

Introduction

In 2013 a Cultural Resource Management firm excavated an unmarked cemetery in Southampton, VA (Figure 1). Excavation was prompted by a grant issued for the removal of the cemetery in response to county development. Six, domed, brick vaults containing four cast iron coffins and two sets of skeletal remains associated with remnants of wooden coffins were uncovered. (Figure 2) Cranial bones and teeth from a possible seventh individual were recovered from a nearby secondary deposit. Southampton County deeds indicate occupation of the land since the 1700s¹. This study is an analysis of the burial containers and skeletal remains to determine individual identities of the deceased and evaluate body preservation in 19th century cast iron coffins.

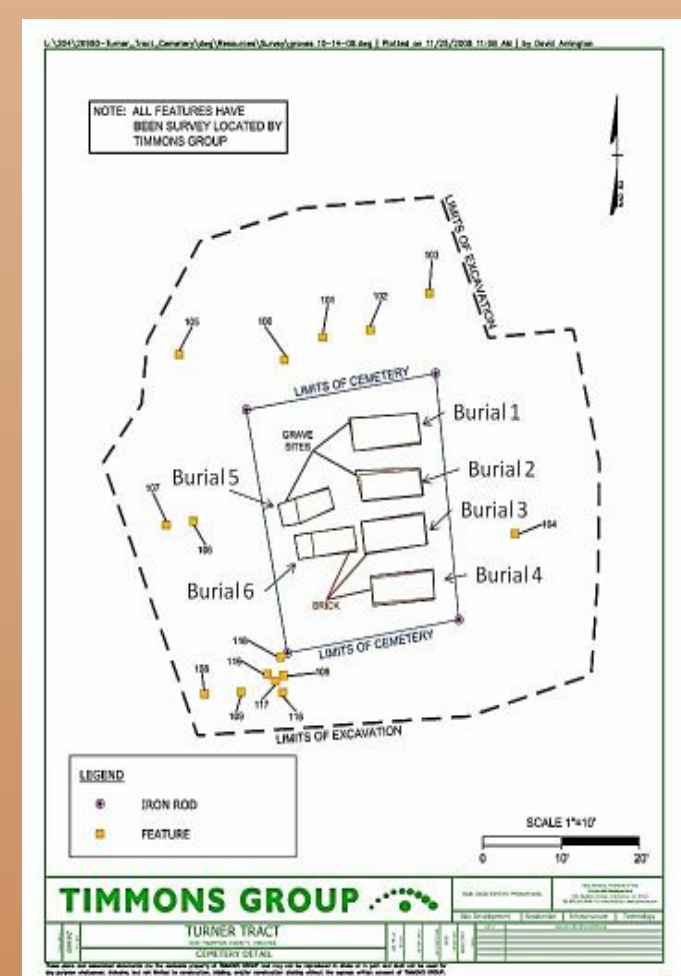


Figure 2: Burials enclosed in brick vaults. Muir-Frost and Tyler, "PHASE III ARCHAEOLOGICAL EXCAVATIONS AT THE TURNER TRACT CEMETERY SITE 44SN0286."

Figure 1: Burial site map from archaeology report. Muir-Frost and Tyler, "PHASE III ARCHAEOLOGICAL EXCAVATIONS AT THE TURNER TRACT CEMETERY SITE 44SN0286."

Archaeological Findings and Methodology

The four unopened metal coffins and additional skeletons were transported to the National Museum of Natural History (NMNH) for bioarchaeological analysis. The iron coffins are well-preserved, but two had been partially exhumed and vandalized decades ago by children². Their glass viewing plates were broken and remains may have been removed. Upon discovery of this occurrence by adults, the disturbed coffins were reburied, eventually becoming partially filled with dirt. The two wooden coffins had deteriorated and were represented by nails and small remnants of wood. The iron coffins were measured and stylistic elements were recorded. Computed tomography (CT) scanning was conducted prior to opening the sealed iron coffins to determine body and skeletal preservation and to check for possible infiltration by water. Biological profile data were obtained through osteological and CT analysis including assessments of dental pathology and dental development for determining the age of juveniles. The lids of each coffin were removed and contents were excavated from sediment and debris that had collected in the disturbed burial containers. Following methods presented in *A Standard for Data Collection from Human Skeletal Remains*³, age, sex, and ancestry for each set of remains were documented. As the remains were unidentified, these biological profiles were compared to historical records including reviews of land ownership titles, census data, and genealogical records to identify individuals that match the skeletal data and interment date based on the style of each coffin.

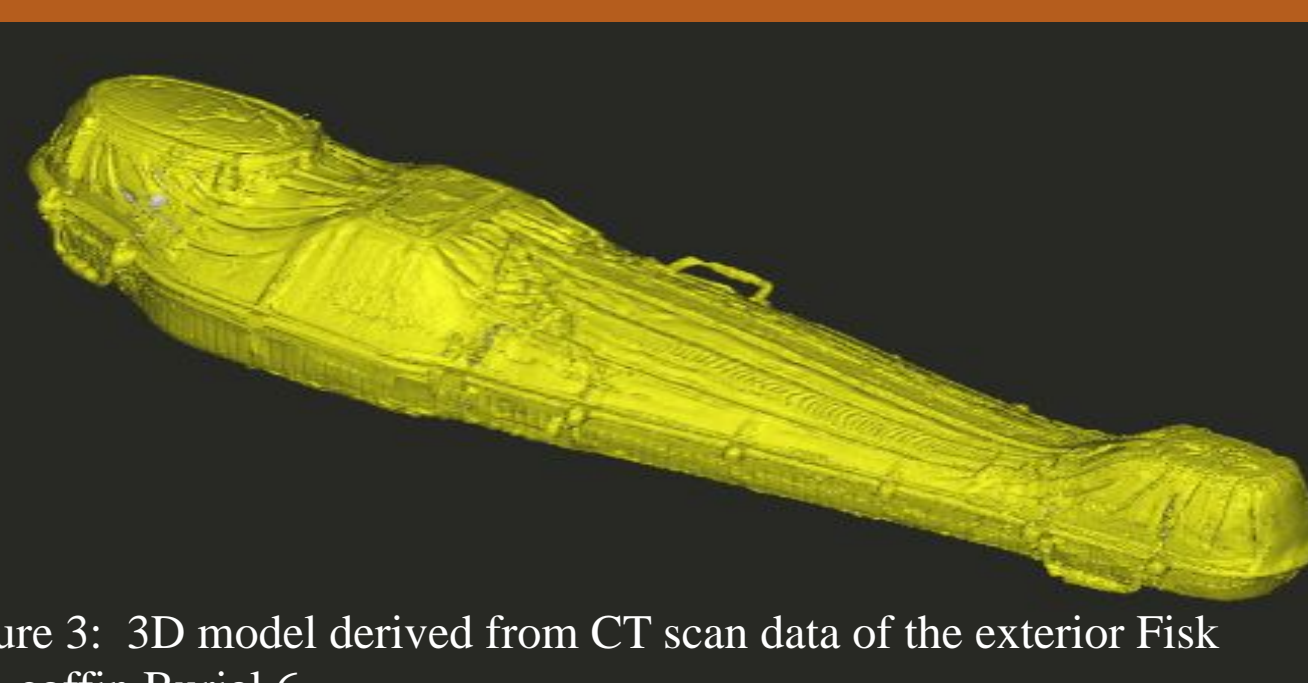


Figure 3: 3D model derived from CT scan data of the exterior Fisk iron coffin Burial 6

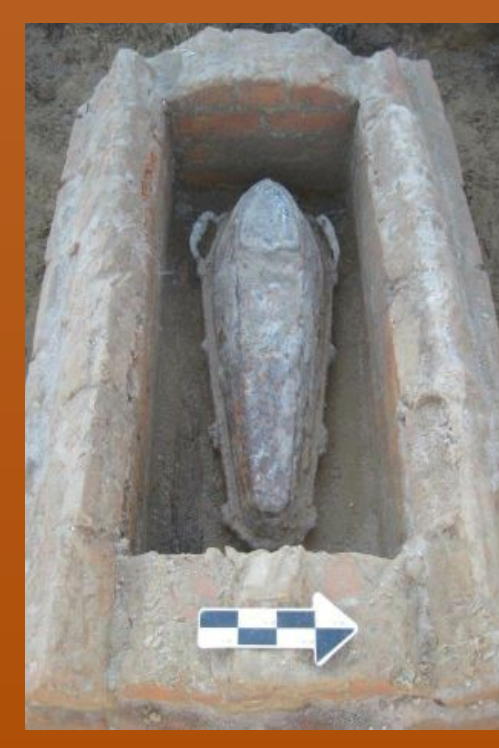


Figure 5: Plain case style iron coffin from Burial 5

Photo credit: Muir-Frost and Tyler, "PHASE III ARCHAEOLOGICAL EXCAVATIONS AT THE TURNER TRACT CEMETERY SITE 44SN0286."



Figure 6: Removing the bones from the Burial 6 coffin

Photo credit: James Di Loreto, Smithsonian Institution

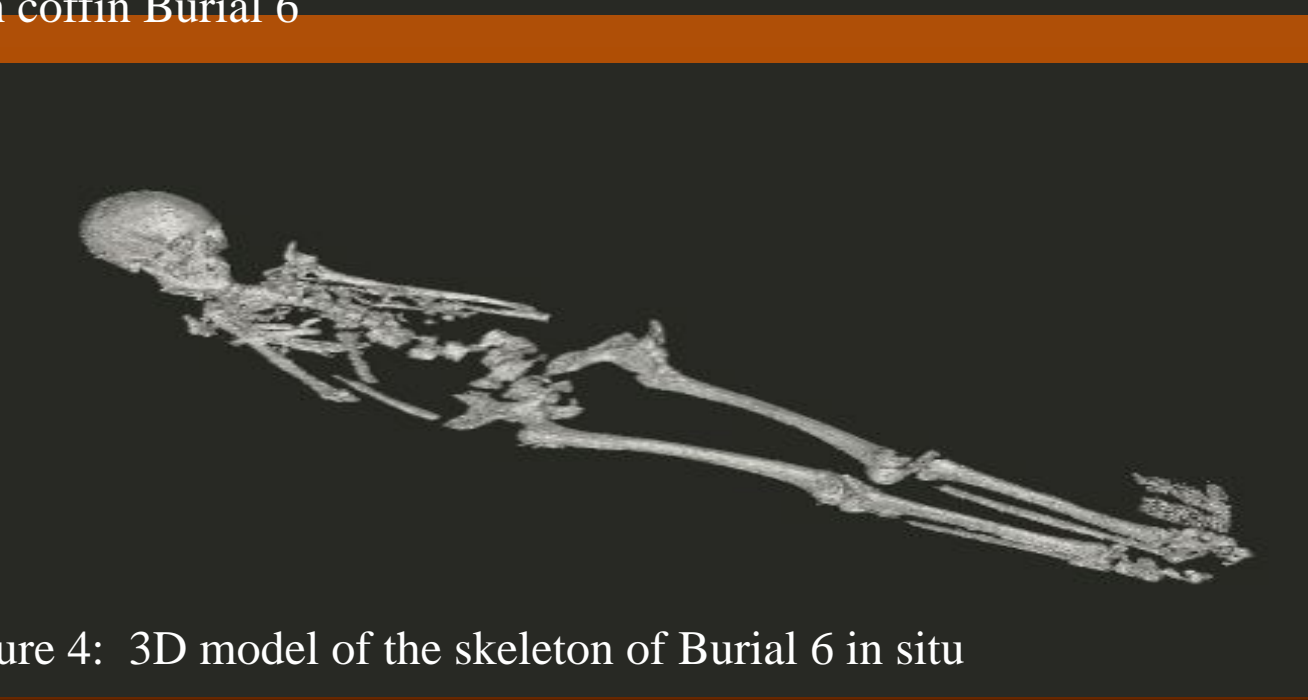


Figure 4: 3D model of the skeleton of Burial 6 in situ

Comparison of Skeletal and Historic Data

Five adult females, aged 16 to 39 years, one infant aged 6-9 months, and one fetus, aged 35 weeks, comprise the skeletal series (Table 1). All of the adults exhibit European ancestry. Three females, the oldest pregnant, were buried in Fisk-style cast iron coffins dating circa 1850 to 1853⁴. The infant was buried in a Plain case style coffin dating to the 1860s. Research using historical documents identified five deceased family members of the property owner during this time period (Table 2). Three wives and two daughters of the plantation owner died between 1830 and 1855. The wooden coffins represent successive wives who died in the 1830s before the invention of metal coffins. His third wife died in 1854 and two daughters died in 1855. Given their ages and closely spaced dates of death, the three coffins are identical in style. Cause of death for the 37 year-old was not recorded or evident in the skeletal remains, but may have been linked to pregnancy. Historical records indicate the property was sold and the family moved from Virginia in the 1860s. The late style infant coffin was the final burial in the family cemetery, and likely represents a child of the owner's fourth wife.

Table 1: Turner Tract Cemetery (44SN0286) Skeletal Data

Burial No.	Sex	Age	Ancestry	Pathology	Taphonomy	Coffin	Estimated Burial Date Based on Coffin and Vault Construction
01	Female	19-22	European/White	Impacted right M3; Cranial bones fragmented postmortem	Left temporal bone has rodent gnawing on the zygomatic arch and mastoid process. Postcranial skeleton mostly complete but all bones are broken or eroded; Green oxide staining bone discoloration	Hexagonal shaped / wooden, dome shaped brick vault	1830s
02	Female	30-34	European/White	Dental abscessing and caries present on left and right sides of maxillae; Asymmetry of the clavicle indicate healed fracture on right side done during childhood	Green oxide staining bone discoloration	Hexagonal shaped / wooden, dome shaped brick vault	1830s
03	Female	18-20	European/White	Skull is highly fragmented; Dental pathology includes both anteromortem and postmortem loss Carious lesions present in several teeth	Unweathered skull. Black mottled staining present on left parietal and left mandibular dentition. Lower limbs have exfoliation of outer cortex due to acidic conditions from inside the coffin. Orange bone discoloration	Fisk style iron, dome shaped brick vault	1850s
04	Female	30-39	European/White	Advanced dental pathology including carious lesions and abscesses	Demineralization of bones due to the infiltration of the water into iron coffin; Orange bone discoloration	Fisk style iron, dome shaped brick vault	1850s
04A	N/A	Late term fetus: 35 weeks	European/White	Damage sustained by movement from within iron coffin and water infiltration	Fragile due to exposure to water and iron in coffin; Orange bone discoloration	Fetus within B4A	1850s
05	Female	Infant: 6-9 months	European/White	Cranial bones more preserved than postcranial remains	Adipocere present on remains; Black staining bone coloration on cranium	Plain-case style iron, dome shaped brick vault	1860s
06	Female	16.5-17.5	European/White	Bones are fragile from the acidic environment within the iron coffin and multiple ribs are fragmented in 2 or more pieces	The superior portion of the skull including the frontal and superior portion of the parietals are lighter in color ranging from white to tan and suggests the water line that once filled the coffin. Erosion among the long bone epiphyses; Red to dark brown bone discoloration	Fisk style iron, dome shaped brick vault	1850s

Table 2: Turner Tract Historical Information

Deceased Individual 1830-1860	Sex	Ancestry	Age at death	Date of Death	Cause of Death	Possible Identity	Historic Records
Plantation Family Member 01	Female	European/White	22	Jul 4, 1830	Not Reported	Plantation Owner's Wife 1	Marriage License Virginia, 1740-1850 Ancestry.com
Plantation Family Member 02	Female	European/White	Not recorded	Sep 17, 1835	Died 16 days after giving birth to her third child	Plantation Owner's Wife 2	Ancestry Family Tree, WikiTree, Ancestry.com
Plantation Family Member 03	Female	European/White	19	Feb 22, 1855	Not Reported	Plantation Owner's Daughter	1850 United States Federal Census, Ancestry.com
Plantation Family Member 04	Female	European/White	37	Apr 16, 1854	Not Reported	Plantation Owner's Wife 3	1850 United States Federal Census, Family Bible, Ancestry.com
Plantation Family Member 4A	N/A	European/White	Not recorded	Not recorded	Not Reported	Plantation Owner's Baby	Wiki Family Tree Family Bible, Ancestry.com
Plantation Family Member 05	Female	European/White	Not recorded	Not recorded (DOB abt 1860)	Not Reported	Plantation Owner's Daughter	Ancestry Tree from Family Bible, Ancestry.com
Plantation Family Member 06	Female	European/White	17	abt 1838 Mar 1855	Typhoid Fever	Plantation Owner's Daughter	1850 United States Federal Census, Virginia and New York Genealogy Obituary Newspaper Article, Ancestry.com

Taphonomy Results

This study explored taphonomic processes that occur within iron coffins. Iron coffin studies have documented a range of taphonomic features from exceptional preservation of body tissues and clothing⁵ to near-complete bone deterioration⁶. Analysis of the iron coffin burials from the Turner Tract archaeological site indicated fair skeletal preservation with clothing preserved in only one burial (Figure 13). Bone chemistry implicates a process known as iron sulfurization that results from the acidity created by acid sulfates within the iron coffin. Iron sulfurization was encouraged by the combination of natural decomposition by products in addition to lead sulphates from the type of paint used to finish the interior of the coffin. Exfoliation, demineralization, and a color range of dark orange to black staining of outer bone cortices was evident for all skeletal remains in iron coffins from this cemetery.



Figure 7: Burial 6 Fisk iron coffin

Photo credit: James Di Loreto, Smithsonian Institution

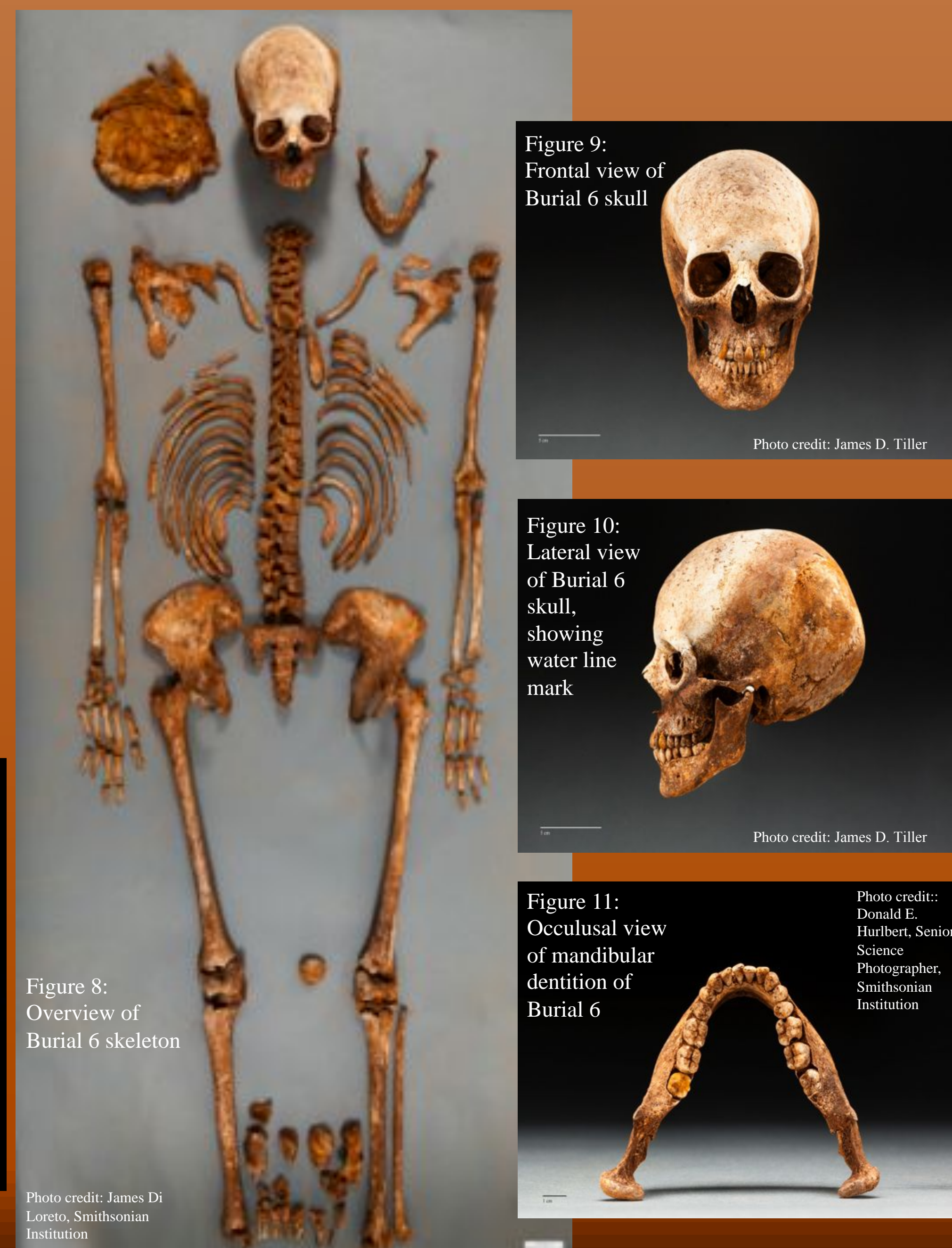


Figure 8: Overview of Burial 6 skeleton

Photo credit: James Di Loreto, Smithsonian Institution

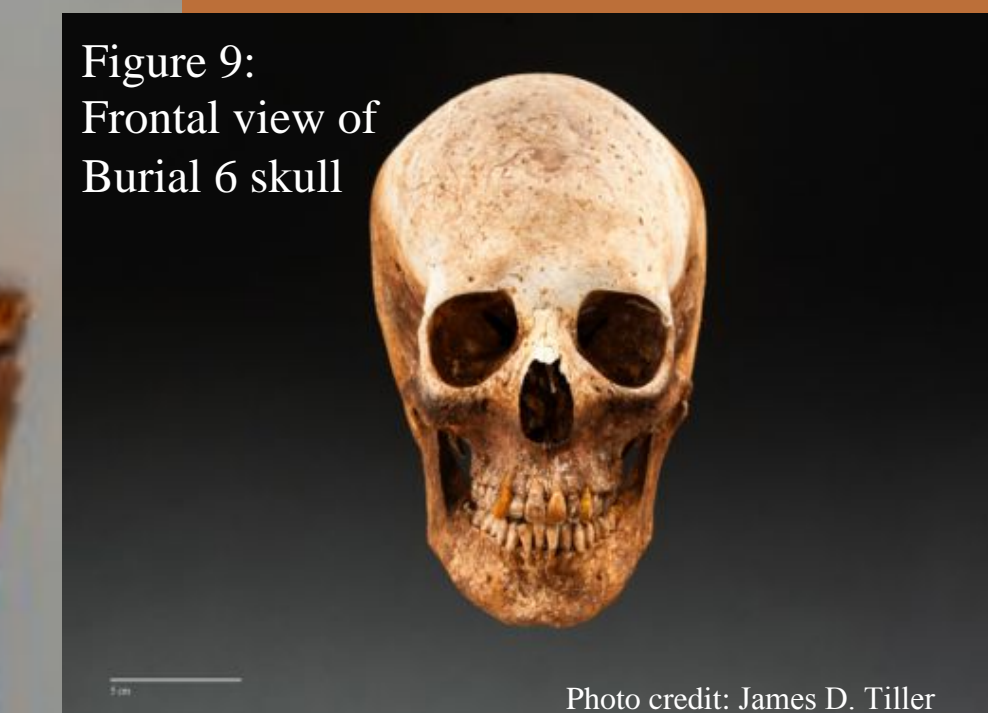


Figure 9: Frontal view of Burial 6 skull

Photo credit: James D. Tiller

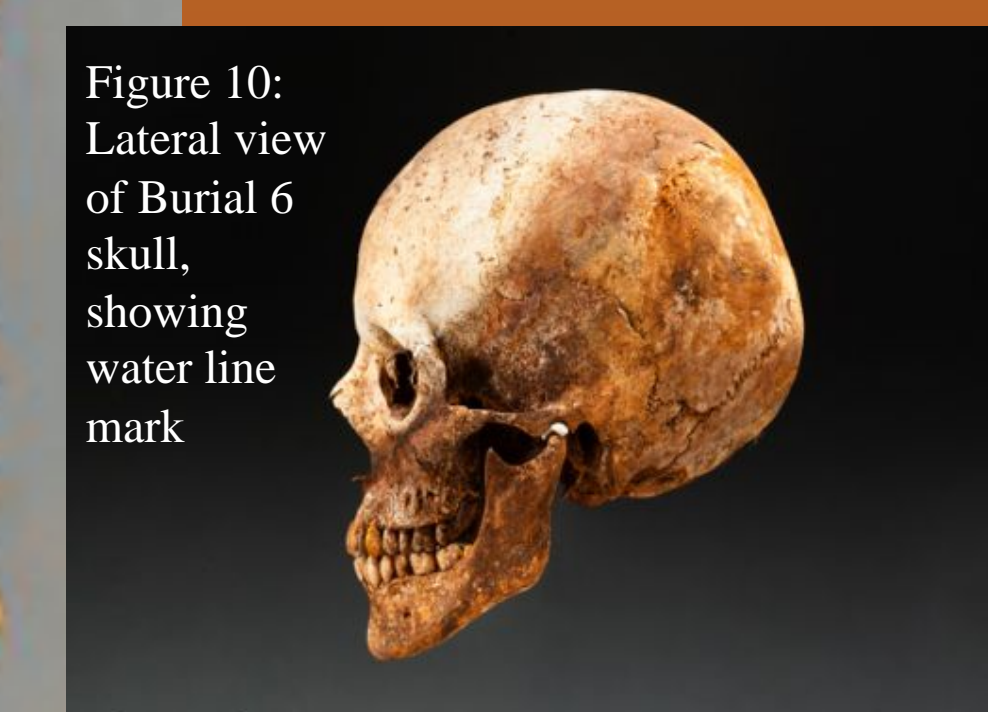


Figure 10: Lateral view of Burial 6 skull, showing water line mark

Photo credit: James D. Tiller

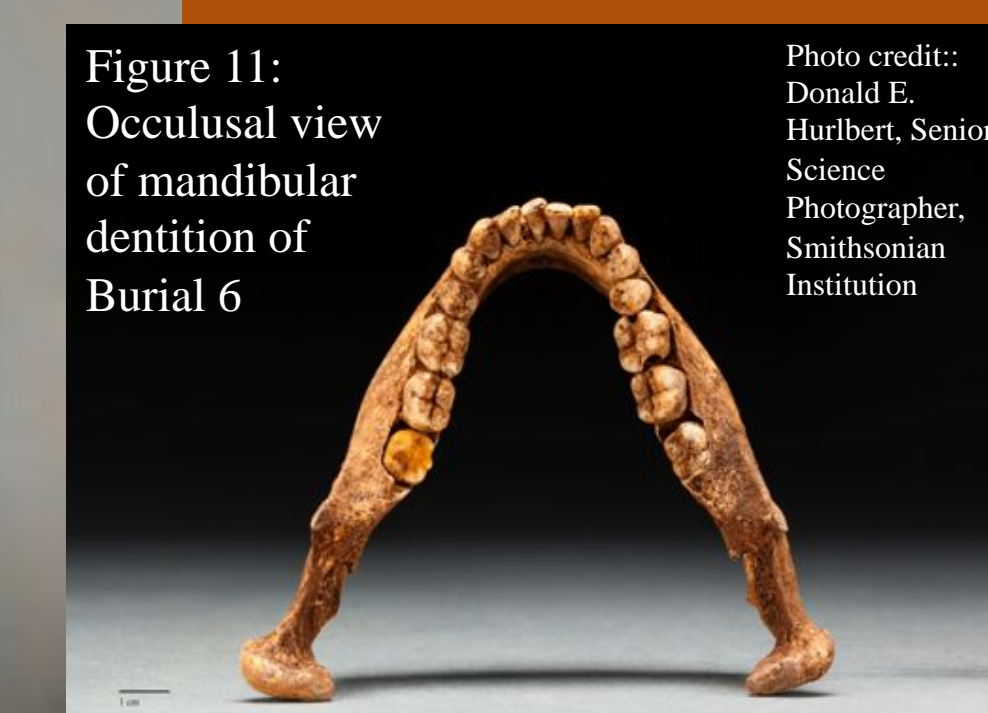


Figure 11: Occlusal view of mandibular dentition of Burial 6

Photo credit: Donald E. Hurlbert, Senior Science Photographer, Smithsonian Institution

Clothing Preservation

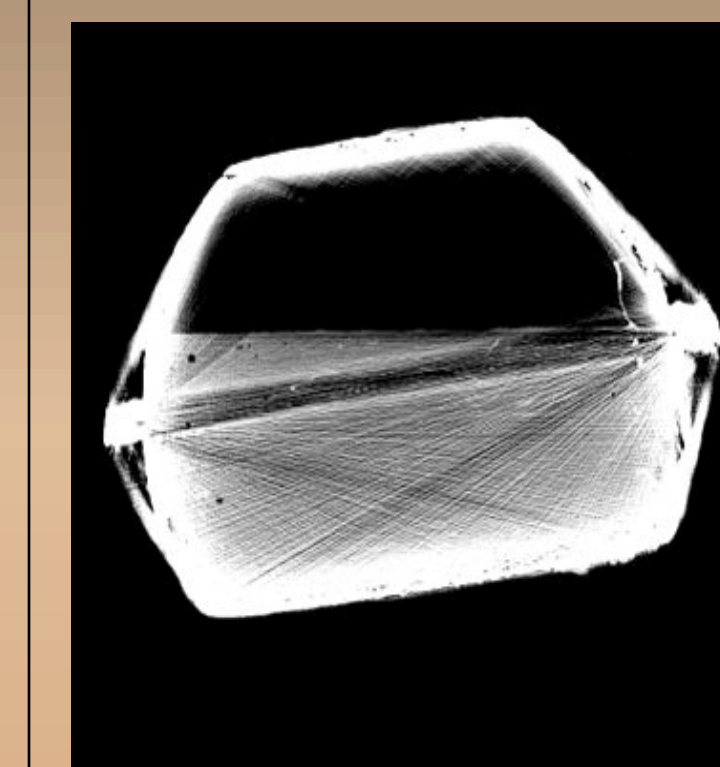


Figure 12: CT scan showing water infiltration and aliasing of Burial 5

Water infiltration in an iron coffin can demineralize bone and hasten deterioration. Clothing preservation is possible but varies based on the types of fibers of the garments⁷. Preliminary CT analysis revealed water infiltration in the Burial 5 coffin (Figure 12). When opened, stockings, booties, an undershirt, diaper, pillow and petticoat survived, but bone preservation varied. The skull and some elements of the upper body survived, but more fragile elements and most bones of the lower body had completely deteriorated.



Figure 13: Burial 5 clothing showing excellent preservation a. dress, b. booties, c. undershirt, d. stockings

Photo credit: James D. Tiller

Discussion

The types of coffins found at the Turner Tract site are expensive styles used in the 1850s and 1860s by the wealthy. Sealed iron coffins create a protective environment that can facilitate preservation for the deceased for centuries. Preservation of clothing and hair was observed, but the skeletal remains exhibit signs of demineralization from an acidic pH inside the coffins.

Conclusion

Analysis of the Turner Tract rural family cemetery required an interdisciplinary approach to determine identities of the deceased wide consideration of research questions relating to overall preservation, use of genealogical and historical resources and taphonomy of iron coffins. CT technology allowed an advanced insight into states of body preservation. Historic records indicate possible identities for formerly unmarked burials at this site. Directions for future taphonomic analyses of iron coffins and identification of burials were established through this research.

Acknowledgments and References

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