Black", as this individual was recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. Due to poor preservation, there were minimal features appropriate for age estimation. This man was an adult, neither a young adult nor elderly. The preserved pubic symphysis and auricular surfaces were eroded, had a woody texture, and were not scorable (Figure 5.113). This man was an adult, as the third molars were fully erupted (Figures 5.114 and 5.115), and no observable epiphyses were unfused. No arthritic changes were observed throughout the skeletal remains.

[SENSITIVE CONTENT]

Figure 5.112. *View of the projecting inion hook on the Burial 67 occipital bone.*

[SENSITIVE CONTENT]

Figure 5.113. *Medial view of the eroded Burial 67 pubic symphysis, displaying poor preservation of the surface features used for age estimation.*

[SENSITIVE CONTENT]

Figure 5.114. *The Burial 67 maxillary dentition, displaying gold crowns and bridge of the front incisors (arrow).*

[SENSITIVE CONTENT]

Figure 5.115. *View of the Burial 67 mandible displaying fully erupted third molars.*

Stature. Skeletal length in burial was photogrammetrically measured from the crown of the left split of the cranium to the most distal point of the left heel as 65.74 inches. Fragmentation precluded estimation of stature from bone measurements.

Individualizing traits or anomalies. This individual had a gold-colored dental bridge which would have been

[SENSITIVE CONTENT]

Figure 5.116. *View of the Burial 67 anterior (front) side of the gold-colored dental bridge.*

[SENSITIVE CONTENT]

Figure 5.117. *View of the Burial 67 lingual (inner) side of the gold-colored dental bridge.*

observable in life (Figures 5.116 and 5.117). The bridge was composed of crowns on the right and left first incisors holding an accessory "tooth" in the medial diastema.

See the next section for more potentially individualizing health information.

Antemortem or pathological conditions. Both femora displayed expanded periosteal bone on the diaphyses, especially affecting the inferior length of the bones (Figures 5.118, 5.119, and 5.120). This morphology was consistent with chronic periostitis. The tibiae and fibulae were unaffected. The etiology of the periostitis is

Figure 5.118. *View of the Burial 67 left femur displaying expanded periosteal bone cracked away from the shaft.*

Figure 5.119. *View of the Burial 67 right femur displaying expanded periosteal bone encapsulating the shaft.*

[SENSITIVE CONTENT]

Figure 5.120. *Radiograph of the Burial 67 shaft of the right femur and the right tibia and fibula. The arrows indicate the periosteal bone "shell" on the femur.*

unknown, but could be due to primary or secondary hypertrophic osteoarthropathy. The former osteoarthropathy is a genetic condition. Secondary hypertrophic osteoarthropathy is associated with many conditions, including lung disease, cancer, cardiac issues, inflammation, and blood disorders. Poor preservation of these remains precluded examining other anatomy, such as the ribs and hands, for associated pathological changes.

Perimortem trauma. No evidence of perimortem trauma, or trauma associable with a cause of death, was observed in these remains.

Postmortem damage. Fragmentation of these remains was exacerbated by exhumation and transport. The state of preservation is consistent with prolonged burial.

DNA sampling. Twenty-five (25) teeth and both femoral diaphyses were submitted for DNA analysis (Figure 6.121).

Summary of conclusions and opinions. The individual in Burial 67 was a robust adult male, neither a young adult nor elderly. His stature, based on skeletal length in the burial, was approximately 66 inches. Preservation of his remains was fairly poor, precluding estimation of age or ancestry from his skeletal remains. He had an indicator of poor health, in that both femoral shafts displayed expanded periosteal bone, a state that can be associated with a variety of chronic lung or vascular diseases. He had a gold-colored bridge designed to fill the gap between the upper central incisors, which would have been observable during life.

The remains displayed lateral rotation of both femora. Postmortem rotation of the femora has been observed only in Burial 27. Decomposition of the remains prior to burial, and/or interaction of the pathological state of the femora with decomposition may be the shared variable, in addition to restricted water intrusion.

As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no trauma features classify him as a possible victim, or person of greater interest.

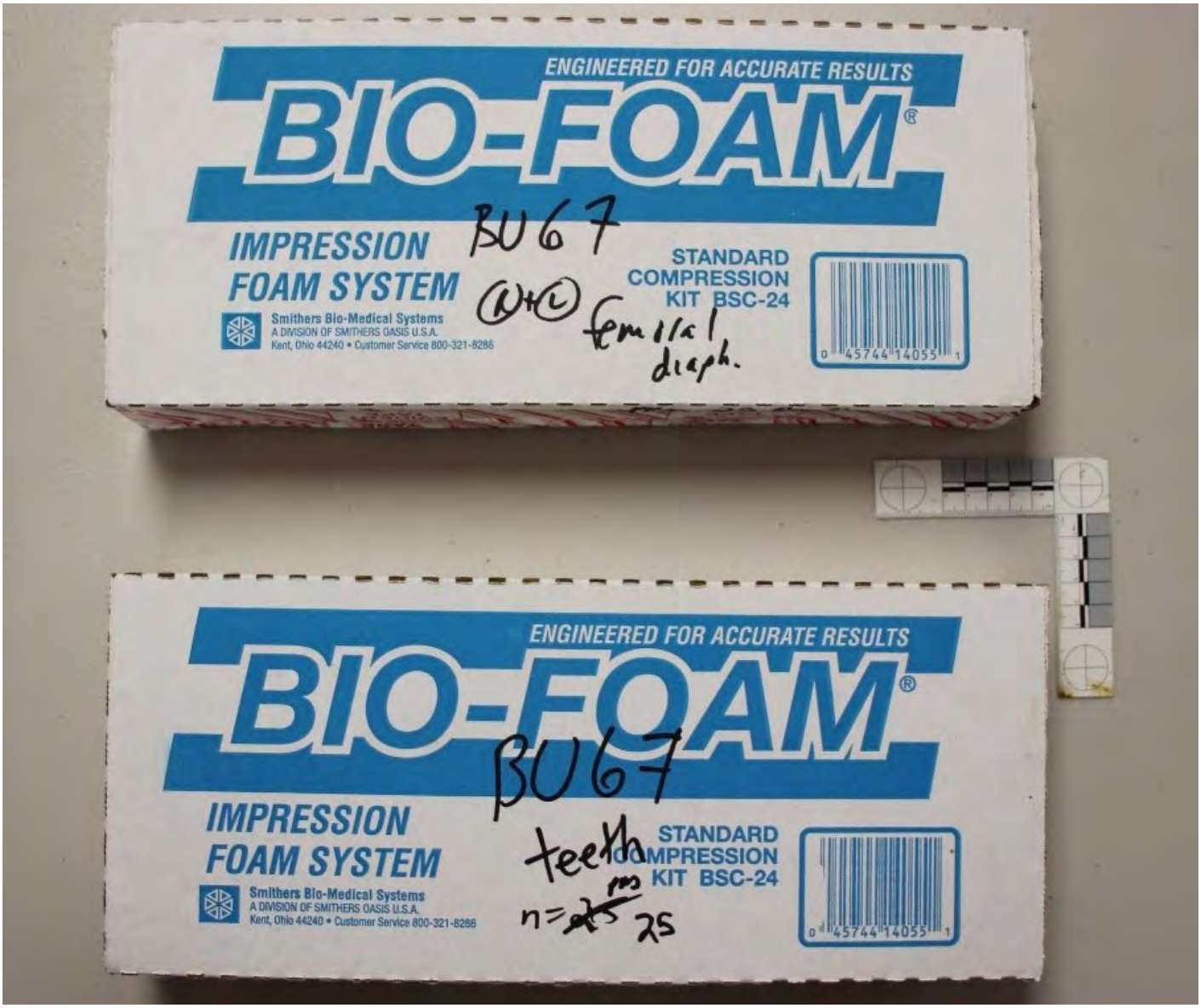


Figure 5.121. *Twenty-five (25) teeth and both femoral diaphyses from Burial 67 were sealed and submitted for DNA analysis.*

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 79
OAKLAWN UNKNOWN NUMBER: 28
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 744, 755, 756, 762-764, 823, 932-941, 1062, 1097

Condition of remains. In situ the remains appear somewhat disturbed, probably by water intrusion into the burial, with the torso and right shoulder displaced to the right of the hips (Figure 5.122). The feet were out of position, although the legs were in articulation. These skeletal remains were friable and very fragmentary after transport to the forensic laboratory (Figures 5.123, 5.124, and 5.125), especially the elements of the torso. The facial portion of the cranium was flattened and fragmentary. The vertebral bodies and rib ends were generally unobservable. The long bone diaphyses were generally present, but epiphyses were detached or disintegrated. The remains were earth-stained in color, and vegetation had invaded many elements. The preservation state of these remains is consistent with prolonged burial.

A strap loop or buckle (Figures 5.126 and 5.127) was recovered from the thoracic area of the remains. The burial shaft included a mass of unidentified ferrous material (Figure 5.128).

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were

skull (cranium and mandible)	right and left humeri
teeth #1 (root only), 2,5-6,7,7+,8-29,32, and an encrypted supernumerary	right and left ulnae
hyoid (body and right greater cornu)	right and left radii
thyroid cartilage (ossified)	right and left os coxae
right and left ribs	right and left femora
cervical, thoracic, and lumbar vertebrae	right and left tibiae
sacrum	right and left fibulae
right and left scapulae	manual and pedal elements

observed, and no elements of anomalous size or developmental stage were recovered.

After cleaning, representatives from the following classes of skeletal elements were present:

[SENSITIVE CONTENT]

Figure 5.122. *In situ overview of the Burial 79 remains.*

[SENSITIVE CONTENT]

Figure 5.123. *Overview of the top layer of the Burial 79 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.124. *Overview of the bottom layer of the Burial 79 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.125. *Overview of the Burial 79 remains after cleaning. The paper bags contain soil and small bone fragments.*

[SENSITIVE CONTENT]

Figure 5.126. *Radiograph of the Burial 79 thoracic area displaying a strap loop or buckle.*

[SENSITIVE CONTENT]

Figure 5.127. *The strap loop or buckle recovered from the thoracic area of Burial 79.*

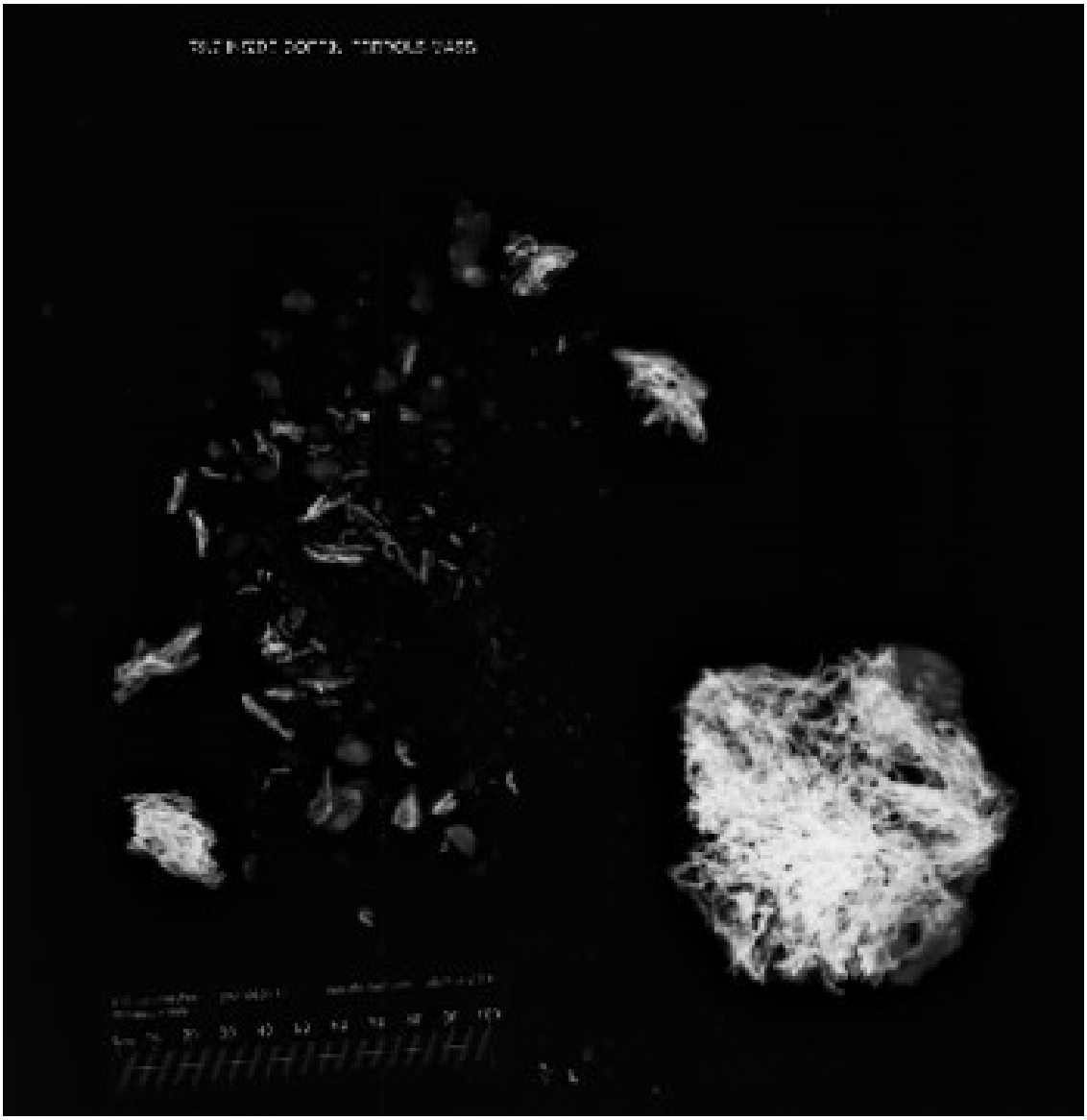


Figure 5.128. *Unidentified ferrous material recovered from the shaft fill for Burial 79.*

Sex. This individual was a biological male. Inspection of the cranium and os coxae revealed traits associated with male biological sex (Buikstra and Ubelaker 1994), including a robust nuchal crest, broad supraorbital margins, projecting glabella (eyebrow) region, and narrow sciatic notches (Figure 5.129). The appendicular skeleton was robust, and the femoral head diameter (46 mm) was consistent with a probable male (Thieme 1957 in Bass 2005).

Initial DNA analysis by Intermountain Forensics confirmed this sex assessment.

Ancestry. Despite fragmentation of the cranium, morphological traits preserved in the facial skeleton suggest this individual was of African descent, or African American. Preserved traits included a nasal aperture with a smooth inferior margin, a wide nasal aperture, and presence of a nasal gutter (Figure 5.130). Metric analysis was not conducted due to loss of sufficient cranial structures. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was an older middle-aged adult. Analysis of the left auricular surface (Figure 5.131) indicated it was in phase VI (Buckberry and Chamberlain 2002), which has a mean age of 66.71 years and an age range of 39-91 years. Osteoarthritic lipping was present on joints throughout the skeleton, including vertebrae, the humeral head, and femur. The right greater horn of the hyoid was fused to the body, and portions of ossified thyroid cartilage were recovered (Figure 5.132). These features of aging were consistent with an older middle-aged adult.

[SENSITIVE CONTENT]

Figure 5.129. *The right and left os coxae of Burial 79, displaying narrow sciatic notches (arrows).*

[SENSITIVE CONTENT]

Figure 5.130. *View of the Burial 79 maxillae, displaying the smooth inferior margin to the nasal aperture, a feature supportive of African ancestry.*

[SENSITIVE CONTENT]

Figure 5.131. *The auricular surfaces of the Burial 79 os coxae. The age related changes to these surfaces was consistent with older middle age.*

[SENSITIVE CONTENT]

Figure 5.132. *The Burial 79 hyoid and portions of ossified thyroid cartilage.*

Stature. This individual's stature was estimated using the maximum length of the humerus as 67.9 ± 3.5 inches at a 95% confidence interval, using the FORDISC (Jantz and Ousley 2005, version 3.1.322) 19th Century Black Male cadaver database. The formula used was 0.13387 * HUMXLN (336 mm) + 22.88 inches.

Individualizing traits or anomalies. This individual had two supernumerary teeth, one observable in life. He had two (2) right upper second incisors, one peg-shaped (Figure 5.133). There was an additional peg-shaped supernumerary tooth (Figures 5.134 and 5.135) encrypted above the left upper fourth premolar/first molar (teeth #13 and 14).

[SENSITIVE CONTENT]

Figure 5.133. *Anterior view of the Burial 79 maxilla, with arrow indicating the peg-shaped supernumerary right second incisor.*

[SENSITIVE CONTENT]

Figure 5.134. *Inferior view of the Burial 79 upper jaw, showing a broad dental arcade, the root of a third molar broken during life (black arrow), and an encrypted tooth (white arrow).*

[SENSITIVE CONTENT]

Figure 5.135. *The dissected Burial 79 supernumerary tooth encrypted behind teeth #13 and #14.*

Antemortem or pathological conditions. There was a cyst consistent with an apical abscess affecting teeth #7+ and #8, the peg-shaped supernumerary and the upper right central incisor (Figure 5.136).

Early loss of the lower right first and second molars led to increased wear on the left side dentition (Figure 5.137).

Perimortem trauma. No evidence of perimortem trauma or trauma associable with a cause of death was observed in these remains.

Postmortem damage. The state of these remains was consistent with prolonged burial. Exhumation and transport exacerbated fragmentation. After analysis was completed, the remains were bundled in preparation for reburial (Figure 5.138).

DNA sampling. Twenty-three (23) teeth and both femora were submitted for DNA analysis (Figure 5.139).

Summary of conclusions and opinions. The individual in Burial 79 was an older adult male of African descent, standing approximately 68 inches in height. One of his dental anomalies would have been observable in life, an extra right upper incisor. He also had an encrypted supernumerary tooth. There was an abscess above his right upper central incisor. There was no sign of trauma that might be associated with a cause of death. The state of his remains were consistent with prolonged burial.

[SENSITIVE CONTENT]

Figure 5.136. *Anterior view of the Burial 79 maxilla highlighting the apical abscess above the supernumerary right incisor #7 (arrow).*

[SENSITIVE CONTENT]

Figure 5.137. *The mandibular dentition of Burial 79, displaying significant antemortem tooth loss on the right side.*

Figure 5.138. *The bundled Burial 79 remains.*

Figure 5.139. *Both femora, the petrous temporals, and twenty-three (23) teeth from Burial 79 were sealed and submitted for DNA analysis.*

As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 84
OAKLAWN UNKNOWN NUMBER: 29
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 780, 827, 834-844

Condition of remains. In situ the remains appeared in articulation with hands crossed over the pelvis (Figure 5.140). The vault was collapsed on the left side and the facial skeleton slumped downward.

These skeletal remains were friable and very fragmentary after transport to the laboratory (Figures 5.141, 5.142, 5.143, and 5.144). The bones were earth-stained. Debris (glass shards, ceramics, a metallic mass) were recovered from the pelvic region, and wood fragments and nails, consistent with a coffin or wooden container burial, were recovered. Four (4) gold-colored crowns were observed in the upper dentition and burial fill (Figure 5.145). A probable pocket watch was recovered in the soil between the femurs (Figure 5.146). The fragmentary condition of these remains was consistent with prolonged burial.

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After cleaning, representatives from the following classes of skeletal elements were present:

skull (cranium and mandible)	right and left ulnae
teeth #1-11, 13, 15-17, 20-27	right and left radii
sternum (manubrium, gladiolus)	right and left os coxae
right and left ribs	right and left femora
cervical, thoracic, and lumbar vertebrae	right and left patellae
right and left scapulae	right and left tibiae
right and left clavicles	right and left fibulae
right and left humeri	manual and pedal elements

Sex. This individual was a probable biological male. Many of the skeletal indicators were intermediate in morphology (Buikstra and Ubelaker 1994). The sciatic notch was narrow (Figure 5.147), but cranial traits (nuchal crest, mastoid process size, orbital margins, glabella region;) were intermediate or feminine. Femoral and humeral head diameters were masculine, and the postcranial elements generally were robust with well-developed muscle

[SENSITIVE CONTENT]

Figure 5.140. *In situ overview of the Burial 84 skeletal remains.*

[SENSITIVE CONTENT]

Figure 5.141. *Overview of the first layer of Burial 84 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.142. *Overview of the second layer of Burial 84 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.143. *Lower body overview of the Burial 84 remains after cleaning. The bags contain soil and small bone fragments.*

[SENSITIVE CONTENT]

Figure 5.144. *Upper body overview of the Burial 84 remains after cleaning.*

[SENSITIVE CONTENT]

Figure 5.145. *Burial 84 anterior face with dentition.*

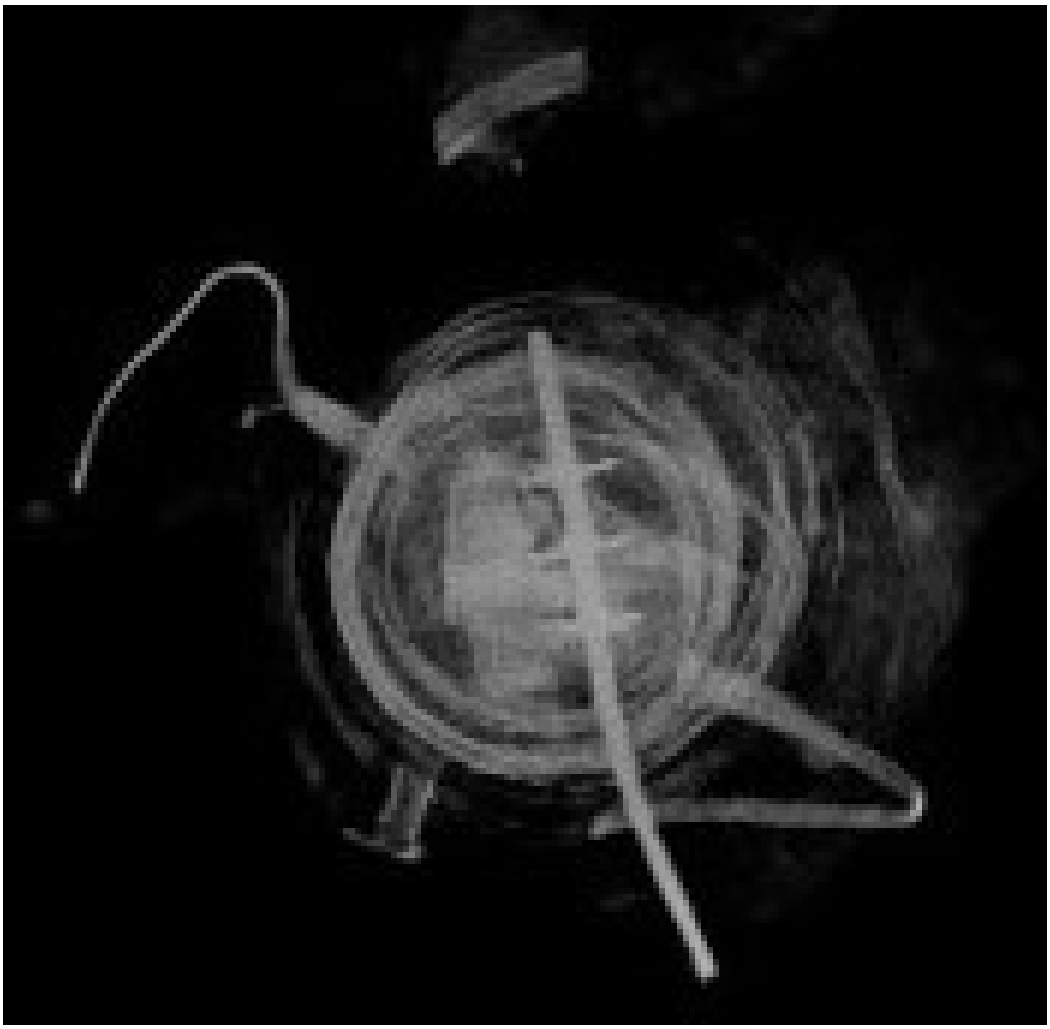


Figure 5.146. *Radiograph of Burial 84 probable pocket watch.*

[SENSITIVE CONTENT]

Figure 5.147. *Burial 84 ilia with a narrow sciatic notch on the left (white arrow), and arthritic lipping on the right iliac crest (black arrow).*

insertions on the humeri and femora. As the postcrania demonstrate sexual dimorphism more reliably than the cranium (Spradley and Jantz 2011), this individual was assessed as a probable male.

Initial DNA analysis by Intermountain Forensics confirmed male biological sex.

Ancestry. Due to poor preservation and fragility of the cranium, morphological and metric estimation of ancestry was indeterminate. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was a middle-aged older adult. Examination of the left pubic symphysis (Figure 5.148) based on the standards of Suchey-Brooks (1990) indicated Phase V morphology, which has a mean age of 45.6 years and a 95% confidence interval age range of 27 to 66 years. The upper end of this range is likely, based on the degree of lipping found on joints and right iliac crest, osteophytes on the thoracic vertebrae, and extensive tooth loss (Figures 5.149 and 5.150).

Stature. This individual's stature was estimated using the combined lengths of the calcaneus, femur, and tibia, as 65.4 ± 2.4 inches with a 95% confidence interval, using the FORDISC (Jantz and Ousley 2005; version 3.1.322) 19th Century Black Male cadaver database. The formula used was 0.04919 * CALCXL+FEMBLN+TIBXLN (904 mm) + 20.94 inches.

Individualizing traits or anomalies. This individual had four (4) gold-colored crowns on the upper right incisors, left central incisor, and left canine (see Figure 5.149). Specifically, teeth #7,8,9, and 11 were capped. The crown of tooth #10 was not recovered, although the root was in place.

Antemortem or pathological conditions. Signs of aging and an active lifestyle were observed in these remains. Indicators of periodontal disease were displayed. Calculus was adhered to the mandibular teeth, and the alveolar

[SENSITIVE CONTENT]

Figure 5.148. *Face of the Burial 84 left pubic symphysis, showing morphology consistent with older middle age.*

[SENSITIVE CONTENT]

Figure 5.149. *Burial 84 maxilla showing the four front teeth with gold-colored crowns, and remodeling socket for the left first premolar (arrow).*

[SENSITIVE CONTENT]

Figure 5.150. *Burial 84 mandible displaying multiple antemortem tooth loss, and eminent loss of the remaining teeth (shallow sockets) on the left side.*

margins had receded (see Figure 5.150). Cavities were present on the right upper canine and premolars and the left upper third molar (teeth #4-6 and #16). Several teeth were lost antemortem; the left upper first premolar was lost weeks before death, as the socket was remodeling (see Figure 5.149), and all of the lower right premolars and molars (see Figure 5.150) had been lost and their sockets fully remodeled.

A porous lesion was present on the right side of the frontal bone (Figure 5.151). This area was affected by root penetration, but the lytic lesion extends past the area of plant involvement. This lesion may be due to various etiologies, such as neoplasm, or infection such as syphilis. Porosity in the upper thoracic vertebrae may be related to a systemic pathological condition.

[SENSITIVE CONTENT]

Figure 5.151. *Burial 84 frontal lesion lateral view (arrow).*

The fourth cervical vertebra displayed a lesion penetrating the centrum (Figures 5.152 and 5.153). The fifth cervical vertebral body displayed osteophytosis and compression. The morphology of these two vertebrae was likely associated with a single compression event of the spine. Schmorl's nodes and osteophytes were developed throughout the thoracic and lumbar spine. Osteoathritic lipping was present on joints throughout the skeleton.

The right femur had a large enthesophyte on the medial surface, in the location of origin for vastus medialis and possibly the gastrocnemius (Figure 5.154). This enthesophyte probably derived from trauma or stress to the bone and muscle at this site.

Perimortem trauma. No perimortem trauma, or trauma associable with a cause of death, was observed in these remains.

Postmortem damage. The state of these remains was consistent with prolonged burial. Although fragmentation was common, several long bones survived exhumation and transport intact or nearly intact. After analysis was completed, the remains were bundled in preparation for reburial (Figure 5.155).

DNA sampling. Eleven (11) teeth, both petrous temporals, and both femurs were submitted for DNA analysis (Figure 5.156).

Summary of conclusions and opinions. The individual in Burial 84 was an older male of indeterminate ancestry. He had at least four gold-colored crowns on the anterior upper teeth, which would have been observable in life. A pocket watch was recovered with his remains. His body displayed signs of exertion and labor in the form

[SENSITIVE CONTENT]

Figure 5.152. *Inferior views of the Burial 84 fourth cervical vertebra displaying a penetrating lesion, and arthritic lipping surrounding the body margins.*

[SENSITIVE CONTENT]

Figure 5.153. *Superior views of the Burial 84 fourth cervical vertebra displaying a penetrating lesion, and arthritic lipping*

[SENSITIVE CONTENT]

Figure 5.154. *Burial 84 femora with large enthesophyte on the right femur.*

Figure 5.155. *The Burial 84 remains bundled for reburial.*

Figure 5.156. *Both femora, eleven (11) teeth, and both petrous temporals from Burial 84 sealed and submitted for DNA analysis.*

of arthritic lipping on most joints, compression of cervical vertebrae, and well-developed muscle insertions. Periodontal disease was displayed in the calculus, receding tooth sockets, multiple cavities, and numerous teeth lost in life. No trauma associable with a cause of death was observed in these remains, but the dental disease, porous lesion on the right frontal bone, and lesion on the fourth cervical vertebra suggest his health status was poor.

As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 95
OAKLAWN UNKNOWN NUMBER: 30
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 1063, 1082-1086

Condition of remains. The remains appeared articulated in situ, and generally in anatomical position (Figure 5.157). Long bones were splintering prior to exhumation; Butvar was applied to the larger femur and tibia fragments. These skeletal remains were very friable and fell into fragments during exhumation and transport to the forensic laboratory (Figure 5.158). Fragments of some epiphyses, ribs and vertebrae were observed. Dentition was present, generally as isolated teeth. The state of these remains is consistent with prolonged burial. The poor preservation was related to the age of the individual, which is described below.

Number of individuals. One (1) individual was represented by these remains (Figure 5.159). No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage are recovered.

After cleaning, representatives from the following classes of skeletal elements were present:

skull (cranium and mandible)	right and left radii
teeth #1-32 adult; deciduous #53	right and left os coxae
right and left ribs	right and left femora
cervical, thoracic, and lumbar vertebrae	right and left patellae
right and left scapulae	right and left tibiae
right and left clavicles	right and left fibulae
right and left humeri	pedal elements
right and left ulnae	

Sex. This individual was gracile, similar to female biological sex, but anatomical constraints described below indicated this individual could be prepubertal. The nuchal crest and supraorbital margins were feminine in morphology, but no pelvic or additional cranial traits were preserved.

Initial DNA analysis by our colleagues at Intermountain Forensics indicated this individual was male.

Ancestry. Due to the extreme fragility and fragmentary state of these remains, neither morphological nor metric analysis of ancestry was conducted. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was a subadult, a teenager 15 to 16 years old. The following open or fusing epiphyses were

[SENSITIVE CONTENT]

Figure 5.157. *Burial 95 in situ. The left femur and tibia were treated with Butvar.*

[SENSITIVE CONTENT]

Figure 5.158. *Overview of the Burial 95 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.159. *Post-cleaning overview of the Burial 95 remains. The bags contain soil and small bone fragments.*

observed: the basilar suture, humeral head, left ischial tuberosity, (Figures 5.160, 6.161, and 5.162) proximal tibia, and left femoral head. Referring to epiphyseal union data compiled by Schaefer et al (2009) the following male-age associations were observed:

Unfused/fusing proximal humerus	~15 years
Unfused ischial tuberosity	<15 years
Unfused/fusing femoral head	16-20 years
Fusing proximal tibia	~16 years

Based on the London Atlas (Al Qahtani et al, 2010), the open apices on an upper premolar and second molar, and crown-only development of the encrypted third molars, age was estimated at 12.5 to 15.5 years.

Stature. Skeletal length in burial was photogrammetrically measured from the crown of the cranium to the most distal point of the left heel area as 68.50 inches. Fragmentation precluded estimate of stature from bone measurements.

Individualizing traits or anomalies. This individual had retained a deciduous canine (tooth #53). The lateral maxillary incisors were nearly peg-shaped (Figure 5.163).

Figure 5.160. *The Burial 95 basioccipital, which was unfused to the sphenoid.*

Figure 5.161. *An unfused humeral head for Burial 95, displaying the billowy texture of the unfused growth plate (arrow).*

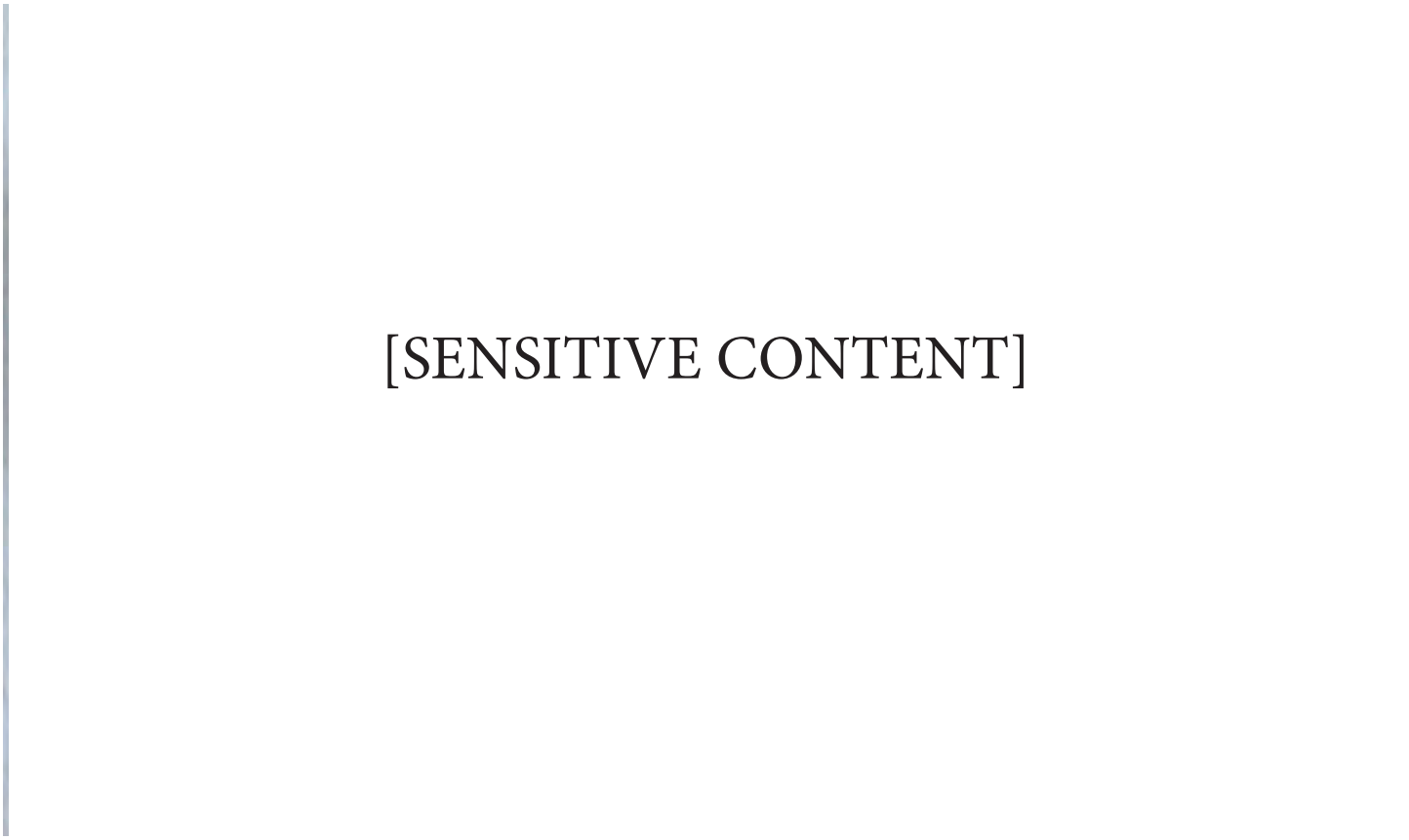


Figure 5.162. *The unfused Burial 95 ischial tuberosity, displaying the billowy texture of the unfused growth plate.*

Figure 5.163. *The Burial 95 left side dentition, including a retained deciduous canine (arrow).*

Antemortem or pathological conditions. A reactive lesion was noted on the endocranial surface of the frontal bone, left of the frontal crest (Figure 5.164). The etiology of this lesion is speculative, given the poor preservation of the remains.

Perimortem trauma. No evidence of perimortem trauma, or trauma associable with a cause of death, was observed in these remains.

Postmortem damage. The state of these remains was consistent with prolonged burial. Exhumation and transport exacerbated the fragmentation. After analysis was completed, the remains were bundled in preparation for reburial (Figure 5.165).

DNA sampling. The entire dentition (thirty-two (32) adult teeth and one (1) retained deciduous canine) and both petrous temporals were submitted for DNA analysis (Figure 5.166).

Summary of conclusions and opinions. The individual in Burial 95 was a young man 15-16 years of age. His biological sex was determined by DNA analysis by Intermountain Forensics. Preservation of his remains was poor,

[SENSITIVE CONTENT]

Figure 5.164. *Fragment of the Burial 95 frontal bone, displaying a lesion on the interior surface to the left of the internal crest (arrow).*

leading to a stature estimate based on skeletal length in burial, which was approximately 69 inches. The cranium and long bones were gracile and feminine in appearance, a morphology suggesting he had not completed puberty. He had a complete dentition, the third molar crowns were encrypted and not fully developed, and he retained a deciduous upper canine. In life his lateral incisors would have appeared small and peg-like in comparison to the central incisors. No evidence of trauma associable with a cause of death was observed in these remains. The state of preservation was consistent with prolonged burial for a young person with a developing skeleton.

As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

Figure 5.165. *Burial 95 bundle for reburial.*

Figure 5.166. *The entire dentition and both petrous temporals from Burial 95 were sealed and submitted for DNA analysis.*

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 99
OAKLAWN UNKNOWN NUMBER: 36
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 1015-1019

Condition of remains. These skeletal remains were extremely friable in situ and fragmented if brushed or touched (Figure 5.167). The skeletal elements were brown and earth-stained, surrounded by brown soil studded with sandstone pebbles. The state of preservation was consistent with prolonged burial, possibly for a longer period or in different soil conditions than in other burials recovered in Section 20.

Osteological analysis was restricted to the cranial area as the long bones were disintegrating during excavation and the likelihood of recovery of significant skeletal anatomy was very low. The skull area only was examined for sex or age indicators (Figure 5.168), as the remains appeared gracile. Nails were recovered with the cranial remains.

[SENSITIVE CONTENT]

Figure 5.167. *Overview of the Burial 99 overview in situ. The right femur was treated with Butvar.*

[SENSITIVE CONTENT]

Figure 5.168. *Burial 99 cranium intake overview.*

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered amongst these cranial elements.

After cleaning, representatives from the following classes of skeletal elements were present:

Teeth: fourteen (14) adult teeth (Figure 5.169).

Sex. Sex was estimated as a probable female based on the gracile state of the remains in situ. No cranial elements aside from teeth were preserved.

Ancestry. Ancestry was not estimated, as no cranial elements were recovered. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was an adult. The recovered dentition was adult and the molars displayed worn cusps.

Stature. Stature was not estimated.

Individualizing traits or anomalies. A gold-colored crown was recovered on tooth #9 (see Figure 5.169).

Antemortem or pathological conditions. No antemortem or pathological conditions were observed in this dentition.

Perimortem trauma. No perimortem trauma, or trauma associable with a cause of death was observed in these remains.

Postmortem damage. The state of these remains was consistent with prolonged burial. No identifiable skeletal elements were observed except for the teeth, although the general outline of human remains was observable in situ. The remains were disintegrating during exhumation and analysis. After analysis was completed, the remains were returned to the burial.

DNA sampling. No DNA sampling was conducted for these probable non-male remains.

Summary of conclusions and opinions. Burial 99 contained a probable female individual. Only teeth were recovered from these poorly preserved remains. Further excavation and exhumation was discontinued due to poor preservation and likelihood the individual was not male, and therefore not a member of the search population. A gold-colored crown was found on the left upper central incisor. The teeth, soil, and nails were returned to the burial immediately after analysis and no samples were submitted for DNA analysis.

[SENSITIVE CONTENT]

Figure 5.169. *The Burial 99 upper dentition which included a gold-colored crown on the left central incisor (tooth #9).*

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 101
OAKLAWN UNKNOWN NUMBER: 31
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 984-986

Condition of remains. In situ, the remains were predominately articulated and in anatomical position, with the arms along the sides rather than crossed over the torso (Figure 5.170).

During exhumation and transport to the lab, the remains proved to be friable and became very fragmentary (Figures 5.171, 5.172, and 5.173). The elements are earth stained. The burial soil was orangish and unlike previous soil exposures, although brown soil was retrieved with the remains. No elements were intact and the bones had a woody appearance. Rib, vertebrae, and pelvic elements were difficult to observe. The skull was fragmentary and collapsed. The long bones were fragmentary and their cortical bone was exfoliating. The state of these remains was consistent with prolonged burial.

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After cleaning, representatives from the following classes of skeletal elements are present:

skull (cranium and mandible)	right and left os coxae
teeth #1-32	right and left patellae
clavicle	right and left femora
cervical vertebrae	right and left tibiae
ribs	right and left fibulae
right and left humeri	manual and pedal elements
right and left ulnae	
right and left radii	

Sex. Biological sex was indeterminate from these skeletal remains due to fragmentation and poor preservation. Postcranial sites, including humeral epicondylar breadth, and femoral head diameter, were intermediate or feminine (Spradley and Jantz 2011). The linea aspera and deltoid tubercles were well-developed. However, the glabella region was well-developed and the mastoid process projected 37 mm, which are states associated with male biological sex.

Initial DNA analysis by Intermountain Forensics indicated that this individual is a biological male.

[SENSITIVE CONTENT]

Figure 5.170. *Burial 101 in situ overview.*

[SENSITIVE CONTENT]

Figure 5.171. *Overview of the top layer of the Burial 101 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.172. *Overview of the bottom layer of the Burial 101 remains upon arrival in the forensic laboratory*

[SENSITIVE CONTENT]

Figure 5.173. *Post clean up overview of the Burial 101 recovered remains. The bags contain soil and small bone fragments.*

Ancestry. Ancestry was not estimated due to fragmentation of the remains. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was an adult, based on the complete dentition (Figure 5.174), and enamel wear on the posterior dentition. No osteoarthritic development was observed on the preserved joint surfaces, which makes older adulthood unlikely.

Stature. Skeletal length in burial was measured photogrammetrically. The midline distance from the crown of the collapsed cranium to the most distal point of the left heel was 67.32 inches. Stature estimation from long bone measurements was not conducted due to poor preservation.

[SENSITIVE CONTENT]

Figure 5.174. *The dentition recovered from Burial 101, with upper teeth in the top row.*

Individualizing traits or anomalies. Radiopaque particles were observed near the mandible and the right arm, and an unidentified round object was recovered in the soil near the right arm (Figures 5.175, 5.176, and 5.177). The particle near the mandible was a flat fragment of white-metallic material, probably lead. In other burials, memorial "At Rest" plates were observed to degrade into flakes and particles. No plate was recovered with this burial. Contamination of backfill soil was not eliminated as a source of these particles, but weapons were not excluded as a source, as the particles were concentrated to the upper body.

Antemortem or pathological conditions. Dental calculus and caries were observed in the dentition (see Figure 6.174). Poor preservation of the remains restricted further observations of antemortem or pathological conditions.

Perimortem trauma. No evidence of perimortem trauma or trauma associable with a cause of death was observed in these very fragmentary remains.

Postmortem damage. The state of these remains was consistent with prolonged burial. After analysis was completed, the remains were bundled in preparation for reburial (Figure 5.178).

DNA sampling. Thirty (30) teeth, the right and left femurs, and the right and left temporal bones were submitted for DNA analysis (Figures 5.179 and 5.180).

[SENSITIVE CONTENT]

[SENSITIVE CONTENT]

Figure 5.176. *Radiograph of particles found near Burial 101 mandible. The indicated particle (pin) was observed as a flat metallic speck.*

Figure 5.175. *Radiograph of object found near the right arm of Burial 101.*

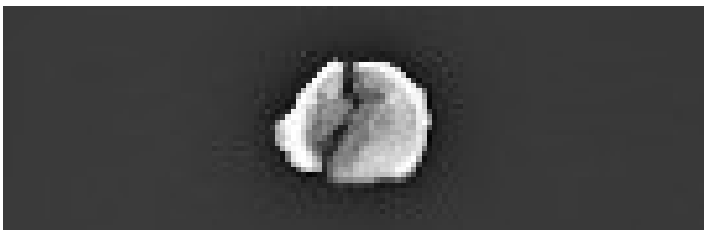


Figure 5.177. *Radiograph of unidentified object found near arm of Burial 101.*

Figure 5.178. *Burial 101 remains bundled for reburial.*

Figure 5.179. *Thirty (30) teeth from Burial 101 sealed and submitted for DNA analysis.*

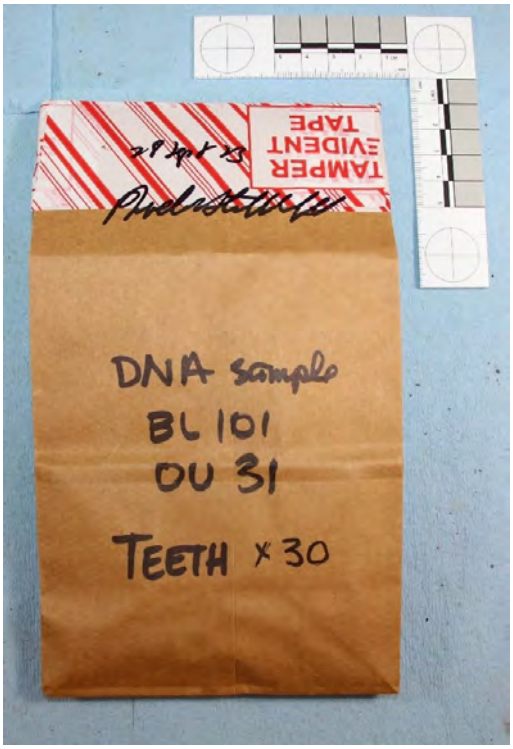


Figure 5.180. *Both femora and both petrous temporals from Burial 101 sealed and submitted for DNA analysis.*

Summary of conclusions and opinions. The individual in Burial 101 was an adult determined to be a biological male based on DNA analysis. Fragmentation and poor preservation of the remains limited observations of age, biological sex, ancestry, and stature. Skeletal length in the burial was approximately 67 inches. Radiopaque particles were observed in the soil associated with the right arm, and a round metallic object was recovered from this area as well. The mandible had a flat metallic particle in its adjacent soil. This particle was a white metal and resembled fragments derived from disintegrating coffin "At Rest" plates. However, other sources, including weapon-derived, for the radiopaque material in this burial were not excluded or identified. The fragmentary state of these remains was consistent with prolonged burial.

As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but the presence of the radiopaque particles in the soil, until determined to be debris in the grave fill, qualify him as a person of greater interest.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 118
OAKLAWN UNKNOWN NUMBER: 32
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 1044-1052

Condition of remains. In situ the skeletal remains were predominately in anatomical position, except for the left foot and rotation of the right lower limb (Figure 5.181). The arms were along the sides of the body rather than crossed over the torso.

Upon arrival in the forensic laboratory, these skeletal remains were fragmentary (Figures 5.182, 5.183, 5.184, and 5.185). The elements were earth-stained and roots have infiltrated. Large skeletal fragments with some attached epiphyses were present. The facial skeleton was not intact. Nails, a safety pin with fabric, and a pencil stub were recovered from the remains during the excavation, and an additional safety pin was recovered during analysis (Figures 5.186, 5.187, and 5.188). Vermiculite was scattered on the cranial area and thorax due to use as a transport cushion. The state of these remains was consistent with prolonged burial.

[SENSITIVE CONTENT]

Figure 5.181. *Burial 118 in situ overview, displaying alignment predominately in anatomical position.*

[SENSITIVE CONTENT]

Figure 5.182. *Overview of the top layer of Burial 118 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.183. *Overview of the top layer of Burial 118 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.184. *Overview of the bottom layer of Burial 118 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.185. *Overview of the Burial 118 remains after cleaning. The yellow bottle and white box contain artifacts recovered with the remains.*

[SENSITIVE CONTENT]

Figure 5.186. *Radiograph of a safety pin recovered from the Burial 118 remains.*

[SENSITIVE CONTENT]

Figure 5.187. *Radiograph of second safety pin recovered from the Burial 118 remains.*

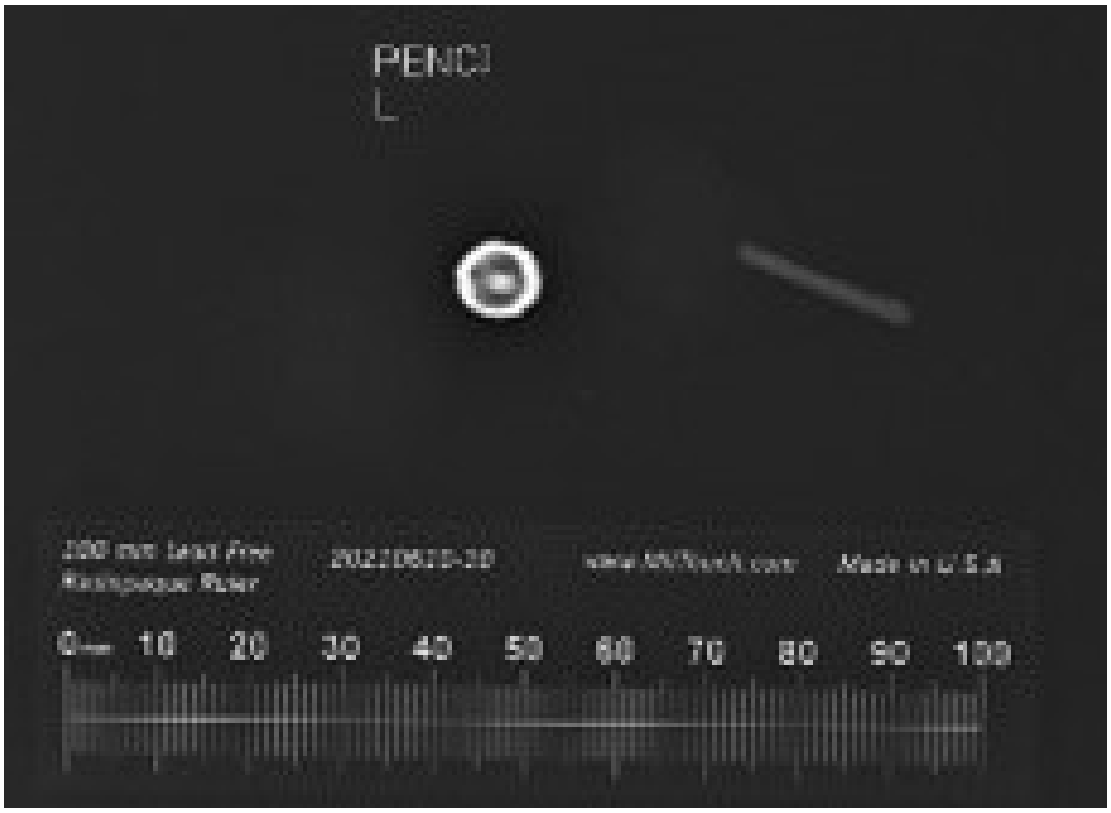


Figure 5.188. *Radiograph of the pencil ferrule and lead recovered with the Burial 118 remains.*

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After cleaning, representatives from the following classes of skeletal elements are present:

skull (cranium and mandible)	right and left ulnae
teeth #2-15, 17-32	right and left radii
sternum (manubrium)	right and left os coxae
right and left clavicles	right and left femora
right and left ribs	right and left patellae
cervical, thoracic, and lumbar vertebrae	right and left tibiae
right and left scapulae	right and left fibulae
right and left humeri	manual and pedal elements

Sex. This individual was a biological male. The pubic bone had a vertical anterior ridge (no ventral arc) and a linear attachment of the ischiopubic ramus to the pubic symphysis (no subpubic concavity; Figure 5.189). The greater sciatic notches were narrow (Figure 5.190).

Initial DNA analysis by our colleagues at Intermountain Forensics confirmed this assessment.

Ancestry. Due to fragmentation of the facial skeleton, ancestry was not estimated. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery.

Age. This individual was an adult in probably in his thirties. Age was estimated from the morphology of the pubic symphyses (see Figure 5.189), which were consistent with Suchey-Brooks phase IV (Brooks and Suchey 1990), which has a mean age of 35.24 and an age range of 23 to 57 years. The joint between the first and second sacral vertebrae was in the process of fusing. This joint can fuse well into the thirties. The glenoid fossae and acetabula were not lipped, and there was no osteophyte development in the vertebrae.

[SENSITIVE CONTENT]

Figure 5.189. *View of the Burial 118 pubic symphyses.*

[SENSITIVE CONTENT]

Figure 5.190. *The right and left os coxae from Burial 118, showing narrow sciatic notches*

Stature. This individual's stature was 69.0 ± 2.4 inches at a 95% confidence interval. Stature was estimated from the combined lengths of the femur, fibula and ulna, using the 19th Century Black Male database in FORDISC (Jantz and Ousley 2009 version 3.1.322). The formula used was 0.04127 * FEMXLN+FIBXLN+ULNPHL (1150 mm) + 21.59 inches.

Individualizing traits or anomalies. No physical anomalies or identifying features were observed. This individual was recovered with a pencil stub near the right hand.

Antemortem or pathological conditions. The dentition is nearly complete; no upper third molars were recovered. Enamel wear has resulted in exposed dentin on all preserved teeth (Figures 5.191 and 5.192), but only one cavity was noted, on tooth #2. Alveolar resorption was present at the sockets of the mandibular third molars, which suggests dental care to these teeth was deficient, although other causes were not excluded.

Both first metatarsals exhibit a central defect on the distal articular surface (Figure 5.193). This defect is characteristic of osteochondritis dissecans, which could derive from several etiologies, including repetitive stress to the joint, vitamin D deficiency, or genetic predisposition.

Perimortem trauma. No evidence of perimortem trauma or trauma associable with a cause of death was observed in these remains.

[SENSITIVE CONTENT]

Figure 5.191. *View of the Burial 118 maxillary dentition. No third molars were recovered.*

[SENSITIVE CONTENT]

Figure 5.192. *View of the Burial 118 mandibular dentition. The sockets around the third molar are enlarged by resorption.*

[SENSITIVE CONTENT]

Figure 5.193. *View of the heads of the Burial 118 first metatarsals, displaying defects consistent with osteochondritis dissecans.*

Postmortem damage. The state of these remains was consistent with prolonged burial. Exhumation and transport exacerbated the fragmentation. After analysis was completed, the remains were bundled in preparation for reburial (Figure 5.194).

DNA sampling. Thirty (30) teeth and the right and left femurs were submitted for DNA analysis (Figure 5.195).

Summary of conclusions and opinions. The individual in Burial 118 was a robust male of unknown ancestry, in his thirties. His stature was approximately 69 inches. He had a nearly complete dentition except for the upper

Figure 5.194. *View of the Burial 118 bundled remains.*

Figure 5.195. *Thirty (30) teeth and both femora from Burial 118 were sealed and submitted for DNA analysis.*

third molars, and had one cavity. Moderate enamel wear had exposed the dentin on all teeth. The majority of the recovered skeleton lacked signs of arthritic changes. The first metatarsals exhibited osteochondritis dissecans on the distal articular surface, a condition that derives from various etiologies. The fragmentary state of his remains was consistent with prolonged burial. In addition to two safety pins, fabric was recovered with one of the pins. A pencil stub was recovered near his right hand.

As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBER: 119
OAKLAWN UNKNOWN NUMBER: 33
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 1064-1071

Condition of remains. The remains were positioned with the head facing west in the burial, and large debris items were found in the fill (Figure 5.196). The cranium and some long bones were nearly intact.

After exhumation and transport to the laboratory, these skeletal remains were very fragmentary (Figures 5.197 and 5.198). Preservation of the remains was consistent with prolonged burial, as the remains were earth-stained and had root infiltration. Cortical flaking and disintegration of epiphyses were common.

Number of individuals. One (1) individual was represented by these remains. No duplicate skeletal elements were observed, and no elements of anomalous size or developmental stage were recovered.

After cleaning, representatives from the following classes of skeletal elements are present:

skull (cranium and mandible)	right and left ulnae
teeth #1-16, 18, 20-29, 32	right and left radii
sternum (gladiolus)	right and left os coxae
right and left clavicles	right and left femora
right and left ribs	right and left patellae
cervical, thoracic, and lumbar vertebrae	right and left tibiae
right and left scapulae	right and left fibulae
right and left humeri	manual and pedal elements

[SENSITIVE CONTENT]

Figure 5.196. *In situ overview of the BL 119 remains, displaying disarrayed skeletal remains and debris.*

[SENSITIVE CONTENT]

Figure 5.197. *Overview of the Burial 119 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.198. *Overview of the Burial 119 remains after cleaning. The cranium collapsed. The bags contain soil and small bone fragments. The vial contains an unidentified metallic object.*

Sex. This individual was a biological female. The greater sciatic notch was wide, the glabella region is flat, and the mastoid processes are small, states which are associated with biological female sex (Figures 5.199 and 5.200; Buikstra and Ubelaker 1994). Femoral head diameters were 39 and 37 mm, which is consistent with female sex (Spradley and Jantz, 2011).

Initial DNA analysis by Intermountain Forensics confirmed this assessment.

Ancestry. This individual was of African descent, based on assessment of non-metric traits. The cranium displayed (see Figures 5.199 and 5.200) maxillary prognathism, lack of a nasal sill, and presence of a nasal gutter, traits which have high frequencies in African American populations. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery. Metric analysis was not conducted due to plastic deformation of the facial skeleton.

Age. This individual was an adult, probably in her thirties or forties. The medial clavicles are fused, and the auricular surfaces indicated phases 4 and 5, which have mean ages of 47.8 and 53.1 years, respectively, with age ranges from the twenties to early eighties (Osborne et al., 2004). Lipping on the fovea capitis was minimal, and no other arthritic changes were observed on the preserved joint surfaces, which indicated this individual was not an older adult. Most of the lower molars were lost in life, despite dental care, but this individual was more likely in her thirties and forties than older.

Stature. This individual's stature was estimated from femoral length as 63.0 ± 2.9 inches at a 95% confidence interval, using the FORDISC 19th Century Black Female sample (Jantz and Ousley 2009, version 3.1.322). The formula used was 0.08996 * FEMXLN (431 mm) + 24.18 inches.

[SENSITIVE CONTENT]

Figure 5.199. *Lateral view of the Burial 119 cranium, displaying the projecting maxilla and the small mastoid process (arrow).*

[SENSITIVE CONTENT]

Figure 5.200. *Oblique anterior view of the facial skeleton from Burial 119, displaying a wider nasal aperture and lack of a nasal margin.*

Individualizing traits or anomalies. This individual had several dental restorations. Gold-colored crowns were present on the upper central and left lateral incisors (Figure 5.201). A gold-colored filling was present on the mesial interproximal contact facet for tooth #7, the right upper lateral incisor. A dark radiopaque occlusal filling is present on tooth #18, the left lower second molar.

A corroded metallic object similar to a shallow container, was recovered from the soil in the thoracic area (Figure 5.202). An unknown circular felt-like mass was adhered to the linea aspera of the left femur (Figure 5.203), but fell away during analysis and was not identified.

[SENSITIVE CONTENT]

Figure 5.201. *The upper front teeth from Burial 119, displaying the gold-colored crowns on the middle and lateral incisors. The arrow indicates the gold-colored filling on the right second incisor.*

[SENSITIVE CONTENT]

Figure 5.202. *Radiograph image of the Burial 119 thoracic area. It was identified a shallow container, a possible bottle cap.*

[SENSITIVE CONTENT]

Figure 5.203. *Left femur from Burial 119 with an unidentified circular mat on the mid-shaft.*

Antemortem or pathological conditions. Caries were located on teeth #5, 6, 7, and 16. No other antemortem or pathological conditions were observed on these remains.

Perimortem trauma. No evidence of perimortem trauma, or trauma associable with a cause of death, was observed in these remains.

Postmortem damage. The preservation state of these remains was consistent with prolonged burial. The burial fill held several large debris items, including pot sherds and bricks (see Figure 5.196).

After analysis was completed, the remains were bundled in preparation for reburial (Figure 5.204).

DNA sampling. Nineteen (19) teeth and the right and left femurs were submitted for DNA analysis (Figure 5.205).

Figure 5.204. *Overview of the Burial 119 bundled for reburial.*

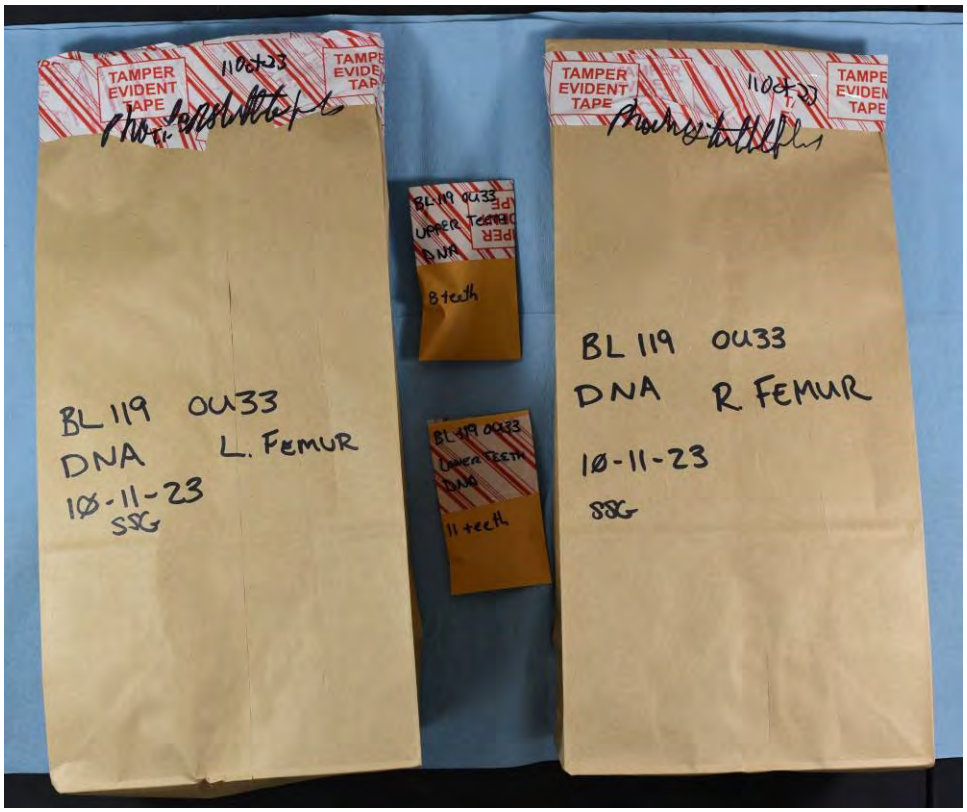


Figure 5.205. *Samples from Burial 119 consisting of both femora and nineteen (19) teeth were sealed and submitted for DNA analysis.*

Summary of conclusions and opinions. The individual in Burial 119 was an adult female, possibly in her thirties or forties. Her cranial morphology indicated African ancestry. Her stature as approximately 63 inches. Despite losing most of her lower molars, dental care was a priority as this person had three gold-colored crowns, a gold filling, and an occlusal metallic filling. An unidentified metallic object similar to a shallow container, was found in her thoracic area. No evidence of trauma associable with a cause of death was observed on these remains. The postmortem state of these remains was consistent with prolonged burial. Atypically, her remains were positioned with her head facing west, and large debris such as bricks, were included in her burial fill.

Despite recovery from a plain casket, this individual is excluded from classification as one of the documented Tulsa Race Massacre victims, due to her female biological sex.

TULSA RACE MASSACRE INVESTIGATION BURIAL NUMBERS: 124A and 124B
OAKLAWN UNKNOWN NUMBER: 34 and 35, respectively
UNIVERSITY OF OKLAHOMA CATALOG NUMBER: 926, 927, 1080, 1081, 1090-1095, 1098-1101

Condition of remains. In situ the remains are predominately articulated with the right arm crossed over the torso (Figure 5.206). The right femur was damaged during a previous season of the Oaklawn investigation which involved core sampling.

The skeletal remains were very fragmentary upon arrival to the forensic laboratory (Figures 5.207, 5.208, 5.209, 5.210, 5.211). The remains were earth-stained and exhibited crushing and fragmentation of the epiphyses. Infant or fetal remains were recovered between the adult tibiae (Figure 5.212).

A layer of brown scabrous matter coated the anterior surfaces of the distal left femur and the right and left tibiae and fibulae (Figure 5.213). This matter was unidentified, and made a uniform layer that did not extend past

[SENSITIVE CONTENT]

Figure 5.206. *In situ overview of the Burial 124 remains. The remains are predominately articulated with the right arm crossed over the torso. The right femur was damaged during a previous site survey.*

[SENSITIVE CONTENT]

Figure 5.207. *Overview of the top layer of the Burial 124 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.208. *Overview of the second layer of the Burial 124 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.209. *Overview of the third layer of the Burial 124 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.210. *Overview of the fourth and final layer of the Burial 124 remains upon arrival in the forensic laboratory.*

[SENSITIVE CONTENT]

Figure 5.211. *Overview of the Burial 124 remains after cleaning. The bags contain soil and small bone fragments. The white box in the upper right hand corner contains fetal remains. The vials contain samples of matter from the lower legs, and artifacts recovered from the torso.*

[SENSITIVE CONTENT]

Figure 5.213. *Subadult remains and wood fragments recovered from between the Burial 124A adult lower legs.*

[SENSITIVE CONTENT]

Figure 5.214. *The Burial 124A left femur and both tibiae, coated with a layer of brown scabrous matter.*

Number of individuals. Two (2) individuals were represented by these remains. Elements in two different developmental stages, adult and juvenile, were recovered. The adult individual was designated 124A, and the juvenile 124B.

After cleaning, representatives from the following classes of 124A skeletal elements were recovered:

skull (cranium and mandible)	right and left ulnae
teeth # 1, 3-16, 21-28, 31	right and left radii
sternum (manubrium, gladiolus)	right and left os coxae
right and left clavicles	right and left femora
right and left ribs	right and left patellae
cervical, thoracic, and lumbar vertebrae	right and left tibiae
right and left scapulae	right and left fibulae
right and left humeri	manual and pedal elements

After cleaning, representatives from the following classes of 124B skeletal elements were recovered:

a femoral diaphysis
left petrous temporal
possible vertebral centra

Sex. The 124A individual was a biological male. The greater sciatic notch was narrow (Figure 5.214), a trait consistent with male biological sex (Buikstra and Ubelaker 1994). The femoral head diameter was 48 mm, which is consistent with male sex (Spradley and Jantz 2011). Finally, the pubic symphysis anatomy exhibited a vertical ventral profile, broad ischiopubic ramus, and lack of an ischiopubic ridge (Figure 5.215), traits consistent with male sex (Phenice 1969).

Initial DNA analysis by Intermountain Forensics confirmed this assessment.

Sex was not identified for the 124B remains, due to poor DNA preservation.

Ancestry. The 124A individual was probably of African descent. The cranial anatomy displayed maxillary prognathism, no nasal sill, and a wide nasal aperture (Figure 5.216). Metric analysis was not conducted. Race of this individual was likely "Black" as the remains were recovered from the Colored Potters Field of Oaklawn Cemetery.

Ancestry was not estimated for the 124B remains.

Age. The 124A individual was an older adult, possibly in his sixties, based on morphology of the pubic symphysis (Figure 5.217) and degenerative changes in the vertebral column. The left pubic symphysis was consistent with Phase V, which has a mean age of 45.6 years and a 95% confidence interval age range of 27 to 66 years (Brooks and Suchey 1990). The upper end of this range is the likely age due to the arthritic lipping and osteophyte development on the ribs and vertebrae, respectively.

The age of the 124B material was estimated from femoral diaphyseal length (Fazekas and Kosa, 1978) to approximately 28 weeks, or fetal age.

Stature. Skeletal length in burial of the adult was measured photogrammetrically from the crown of the cranium to the sole area of the left foot at 66.54 inches. Fragmentation prevented estimation of stature from skeletal elements. Body length was not estimated for the fetal remains.

[SENSITIVE CONTENT]

[SENSITIVE CONTENT]

Figure 5.214. *The left ilium from Burial 124A, displaying a narrow sciatic notch.*

Figure 5.215. *The pubic symphyses from Burial 124, displaying broad ischiopubic rami, a masculine trait. This image was brightened by 20% in Microsoft Word.*

[SENSITIVE CONTENT]

Figure 5.216. *Anterior view of the Burial 124 cranium, showing a wide nasal aperture and lack of a nasal sill.*

[SENSITIVE CONTENT]

Figure 5.217. *The right pubic symphysis of Burial 124A, showing a complete rim and porosity in the upper face, features associated with older individuals.*

Individualizing traits or anomalies: Six (6) matching buttons and the head of a safety pin were recovered from the torso area (Figure 5.218). The buttons were brown and had four holes.

Antemortem or pathological conditions. Antemortem tooth loss with significant remodeling was displayed on the left mandible, demonstrating loss of the fourth premolar and all molars on this side (Figure 5.219). Tooth loss had occurred on the right side of the mandible as well, affecting the first and third molars. The left mandibular bone is well preserved despite the tooth loss on the left; it is possible this man used dentures. The left maxillary molars projected downward as a result of the loss (Figure 5.220).

Arthritic changes, including lipping and osteophyte development on vertebrae, were present throughout the skeleton.

No evidence of antemortem trauma or pathological conditions were observed in the limited fetal elements recovered.

Perimortem trauma. No evidence of perimortem trauma, or trauma associable with a cause of death, was observed in either set of remains.

Postmortem damage. The state of these remains was consistent with prolonged burial. The right femur was damaged in the 2021 field season during core sampling. After analysis was completed, the remains were bundled in preparation for reburial (Figure 5.221).

Figure 5.218. *Buttons and the head of a safety pin recovered from the torso area of Burial 124A.*

[SENSITIVE CONTENT]

Figure 5.219. *Upper and lower dentition from Burial 124A, displaying significant losses of the lower molars.*

[SENSITIVE CONTENT]

Figure 5.220. *Lateral view of the Burial 124 cranium, showing the downward projection of the left upper molars.*

DNA sampling. Seventeen (17) teeth, the right and left femora, and all fetal elements were submitted for DNA sampling (Figure 5.222).

Summary of conclusions and opinions. The remains contained in Burial 124 consisted of an older adult male possibly in his sixties and a 28-week old fetus. The adult had a stature of approximately 66 inches. He had experienced extensive lower tooth loss, and arthritic development throughout the skeleton. No life history information aside from age was obtained from the fetal remains. No signs of perimortem trauma or trauma associable with a cause of death were observed in either set of remains. Six (6) matching buttons and the head of a safety pin were recovered from the torso area of the adult.

The scabrous material coating the distal femur and the lower legs is likely associated with the fetal remains recovered between the adult's lower legs, and is likely the decomposed remnant of a bundle or wrapper for the fetal remains.

As a male in a plain casket, this individual is not excluded from classification as a Tulsa Race Massacre victim, but no features of the burial classify him as a possible victim, or person of greater interest.

Figure 5.221. *The Burial 124A remains bundled for burial. The 124B fetal remains were submitted for DNA analysis..*

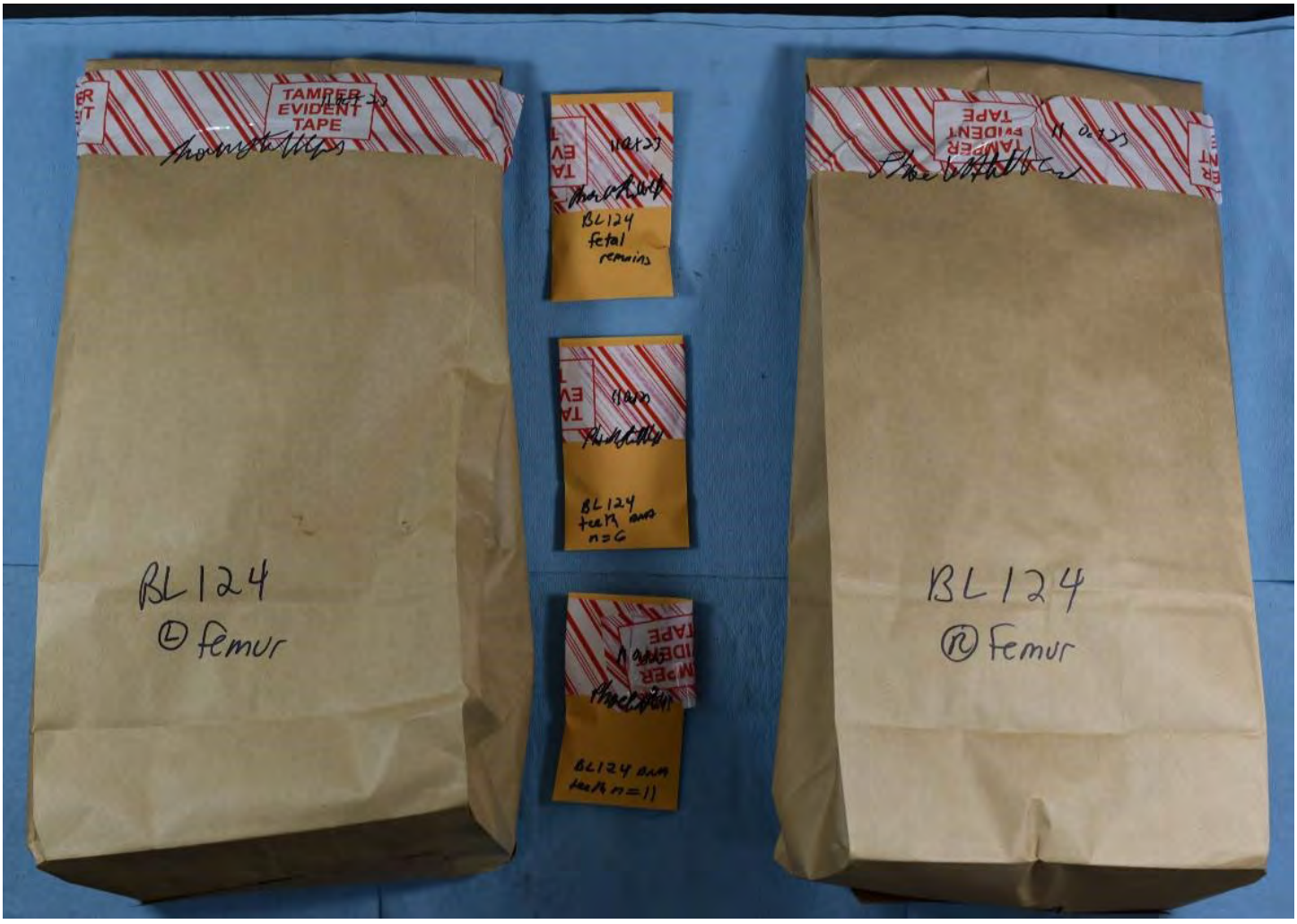


Figure 5.222. *Both femora and seventeen (17) teeth from Burial 124A, and the total 124B fetal remains sealed and submitted for DNA analysis.*

Biological Profile Summary

Seventeen sets of individual remains were examined during the 2022 and 2023 investigation seasons (Table 5.3). Ten sets of remains were from males, five from females, and two from individuals of indeterminate biological sex.

This reporting benefited from having initial DNA results determining biological sex become available before collation of the final report. Our methods of determining biological sex from these skeletal remains, despite the poor preservation, were robust. In eleven individuals, determination of biological sex agreed between the skeletal and genetic techniques. Four individuals who were of indeterminate skeletal sex due to fragmentation and or presentation of intermediate indicators were identified genetically as males. No contradictory biological sex estimates occurred. The remaining individuals were either not submitted to DNA analysis (BL #99) or did not yield sufficient DNA to determine sex (BL 124B). These results also support inclusion of gracile or non-robust individuals buried in plain caskets for exhumation.

Burials of Interest

Two (2) individuals demonstrated features of interest for classification as possible victims of the race massacre, Burial 42 and Burial 101 (Table 5.4). Burial 42 had a cranial gunshot wound. Burial 101 had anomalous white metal particles in association with the right arm.

Burial 45 is included as a burial of interest, due to possible thermal damage to the left hand. Although this damage could be due to rub from the coffin lid, the orientation of the remains shows that the burial container was not sized to this individual, causing the head to be angled into a corner. Poor fit implies hasty burial, disrespect toward the deceased, limited coffin choices, or combinations of variables. Identification will be required to confirm if burials like 45 are race massacre victims, unless a cohort of suitable burials displaces it from consideration.

The other male burials remain in the "not excluded" category, although some present poor health indicators that may relate to the cause of death. These individuals are not excluded, as Burial 42, the gunshot wound victim, also had poor health indicators. All female burials are excluded from victim status (Table 5.5).

This report brings the total number of gunshot wound victims recovered from Section 20 of Oaklawn Cemetery to two (2), both males in Burials 27 and 42. These burials derived from the Original 18 area, as opposed to the Clyde Eddy area. Yet, the latter area produced a burial of interest, 101, which had metallic particles near the right arm and mandible.

The death certificate data indicates that thirteen males had gunshot wound deaths, and four had burn related deaths (Table 5.6). Gunshots that do not hit bone, or where the bullets are not retained in a soft tissue injury, will not be detected, but based on the preservation environment, a successful exhumation cohort will demonstrate multiple males with gunshot wound evidence. The "not excluded" males are not included in the count of possible TRM victims, and will require identification in order to be classified as victims.

No definite victims of thermal damage have been acquired, although Burial 45 is suggestive. Severely burned bodies retract into the pugilistic pose, and at least one victim was burned that severely according to historical images from the race massacre. An individual buried in this position might be interred on his side, or have clenched fists which has not been observed in the male burials. Our review of the burial positions of all exhumed individuals since 2021 (except for Burial 01), has shown supine (face up) positioning, with hands crossed over torso or lying along the sides. Female burials have more disarrangement from water intrusion (Burials 16, 28, and 119). Male burials are generally in anatomical position except for rolling of the lower leg, but all of the cornered-head burials (Burials 19, 45, and possibly 84) are male. Burial 67 is unique for having two rotated femurs, but this feature may be due to the pathological state of those bones, which were heavily modified by periostitis. Rotated femurs are not common in our sample, but is seen unilaterally in Burial 27 as a full rotation, and partial rotations in Burials 03 and 30. Burial 42 is unique for its bloated positioning. In summary, the body positions have been informative in the degree of preservation, but have not demonstrated pugilistic posing.

Table 5.3. Summary Biological Profile Data for the Exhumed Burials

Burial Number	Biological Sex	Age	Stature	Individualizing Traits	Health Conditions	Trauma Associated w/ Cause of Death	Postmortem Damage
36	Male	12-15 years	Undetermined	None Observed	None Observed	None Observed	None Observed
39	Male	Middle Aged	65.4 +/- 4.4 inches	Edentulous	None Observed	None Observed	None Observed
40	Female	20s-30s	67.71 inches	Gold Tooth	None Observed	None Observed	None Observed
41	Male	Middle Aged	67.9 +/- 3.3 inches	Buried with gold ring	sinus infections; possible infection	None Observed	None Observed
42	Male	Young Adult	65.75 inches	pocket knife, keys, Left shoe	leg periostitis	GSW to cranium	None Observed
45	Male	<25 years	70.47 inches	Gold tooth	None Observed	None Observed	possible thermal damage
65	Female	Middle Aged	64.96 inches	Peg shaped tooth, additional cusps on tooth	None Observed	fractured left femur, fractures to thoracic, lumbar, and sacral vertebrae	None Observed
67	Male	Adult	65.74 inches	gold colored dental bridge	leg periostitis	None Observed	None Observed
79	Male	Older Adult	67.9 +/- 3.5 inches	supernumerary and peg-shaped teeth	None Observed	None Observed	None Observed
84	Male	Older Adult	65.4 +/- 2.4 inches	four gold colored crowns	possible infection	None Observed	None Observed
95	Male	15-16 years	68.50 inches	teeth #7 & #10 were peg shaped	None Observed	None Observed	None Observed
99	Probable Female	Adult	Undetermined	gold colored crown	None Observed	None Observed	None Observed
101	Male	Adult	67.32 inches	metallic particles near arm	None Observed	None Observed	None Observed
118	Male	30s	69.0 +/- 2.4 inches	None Observed	osteochondritis dissecans on both first metatarsals	None Observed	None Observed
119	Female	30s - 40s	63.0 +/- 2.9 inches	gold colored crowns; dark occlusal filling	None Observed	None Observed	None Observed
124A	Male	Older Adult	66.54 inches	six (6) matching brown buttons	None Observed	None Observed	None Observed
124B	Indeterminate	28-week fetus	Undetermined	None Observed	None Observed	None Observed	None Observed

Table 5.4. Possible Tulsa Race Massacre Victim or Burial of Interest.

Burial Number	Sex	Trauma or Features of Interest
42	M	cranial gunshot wound
45	M	possible thermal damage to hand
101	M	metallic particles near humerus

Table 5.5. Potential Victim Status for All Exhumed Burials.

Burial Number	Sex	Trauma or Features of Interest	Included as possible victim	Not excluded as possible victim	Excluded as victim
36	M	none		X	
39	M	none		X	
40	F	none			X
41	M	none		X	
42	M	cranial gunshot wound	X		
45	M	possible thermal damage to hand	X		
65	F	blunt force trauma			X
67	M	none		X	
79	M	none		X	
84	M	none		X	
95	M	none		X	
99	F	none			X
101	M	metallic particles near humerus	X		
118	M	none		X	
119	F	none			X
124A	M	none		X	
124B	I	none			X

Table 5.6. Documented Race Massacre Derived Burials and Cause of Death

Name	Cause of Death	Place of Burial
Adams, Ed	gunshot wound	Tulsa (Oaklawn)
Alexander, Greg	gunshot wound	Tulsa (Oaklawn)
Howard, Ed	gunshot wound	Tulsa (Oaklawn)
Jeffrey, George	gunshot wound	Tulsa (Oaklawn)
Lewis, ?	gunshot wound	Tulsa (Oaklawn)
Miller, Joe	gunshot wound	Tulsa (Oaklawn)
Ree, Sam	gunshot wound	Tulsa (Oaklawn)
Turner, William	gunshot wound	Tulsa (Oaklawn)
Unidentified	gunshot wound	Tulsa (Oaklawn)
Unidentified	unknown	Tulsa (Oaklawn)
Unidentified	burns	Tulsa (Oaklawn)
Unidentified	burns	Tulsa (Oaklawn)
Unidentified	burns	Tulsa (Oaklawn)
Unidentified	gunshot wound	Tulsa (Oaklawn)
Unidentified	burns	Tulsa (Oaklawn)
Unidentified	gunshot wound	Tulsa (Oaklawn)
Walker, Curley	gunshot wound	Tulsa (Oaklawn)
Walker, Henry	gunshot wound	Tulsa (Oaklawn)

Our recommendation is to continue excavating the Original 18 area, extending east and west, and south under the tree, and to complete the geophysical survey of the Canes area. In light of the pending change in mayoral leadership, we recommend continuing to encourage the descendant community by disseminating the search results, expanding on the reconstruction of the cemetery history, and continuing to share the results of the genealogical analysis.

CHAPTER 6

SUMMARY FINDINGS AND RECOMMENDATIONS

Kary L. Stackelbeck and Phoebe R. Stubblefield

The previous chapters of this report and the appendices present detailed descriptions of the methods employed to expand the search for victims of the 1921 Tulsa Race Massacre in Oaklawn Cemetery during the 2022-2023 field seasons, as well as the various analyses and results. Excavations in the Original 18 Area were conducted to increase the likelihood of encountering additional individuals who fit our target profile—adult male trauma victims buried in simple wooden caskets. This target profile does not preclude consideration of other individuals as potential victims, but it provides our team with a historical framework to discriminate those burials that are most likely to be potential Massacre victims and warrant exhumation and forensic analyses.

Excavation Blocks B and C were completed in October 2022; Block D was excavated in September 2023 (see Figure 4.1). Thirty-nine graves were recorded in these three blocks. Eight individuals from unmarked graves in Block B and three individuals from unmarked graves in Block D were exhumed and analyzed in the on-site forensic laboratory (see Figure 4.1). One of the individuals exhumed in Block B—Burial 42—suffered a gunshot wound to the head. Seven other burials remain of interest because they partially meet the search parameters.

Additionally, we pursued a credible lead provided by Clyde Eddy, albeit in a different location than that which he recounted at other times to previous investigative team members. Excavations in this new Clyde Eddy location did not reveal a trench-style mass grave feature as Mr. Eddy described. However, four individuals of interest who were buried in single graves in close proximity to one another in the area he indicated were exhumed and subjected to forensic evaluation. Included among these individuals was one possible gunshot victim in Burial 101. Together with these four individuals, a total of fifty graves were documented in Block E (Figure 4.1).

This closing chapter presents a cumulative assessment of the burials of interest documented since 2021 for this investigation and our team's recommendations for next steps.

Summary Observations of Burials of Interest

The combined 2021-2023 phases of field work recorded at least 126 graves (124 numbered graves plus those that are associated with the headstones for Reuben Everett and Eddie Lockard) in Section 20 of Oaklawn Cemetery (Figures 4.1 and 6.1). Fully 120 graves had no associated markers visible on the ground surface in these excavation blocks. Two of these individuals—Burials 27 and 42—fit all three of the criteria for likely victims we expect to find in the Original 18 Area. The individual in Burial 101 is a possible gunshot victim. An additional 16 burials are considered of interest because they meet two of the criteria: males buried in an unadorned wooden container (Figures 4.2, 6.1, and 6.2).

Several traits may be observed among these 19 burials of interest.

- Two individuals were victims of gunshot wounds: Burials 27 and 42 (further details below)
- An additional possible trauma victim—Burial 101—has radiopaque particles in the soil near his right arm and mandible that *could* be derived from a gunshot wound.
- All 19 individuals of interest are males.
- No burials in Block C fit our criteria for exhumation.
- Eighteen of the individuals are buried in unadorned wooden caskets—likely locally produced. One exception is the repurposed shipping crate used to contain the individual in Burial 42.

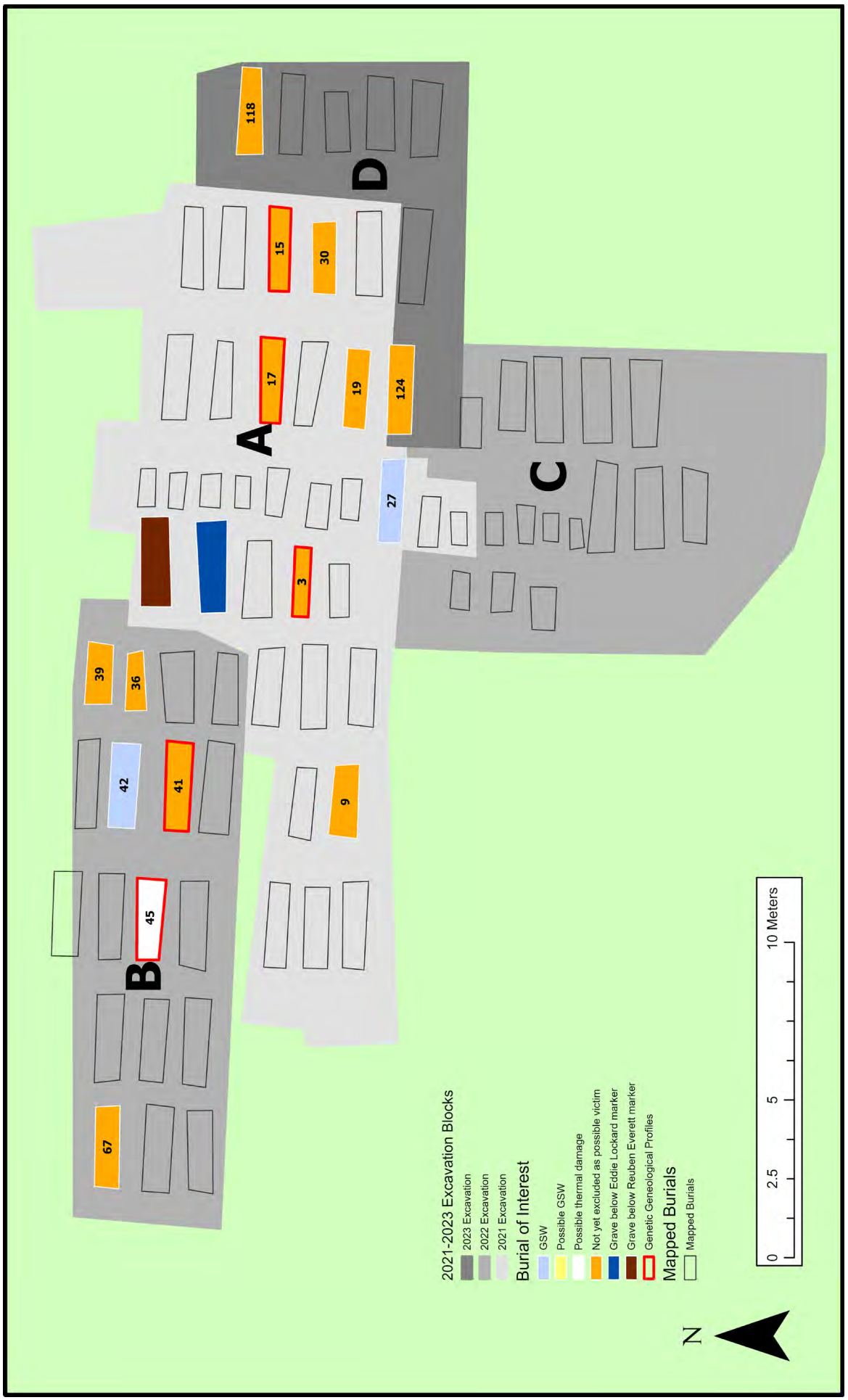


***Figure 6.1**. Distribution of burials of interest in Excavation Blocks A-D, including five individuals for whom genetic genealogical profiles have been developed (Burials 3, 15, 17, 41, and 45).*

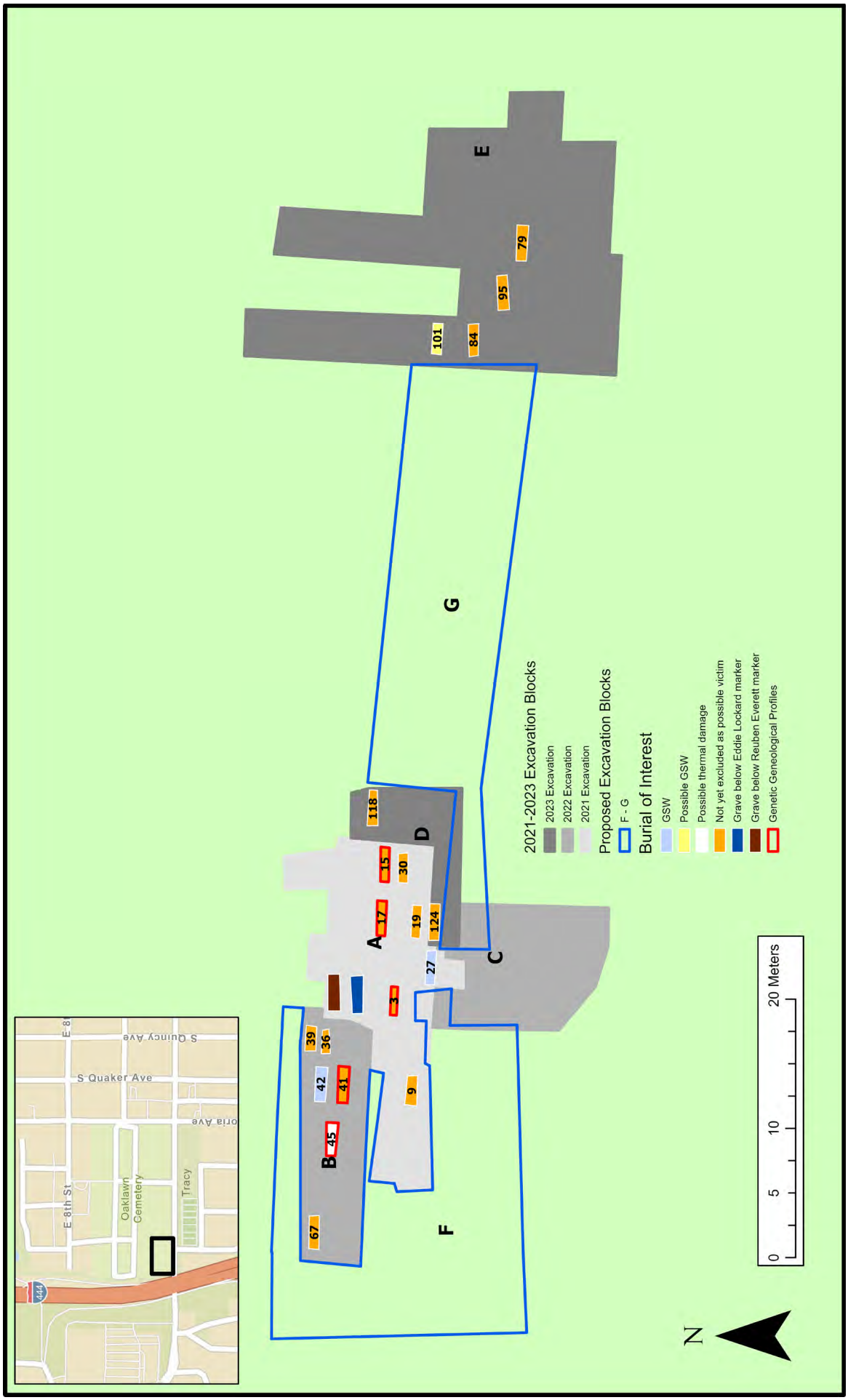


***Figure 6.2**. Distribution of burials of interest in Excavation Blocks A-E from the 2021-2023 field seasons and Excavation Blocks F and G proposed for the 2024 field season.*

- Most of these caskets appear to have been built to suit the size of the decedent, with the exception of Burials 3, 17, 19, 45, and 95 (and perhaps Burials 84 and 124) whose caskets were too small—or nearly so—for the individuals they contained.
- Two examples of expediency are demonstrated by the containers for Burials 65 and 95. These caskets were manufactured from uncured "green" pine wood that had not properly dried, suggesting hasty, local construction with substandard materials. Burial 95 is among the 19 individuals of interest. Burial 65 contained an adult female and is discussed further below.
- Among the burials of interest, all but Burial 15 is buried with his head to the west. Burial 15 is oriented with his head to the east.
- All are interred in the relict stream channel that was filled in along the cemetery's south side—presumably as part of the cemetery expansion prior to 1917.
- At least eight of the burials (Burials 17, 19, 27, 41, 42, 67, 79, and 84) display evidence of remains shifting after interment—likely due to water infiltrating the casket at a stage of decomposition when soft tissue was likely still present.
- Five of these individuals have genetic genealogical profiles for which potential surnames and areas of interest have been previously announced by the Inter-Mountain Forensic (IMF) team, including Burials 3, 15, 17, 41, and 45 (see Figure 6.1). DNA analysis is on-going for the remaining individuals and additional profiles may yet be forthcoming.

Burials of Particular Interest

Among the 19 burials of interest, three are particularly noteworthy: Burials 27, 42, and 124. The characteristics of each that make them distinctive compared to others in this burial population are discussed here.

Burial 27

The individual in Burial 27 was a younger adult male and the victim of multiple gunshot wounds to his left shoulder, left scapula, and head. He was shot with .38-caliber lead bullets that were probably fired from a revolver—likely a Colt, but a Hopkins and Allen or a Forehand and Wadsworth firearm cannot be definitively ruled out (Scott np).

He was buried in a simple wooden casket in a row of mostly infants/subadults and at a depth that is similar to the adjacent infant (Burial 26) and adjacent adult male (Burial 124) but notably deeper compared to all other burials in Blocks A and C.

Burial 42

Burial 42 is that of a young adult male, perhaps in his 30's, who suffered a gunshot wound to the head. The combined weight of the recovered bullet fragments is consistent with the two bullets from Burial 27 (Scott np).

He was clothed—likely in a pair of overalls—and in the bloat phase of decomposition at the time he was buried. This suggests that he had been deceased for some time prior to the recovery and burial of his remains. He was interred in a crate—perhaps to accommodate his bloated dimensions.

He appears to have had only his left foot intact at the time of burial as no evidence of his right foot was observed or recovered during the archaeological excavation or the forensic analysis. His left foot was inside a leather boot or shoe that was well preserved (Appendix A, this volume: Figure 21).

He had personal items in his pockets at the time of his burial (Appendix A, this volume: Figures 19-20 and 22-24) including several keys (Appendix E, this volume), a possible money clip, a possible pocketknife, and a possible lighter. The keys are of a type and function likely associated with a business location. "The primary keys likely operated both the main entrance of a commercial building and outswing steel security doors for after

business closing. The secondary keys likely operated an associated cash box and a cabinet or drawer within the business" (Pace, Appendix E, this volume).

These characteristics suggest that this individual was buried hastily and with minimal effort to handle the remains and employ standard burial preparations.

Burial 124

Burial 124 includes two individuals: an older adult male (124A) and a fetus of approximately 28 weeks (124B). Both individuals were buried in the same casket—as opposed to one being intrusively interred into the other. The fetal remains were recovered between the lower legs of the adult decedent.

The adult's stature was about 5'7". The excavators noted that the casket size appeared small and the fit for the adult decedent was "snug."

The casket for Burial 124 was placed at a similar depth as Burials 27 and 26, which is below the level of other interments documented in Blocks A and C. One—and perhaps two—additional graves were partially exposed near Burial 124 in Block D at a similar elevation and warrant further investigation.

Additional Noteworthy Burials

During the 2021 excavations, grave shafts were documented below the headstones for Reuben Everett and Eddie Lockard (Figure 6.1). These graves were not excavated so we have no specific knowledge of their contents or the individuals buried therein. Nonetheless, possible association with headstones of two known Massacre victims continues to make these graves of interest.

Burial 65 is that of an adult female postcranial blunt force trauma victim who was buried in a simple wooden casket. The proposed expansion of excavations includes an area (Block F) adjacent to Burial 65 and should reveal if other similar burials are nearby. Samples from her remains are included in the DNA analysis.

Burial 119 is that of an adult female who was buried with her head oriented to the east in a simple wooden casket. Within the burial population, only two other individuals were buried with their heads oriented to the east: Burials 15 and 110. Burial 15 is immediately adjacent and west of Burial 119. The similarities between these two burials and their proximity to one another are suggestive of some degree of relatedness or perhaps coterminous interment. Samples from Burial 119 are included in the DNA analysis. As noted above, Burial 15 is among the individuals whose genetic profile has yielded potential surnames and places of interest.

Proposed Next Steps

The results of the 2022-2023 phases of the investigation demonstrate the continued efficacy of the archaeological and forensic methods employed in the search for victims of the Massacre, but also demonstrate the need for additional field work. We have not yet recovered the number of gunshot victims and burn victims that are expected to be buried in Oaklawn based on limited death records. Taking the various lines of evidence described throughout this report into consideration, we propose to expand excavations at Oaklawn Cemetery in two blocks. Block F will target areas in the vicinity of burials of interest in Blocks A and B (Figure 6.2). Excavations in Block G will focus on covering the gap between Blocks D and E and will complete documentation of at least two graves in Block D that were only partially exposed in the 2023 field work (Figure 6.2). The process of excavation, *in situ* documentation, exhumation, on-site forensic analysis, and extraction of samples for DNA and genetic genealogical analyses will be consistent with previous phases of the investigation.

This proposed work will coordinate with the recommendations of the memorialization committee led by Ms. Brenda Nails-Alford, to conduct reburials of exhumed individuals and marking of exposed burials. This effort should include replacement of existing markers removed for protection during the excavations, as well as enactment of the memorialization committee recommendations.

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