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Opening the Vault: An Osteobiography of Three Individuals from a New Orleans Cemetery

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Opening the Vault: An Osteobiography of Three Individuals from a New Orleans Cemetery

by

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ABSTRACT

The purpose of this study is to reconstruct the lives of three individuals buried in Cypress Grove Cemetery in New Orleans through osteobiographies, which combines knowledge gained from human remains, material culture, and mortuary practices. The opportunity for analysis arose since the vault was being demolished due to its dilapidated condition.

The individuals were White and of middle-class status and date to the later nineteenth century. One burial is a middle-aged man who was of average height and showed no evidence of pathology; his muscle markers do suggest he was relatively Physically active during his life. Another individual is an adolescent girl who was buried in an iron coffin and likely died from one of the many infectious diseases the city. She was small for her age and experienced multiple health disruptions earlier in her life. The last individual was highly fragmented but appears to be a middle-aged female of average height. Both Burials 1 and 2 displayed extensive caries resulting from the sweet carbohydrate-rich diet preferred by New Orleanians of the time. The material culture that was recovered from the grave vault included coffin hardware, such as swing-bail handles, thumbscrews, and highly decorative escutcheons. Apparel-related items were also recovered, including shell buttons, cloth, and a ribbon located in the hair of the teenage girl. Associated material culture as well as osteological indicators suggest that these individuals led a life typical of White middle-class citizens of New Orleans as now their stories can be told.

Keywords: Osteobiography, New Orleans, Cypress Grove, nineteenth century, disease, bioarchaeology.

DEDICATION

To every fellow scholar who dreams of being the next Dr. Temperance “Bones” Brennan or has a passion for forensic anthropology - dreams truly do come true.

“From my rotting body, flowers shall grow, and I am in them and that is eternity.”

- Edvard Munch

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LIST OF ABBREVIATIONS

L	Left
LEH	Linear Enamel Hypoplasia
R	Right
SEM	Scanning Electron Microscopy
USM	The University of Southern Mississippi

CHAPTER I: INTRODUCTION

New Orleans. For many people, just the mention of the city in south Louisiana is enough to spark several connotations. The excitement of Bourbon Street, Mardi Gras parades spanning blocks upon blocks, jazz, and the exquisite and authentic Cajun cuisine are among the many cultural phenomena the city has come to embody. Regardless of what comes to mind, all of these qualities have one thing in common: they are a vital aspect of the rich history of New Orleans. It is arguably one of the most interesting cities in the country (and I would even suggest the entire world). The city, however, is very much a product of its unique past.

Prior to the Civil War, New Orleans saw tremendous population growth and urbanization which would forever change the city in terms of its usefulness, popularity, and perception. After the Civil War, a Reconstruction-era government took place, but this unfortunately did not ease racial tensions prevalent in the city; in addition, tensions were already high between the Creole, Black, and White populations, and the situation was only accelerated by the arrival of boatloads of European immigrants (Campanella 2007). Health challenges also abounded as a severe yellow fever epidemic struck the city in 1878, causing a large depletion in population (Curtis et al. 2007, Duffy 1971, Nelson 2002, Patterson 1992). The beautification of death movement that was also sweeping the nation in the nineteenth century seemed to coincide with the cloud of death and disease that hovered over New Orleans, eventually altering how the city would inter their deceased (Bell 1990, Little et al. 1992, McDowell and Deetz 1989, Upton 1997).

Another component of New Orleans that binds the city together is its unique and often romanticized cemeteries. New Orleans is home to over 150 mesmerizing

cemeteries, each with its own incredible history (New Orleans n.d. b). Many (if not all) of these cemeteries rely on the mortuary practice of burying the dead above ground, typically in a grave vault or a mausoleum, since New Orleans is below sea level. Cypress Grove, a cemetery located directly on City Park Avenue in the heart of New Orleans, is one of these cemeteries with a rich history both outside and inside its gates.

Cypress Grove was initially developed as a cemetery dedicated to volunteer firemen in 1840 (Black, 2022). Like many other cemeteries in New Orleans, this one utilizes the centuries-old mortuary practice of aboveground gravesites or mausoleums. Two sides of the cemetery are bounded by a wall over a century old containing hundreds of individual burial vaults. This wall was severely dilapidated, and because of this, many individuals' final resting places began to crumble. The cemetery arranged for demolition of the wall, and I was given the opportunity to analyze the remains within one of these vaults, which contained three individuals who date to the latter 1800s. These individuals' remains not only give us a glimpse into what life was like during this time period but also grant an individualistic perspective into what life was like for them through the production of an osteobiography; this bioarchaeological method can give a voice back to the dead.

An osteobiography employs the interpretation of human remains alongside artifacts included in a burial to convey what life was like for a certain individual (Pfeiffer 2022). Certain skeletal markers can give insight into an individual's age, sex, stature, and ancestry. Other markers may indicate injury, such as antemortem or perimortem fractures, or they may indicate how active an individual was in life via muscle attachment markers. Further osteological indicators can also provide insight into whether an

individual experienced any illnesses or diseases. The mortuary practices associated with the individual, such as grave goods, also inform us of what was important to these individuals in life and in death; in short, they shed light onto what the culture was like at a given time frame. By combining all of these elements into an osteobiography, an important and personal conversation can be had with these people about what their individual lives were like - a conversation that is truly unique and cannot be had with anyone else.

In this study, I will be completing an osteobiography for each of the three individuals contained within my vault. Through the distinctive and personal conversations with a middle-aged man, another adult, and an adolescent child, I hope to shed light on what their lives were like in New Orleans around the 1890s.

CHAPTER II: LITERATURE REVIEW

Nineteenth-century New Orleans was a time of rapid change in economic and social development. Industrialization and immigration fueled the advancement of the city, but the two also coincided with overwhelming disease prevalence and escalated ethnic tensions in the Crescent City (Campanella 2007, Condran and Lentzer 2004, Curtis et al. 2007, Nelson 2002, Offutt 2010, Oneal 1964, Patterson 1992, Troesken 2001).This in turn led to an increase in unsanitary conditions which further impacted the kinds of diseases present in the city throughout the 1800s, with yellow fever, diarrheal diseases, and tuberculosis taking the lives of many of New Orleans' poorest and most susceptible inhabitants. Mass death, as a result of epidemics, coincided with the beautification of death, a movement that swept the nation in the nineteenth century; the beautification of death movement focused on making death more beautiful and romanticized in contrast to death's sorrowful occasion. Consequently, New Orleans altered the way they interred their dead (Bell 1990, Little et al. 1994, Owsley et al. 2006, Upton 1997). Throughout this review, I hope to connect the ways in which industrialization, immigration, and the insurgence of disease shaped the city of New Orleans and gave it some of its most notable and remarkable qualities.

Immigration and Ethnic Differences in New Orleans

New Orleans has always been known as a melting pot, a vast intermixing of people from all ethnicities, races, religions, backgrounds, and lifestyles. Ethnic intermixing began to grow in the city in the nineteenth century as a result of mass immigration. Prior to the first big wave of newcomers, early New Orleans was comprised largely of French-speaking Catholics, more commonly known as Creoles, as well as

Anglo-Americans and some foreign-born inhabitants (Campanella 2007). In 1809, however, New Orleans saw an influx of immigrants by the thousands. White refugees, free people of color, and slaves entered the city following the Haitian Revolution, causing population to double (Campanella 2007). The 1820s introduced another wave of immigration which lasted until the 1850s. By 1840, population reached 102,193 (New Orleans n.d. a). Primarily Irish and German families pervaded the city looking for work, and these individuals settled in semi-rural portions of the city due to affordable housing availability (Campanella 2007, 707). Because of the city's connection to one of the largest ports in the world, these individuals found jobs in "flatboat wharves, warehouses, slaughterhouses, tanneries, and in public-works projects for canals, drainage, and railroads" (Campanella 2007, 707). Tensions that Creoles previously had with Anglos somewhat diminished but instead became redirected to new immigrants occupying the city and inserting themselves in the workforce.

Following the Civil War, New Orleans began to see an even higher spike in population. According to Campanella (2007), the Black population doubled from 25,423 in 1860 (14,484 enslaved) to 50,456 in 1870 (708). Racial tensions were still inflated in Reconstruction-era New Orleans, resulting in emancipated individuals and Black families primarily settling in the least desirable areas of town. Most of these individuals were employed working "dock jobs, and in blocks developed with vernacular housing set in walking distance of mansion-lined grand avenues," and many worked as domestic laborers (Campanella 2007, 708). Creoles of color were afforded a slightly more privileged life, although this "privilege" was nothing in comparison to what White people

enjoyed during this time period; despite the massive population growth, Creoles remained in their traditional neighborhoods in lower-city areas (Campanella 2007).

Along with ethnic and racial tensions, class tensions began to build as the 1800s progressed. While the poor and working-class continued to grow in the city as a result of thousands of individuals entering the city, the wealthy and elite occupied the state with as much (if not more) authority. Sugar plantations produced an incomprehensible amount of profit dependent upon the labor of enslaved individuals. In fact, "in the 1850s alone, Louisiana plantations produced an estimated 450 million pounds of sugar per year, worth more than $20 million annually" (New Orleans n.d. a). Enslaved people continued to harvest cotton and sugar, immigrants worked tirelessly as dockworkers loading bales of cotton and barrels of sugar onto steamboats, and plantation owners reveled in their privilege which afforded them wealth, resources, and stability. Unfortunately, the local economy and politics continued in this manner throughout the nineteenth century, which heavily affected the working- and middle-class populations. A rush of immigration, emancipation, and, thus, exorbitant population growth both beautifully and tragically coincided with another aspect that made the nineteenth century such a developmental timeframe for New Orleans: industrialization.

Industrialization: Booms in the Big Easy

Across the United States, industrialization was occurring at an expeditious rate in the 1800s. In a port city like New Orleans where economy, trade, and job opportunities were abundant, industrial development provided a gateway to massive social change. During this time, New Orleans began to shape into the city many of us recognize today. The introduction of streetcars made maneuvering around the city much easier for its

citizens. The erection of new buildings, many of which still stand in the city today, provided numerous jobs to inhabitants, making immigration to the Crescent City even more appealing. In addition, a mass departure of the rich from inner-city residences provided potential new homes for the city's ever-expanding population. All of this change coincided with the second wave of immigration that struck New Orleans. The "immigrant belt" became a hotspot for new settlers and "offered enough advantages (convenience, work, housing, and social networks) to make life easier for the impoverished newcomers but suffered enough nuisances (crowding, noise, and crime) to keep rents affordable" (Campanella 2007, 708). The US Census Bureau indicates that by 1880, the typical New Orleans family consisted of around 4.77 people, and almost 6 people resided in one dwelling (1883).

Railroad construction also boomed during this period of industrialization, making the transport of necessary goods and trade in and out of the city more accessible. Construction of railroads was welcomed, especially by middle-class citizens, due to the economic stagnation resulting from the lack of trade during the Civil War (Ettinger 1985, Wells 2009). Steamboats continued to be a vital connection to this trade network. With the combination of railroad construction and trade, transportation via steamboat, and infrastructural growth, inhabitants were afforded quite a few opportunities for unskilled labor jobs. In addition to unskilled jobs available, urban development advocated for more enterprise jobs available to middle-class citizens, such as "merchants, doctors, lawyers, small manufacturers, teachers, and other commercial and professional interests" (Wells 2009, 655). The establishment of more schools, banks, and libraries throughout the urban South worked nicely to aid the job opportunities open to residents of all classes (Wells

2009). Unskilled laborers found employment in constructing these buildings, and commercial employees were granted establishments to pursue more professional practices.

Indeed, this social change was welcome as it provided New Orleans with an intricate intermixing of culture while promoting seemingly sustainable growth. However, much of the change that was occurring within the city arguably occurred too rapidly. Certain demographics felt this sudden halt in social expansion much harder than others, especially the African American community and impoverished working-class individuals (Nelson 2002, Ettinger 1985, Troesken 2001). Neighborhoods became overcrowded, eventually leading to urban slums that would shape how some viewed New Orleans - as a filthy cesspool of blue-collar immigrants who lacked any understanding of hygiene and decency (Offutt 2010, Campanella 2007). To add to this viewpoint, New Orleans did not install an urban water system until just before the turn of the twentieth century. Local governments and structural reform could not keep up with the population growth the city was experiencing, eventually promoting diseases that would claim the lives of thousands of New Orleanians.

Unsanitary Conditions: Promotion of Disease in the Crescent City

As a growing population led to crowded and overwhelmed neighborhoods, slums began to take precedence over the beauty the city was once known for. Conditions grew more unsanitary as time passed, and unsanitary conditions were exacerbated by the fact that most residents had no way of properly bathing themselves (Offutt 2010). The elite had access to floating pools and even private bathhouses, but working-class citizens often had to resort to bathing in the Mississippi River; eventually, statutes were passed

prohibiting nude bathing in public water, leaving most residents to literally live in filth, sweat, and dirt from weeks of work.

However, as time progressed and disease became all the more prevalent within the city, a need for sanitary options to bathe became arguably overwhelming for poorer, working-class citizens. These floating pools and bathhouses began to pop up in the early 1800s and remained significant institutions all throughout the nineteenth century. Oddly enough, these floating pools were not funded by the local government, at least initially, but were created by entrepreneurs throughout the city. New Orleans could have been the first to implement these floating pools as a result of the strong cultural connection the Crescent City possessed with France, resulting in a spread of these institutions to places where immigration was skyrocketing and industrialization was booming (Offutt 2010, 10).

It was not until the mid-1800s that New Orleans began to take public health and sanitary conditions more seriously. Around this time, "personal cleanliness had developed a symbolic meaning for the middle and upper-class Americans," resulting in heavy pressure for affordable public baths (Offutt 2010, 13). In addition, yellow fever began to sweep the city, which led health experts to strongly advocate for these useful instruments to prevent disease. Following the cataclysmic epidemics of 1853 and 1854, New Orleans finally established its own health department (Offutt 2010, 19). More floating pools began to arise, and, by the late 1800s, swimming actually became a popular recreational activity among working-class New Orleanians. There were even contests and races held that awarded prize money, which "freed New Orleanians from

some of the demands of urban life and the discomfort of the semi-tropical climate" (Offutt 2010, 27).

During the Civil War, cotton bales and the steamboats they were loaded on were burned by Confederate General Lovell prior to his flight from the city; these fires subsequently took the adjunct floating pools with them (Offutt 2010, 28). The last two decades of the nineteenth century saw the final diminishment of bathhouses and floating pools. They lost popularity for a number of reasons. In 1877, a statute outlawed "bathing in any publicly exposed water within or contiguous to the city," which included floating pools (Offutt 2010, 29). Tugboat incidents and drowning accidents also impacted the use of floating pools. New Orleans still lacked appropriate funding for public health at this time, but running water began to be more common in homes with the progression of a mass water works system beginning towards the turn of the century.

Although a mass water works system was established, the quality of the water was anything but sanitary. The New Orleans Waterworks Company began its operation in 1878, a year when New Orleans dredged through a vicious epidemic of yellow fever (Troesken 2001, Curtis et al. 2007). The company was privately owned, so no government regulations had a foothold in its operation. It was not until 1905 that the waterworks system in New Orleans was found to be completely inadequate (Troesken 2001., 770). Prior to and even after this discovery, poor New Orleanians, especially the African American community, suffered the greatest disparities in terms of having access to sanitary water. In "Growing up in New Orleans: Memories of the 1890's," Oneal (1964) recalls that proper drinking water was unavailable to her and her family; as a result, the use of a cistern in her backyard unreliably provided drinking water and water

for household use. Hydrants "furnished water for lawns or flowers, but it was muddy; some said it was filthy with sewage from St. Louis and the other places all up the river, and full of all sorts of disease germs" (Oneal 1964, 85).

The deficient water supply system in New Orleans was not the only water-related issue the city had. Due to its geographic location, flooding occurred frequently in the city (Campanella 2007, Oneal 1964). It was not uncommon for storms to ravage the city, and because New Orleans sits below sea level, the lack of adequate drainage systems left entire neighborhoods soggy and muddied. The mixture of New Orleans's frequent floods along with geographic and topographic features created the perfect breeding ground for diseases and vectors of diseases like mosquitoes. New Orleans's involvement in the sugar trade further created the ideal environment for mosquitoes (Patterson 1992). These insects could feed upon the sugary water left behind from rainfall and subsequent flooding, creating the perfect storm for their transmission of deadly diseases - notably, yellow fever and diarrheal diseases.

Yellow Fever and Other Diseases Sweep New Orleans

Yellow fever is a viral disease transmitted through the bite of an infected mosquito. Symptoms of this illness include fever, body aches, chills, and nausea - at least in mild, clinical cases (Curtis et al. 2007, Nelson 2002, Patterson 1992). In more severe cases, however, this disease wreaks havoc on the infected. Yellow fever attacks the liver and gastrointestinal system, resulting in jaundice and gastric bleeding (Curtis et al. 2007, Nelson 2002, Patterson 1992). Yellowing of the skin results from liver damage, and "black vomit" occurs due to gastric bleeding, a sure sign that someone was infected with yellow fever; capillary damage can also cause an individual to bleed from orifices in their

face, and, eventually, neurological damage is seen in terminal cases (Patterson 1992). Delirium can ultimately lead to the individual being suspended in a coma-like state, and they eventually will be taken by the disease.

Yellow fever was rampant throughout many coastal cities in the United States during the 1800s, but it particularly lingered and stalked the residents of New Orleans who dubbed the disease the "saffron scourge" (Duffy 1971, 802). The city saw quite a few outbreaks throughout the century. The first recorded deaths by yellow fever in New Orleans occurred in 1811, and 1853-1854 and 1878 saw mass epidemics of the disease; the highest estimated deaths for 1853-1854 sit at over 11,000 and 4,046 in 1878 (Patterson 1992, 857-858). Yellow fever thrived throughout the summer months and into early autumn when mosquito activity was at its highest, and it dealt its hardest hits on foreign-born individuals.

Curtis et al. (2007) and Patterson (1992) argue that actual reporting and documentation of immigrants who had just entered the city and died from the virus were omitted from reports, resulting in skewed estimates and underreporting of deaths from yellow fever. In 1878, racial tensions were still elevated in the post-Reconstruction era. As a result, medical professionals were biased toward more middle-class white inhabitants of New Orleans. African American residents were not given as high of a priority when it came to reporting and even diagnosing cases of yellow fever (Curtis et al. 2007). The rich and elite also evacuated the city in swarms, and they would often take the disease with them (Curtis et al. 2007) The final numbers of cases and deaths are likely incredibly underestimated due to the socioeconomic disparities faced by certain demographics in New Orleans.

A wide range of speculation exists, however, as to who exactly was most vulnerable to the disease. While case records may be underreported for Black New Orleanians, evidence suggests that this community had greater immunity to contracting yellow fever (Patterson 1992, Kiple and Kiple 1977). Yellow fever originated in coastal regions of Africa and was transmitted to America during the slave trade. Due to much of New Orleans's Black population consisting of freedmen who were brought from Africa, South America and the Caribbean, these individuals had previously been exposed to the virus, granting them some acquired and genetic resistance (Kiple and Kiple 1977, Patterson 1992). While the Black community could definitely still contract the virus, they were much less likely to die from it as opposed to their White counterparts; Creoles in the city actually had lower-than-normal mortality rates compared to immigrant rates of mortality (Kiple and Kiple 1977, Nelson 2002, Patterson 1992). However, these reported mortality rates may be inaccurate due to the negligence afforded to this demographic. Literature also presents contrasting views of how children were impacted by the virus. Both Kiple and Kiple (1977) and Patterson (1992) note that children typically presented mild cases. However, Curtis et al. (2007) suggest that children were largely impacted by the disease. In fact, they assert that "58% of the final death total were children under the age of 16, most of whom were born in the city" (Curtis et al. 2007).

I cover yellow fever in-depth due to its overwhelming persistence in New Orleans during the nineteenth century; however, it is important to note that other diseases - such as tuberculosis, diphtheria, malaria, typhoid fever, scarlet fever, and others - held precedence as well, but extensive analysis of all these diseases is beyond the scope of this research (Condran and Lentzner 2004, Duffy 1971, Nelson 2002). However, I will briefly

discuss diarrheal diseases because they also resulted in a large number of deaths in New Orleans. Unsanitary conditions brought about by crowded neighborhoods yielded a number of diarrheal diseases like dysentery and cholera; infectious respiratory diseases like tuberculosis and diphtheria were more easily transmissible through crowded neighborhoods. Asiatic cholera grew to be "the most feared of all diseases in the 19th century" and was a direct result of rapid industrialization (Duffy 1971, 802). Diarrheal diseases especially impacted young children and infants, particularly during summer months for highly urbanized cities throughout the United States (Condran and Lentzner 2004). While summer peaks of infant mortality were not as prominent compared to the rates New York and Chicago experienced, New Orleans saw significant spikes in infant mortality rate in early summer (Condran and Lentzner 2004). This increase was likely due to the initial temperature increase, associated lack of sanitary drinking water, and inadequate refrigeration of milk. Infant mortality rates impact overall life expectancy. As a result of the increased infant mortality rate in New Orleans, U.S. Census data reports that the life expectancy for a ten-year-old in 1880 was only around 40 years, making overall life expectancy 50 years; this was among the lowest life expectancies among large American cities (Click Americana 2018).

Among infectious respiratory diseases, tuberculosis was another deadly disease prevalent during the nineteenth century (Preston and Haines 1991). Tuberculosis was responsible for approximately 15% of deaths for individuals 15 and older; in fact, it was the most common cause of death for adults aged 25-45 (Friedan et al 2000, Preston and Haines 1990). It was also responsible for 2% of deaths below age 15 (Preston and Haines 1991, 6). However, Preston and Haines (1991) also argue that, because symptoms of

tuberculosis were not as obvious in children and infants, there was a drastic underreporting of this demographic dying from the disease. As a result, the public paid more attention to diarrheal diseases causing more dramatic bouts of death, sweeping tuberculosis and pneumonia under the metaphorical rug of concerns. Nevertheless, these respiratory infections affected individuals by the thousands. The most common symptoms were excessive coughing and fever, often resulting in death. While Black populations had developed some resistance to yellow fever, they actually experienced higher death rates as a result of tuberculosis (Preston and Haines 1991, 10).

Overall, diseases ran rampant throughout New Orleans as a direct result of the Industrial Revolution. Overcrowding, unsanitary conditions, influx of immigrants, and absence of clean water resulted in mass deaths throughout the United States, particularly in Southern regions. Mass death as a result of disease coincides with the "beautification of death" movement that also flooded the nation in the nineteenth century.

The Beautification of Death: Its Impact on New Orleans Cemeteries

Yellow fever and other diseases sparked by unsanitary conditions, improper storage of food, and absence of clean water made death a prominent fixture in nineteenth-century New Orleans. During this era, a movement referred to as the "beautification of death" was sweeping the nation (Bell 1990, Little et al. 1992, McDowell and Deetz 1989, Upton 1997). It encouraged a romanticization of death, resulting in individuals becoming more concerned with the appearance of caskets and coffins, actual burial sites, and even wording used in obituaries. This movement likely influenced the change in how the city began to enshroud the deceased.

Life and death in New Orleans often mimicked one another in a contemporaneous irony. Prior to the 1830s, the dead in New Orleans were frequently buried in a watery grave due to the city's topography and geographical situation (Upton 1997). Because the city sits below sea level, graves filled with water quickly. When the beautification of death movement began to sweep through the country, New Orleanians became more concerned with how their dead were being interred. As a result, this began to manifest in a dry resting place for the dead who had endured a wet, soggy, and miry life. Thus, the introduction of above-ground tombs and mausoleums began to take precedence (Upton 1997). Although these tombs were initially hastily and sloppily constructed, French influence drove the emergence of intricate and often intimate designs and architecture of these mausoleums. Due to the rate at which these tombs and mausoleums were erected, New Orleans quickly earned its famous claim to being "a city of the dead."

Fours, which were "boundary walls of the cemeteries or…freestanding structures scattered throughout them" containing vaults, grew much more numerous than the eccentric mausoleums scattered throughout many cemeteries (Upton 1997, 138). Some of these fours were built by the city, but others were constructed by private cemetery owners. Upton (1997) writes: "The public fours were rented for a period of twenty-five or fifty years, then emptied and reused" (138). When a new burial was interred in a vault, remains previously placed in them were not removed but rather pushed towards the back of the vault. The cemetery related to this paper, Cypress Grove, utilized this burial style, which I will go into more detail about later.

Catholics and Creoles, as well as many other ethnic identities within the city, began to place high importance on the conditions of final resting places for dead loved

ones, creating “a landscape within which love and sorrow could openly and comfortably [be] expressed for the benefit of mourner and observer” (Upton 1997, 141). November 1, named All Saints’ Day, allowed for the living of all races, ethnicities, and religions to join together to celebrate the lives of those they had buried; celebration of the deceased included decorating tombs with wreaths and flowers and washing the inscriptions upon nameplates in the cemeteries (Upton 1997, 141). Regardless of what tensions still existed between and among different ethnicities in the city, mourning the dead became a way for everyone to come together with a common goal in mind: to memorialize their loved ones.

The beautification of death movement, as stated earlier, had an impact on the types of coffins that were used for the deceased. In the U.S., wooden coffins made of pine were the standard and affordable option for most individuals during this time period as they were priced at around two or three dollars (Northwoods Casket Company n.d.). After the Civil War, they typically possessed ornate and intricate decorations (Donison 2021). Coffin handles typically presented intricate engravings that sometimes referenced religious symbols, such as the ones present in the study conducted by Little et al. (1992, 410). Brass was a common metal used for these adornments, especially escutcheons, which were decorations used to cover screws and nails holding the coffin together. The designs of these escutcheons varied from being fairly simple to moderately elaborate. It was also common for these adornments to have a gold- or white-colored finish that added to the extravagance of some coffins, reflecting the desire for death to be viewed in a more aesthetic light.

However, iron coffins made headway as one luxurious burial option (Little et al. 1992, Owsley et al. 2006). These coffins were not as highly decorated (if at all), but they did accentuate the desire people had for giving their loved ones a formal burial. Crane, Breed & Co. was a notable manufacturer of cast-iron coffins during the mid-to-late-1800s. They gained exceptional popularity in the 1850s and 1860s and were relatively expensive at this point in time. According to Owsley et al. (2006), "wholesale prices in 1867 for adult-size [Fisk] Plain Case coffins ranged from about $30 to $53" (Crane, Breed and Co. 1867 as cited in Owsley et al. 2006, 92). Another reason these coffins gained such popularity is that, along with concern for beauty, people grew interested in how to best preserve their loved ones even after death. Iron coffins allow for incredible preservation of remains. There is some literature that details the analysis of remains interred in an iron coffin, though it is extremely limited (Little et al. 1992, Owsley et al. 2006, Rensberger 1988). I hope to contribute to this literature in my analysis as one of the individuals from the vault I excavated was interred in an iron coffin.

Cypress Grove Cemetery

Cypress Grove, located on City Park Avenue, is one of nearly 150 historic cemeteries in New Orleans (New Orleans n.d. b). The cemetery was founded in 1840 by the Firemen's Charitable and Benevolent Association (FCBA) not only as a burial location for different brotherhoods of the numerous fire companies but also for public use (Black 2022). Cypress Grove was constructed in a manner that allowed for a more noble display of mortuary practices in comparison to cemeteries built before it; as a result, walls containing these grave vaults referred to as fours were built along two sides of the cemetery (Black 2022). The construction of the cemetery was likely influenced by a

number of factors including the beautification of death movement, local concerns about overcrowding in other cemeteries, and the overall issue of watery graves present throughout the city. Cypress Grove was also in a more rural location during its initial construction, making it a bit more appealing to the citizens of New Orleans (Black 2022).

Plots throughout the cemetery ranged in price according to location and the year they were purchased; they were as cheap as $16 and as expensive as $300 in 1855 (Black 2022, 5). Prices of fours varied by tier. Cypress Grove sold these fours "for $50 for locations in the lower tier, and $55 for spots in the three upper tiers. By contrast, 14-by-16-foot lots sold for $82.88 to $127.68, exclusive of the cost of the mausoleum, which typically ran from $200 to $1,000" (Upton 1997, 138). The pricing of these grave vaults likely led to more use among middle-class citizens, whereas the upper class had a higher likelihood of purchasing the more expensive plots in the cemetery. Cypress Grove placed a high priority on ensuring that the deceased had a dignified resting place, which is reflected in the mortuary architecture of the cemetery. Revival style design heavily influenced cemetery architecture during the nineteenth century, and even Egyptian revival style made headway with the construction of Cypress Grove's gates that can be seen when one enters the cemetery (McDowell and Deetz 1989).

Cypress Grove holds high historical importance for its availability of plots during a time of population growth in the Crescent City; however, it is lacking in diversity. Burial records from the early 1850s illustrate that the individuals buried in the cemetery are overwhelmingly White, suggesting that people of color may not have been able to afford the plots and vaults within the cemetery. The individuals I analyzed were interred

in the cemetery at a time when social change was at its highest, making them some of the most reliable informants about what life was like during this time period. My goal is to reconstruct these individuals' lives holistically through the use of an osteobiography.

Osteobiographies: Utilization and Importance

Osteobiographies tell the story of an individual through their bones. They incorporate skeletal analysis alongside archaeological, historical, and societal context in order to construct a personal narrative of what their lives were like in a holistic perspective. Osteobiographies were introduced in 1972 by Frank and Julie Saul when they were attempting to reconstruct the lives of Maya remains; since the method's introduction into the world of bioarchaeology, it has shifted toward employing more interdisciplinary research and collaboration rather than solely relying on skeletal analysis (Hosek and Robb 2019, Pfeiffer 2022). However, appropriate analysis of skeletal remains for a variety of indicators of health and activity patterns is still the backbone for osteobiographies, as it plays a crucial role in understanding the lives of individuals alongside the appropriate application of historical and societal contexts (Pfeiffer 2022).

In the early days of bioarchaeology, many osteobiographies focused on the larger population data at hand (Hosek and Robb 2019, Pfeiffer 2022). However, this meant that individuals who were unique were excluded from the data and not given the necessary attention. These outliers could offer some significant contributions as to what other important identities also comprised the larger population. In recent years, osteobiographies have been increasingly used to reconstruct the lives of common people whose individual stories were excluded from broader data consideration. With that said, it is important that we do not look at these individuals as isolated "specimens" for research

purposes. These are human beings who lived an entire life, and they must be treated as such in terms of ethical and academic considerations. Thus, they aid in the restoration of humanity through academic research.

Biological bodies are not entities that operate in isolation, but in conjunction with time and place (Hosek and Robb 2019). By incorporating findings from mortuary practices as well as historical records, bioarchaeologists and other anthropologists can essentially reconstruct the life of an individual and provide a deeper more holistic understanding of their lived experiences, including greater exploration of the number of aspects that play into identities. I hope to provide an intrinsic and detailed analysis of the individuals I exhumed from the Cypress Grove cemetery in order to incorporate their unique stories into bioarchaeological literature.

CHAPTER III: MATERIALS AND METHODS

This chapter discusses what methods were used in the excavation and analysis of the three burials in the grave vault of Cypress Grove Cemetery in New Orleans.

Field Methods

This particular vault was chosen on the basis of its contents. Prior to excavation, the wall containing a plethora of grave vaults was heavily dilapidated and was in need of demolition due to its frail state. NOLA Cemetery Renewal, under the direction of its owner, Nick Black, was given the contract for the demolition. With the approval of the cemetery board, students at the University of Southern Mississippi were given the opportunity to analyze human remains within these vaults. I selected my particular vault due to the presence of an iron coffin and well-preserved human remains.

The recovery efforts took place on April 8 and 25, 2022. The opening of the vault I analyzed was covered by a thin layer of plaster which was carefully broken apart by Mr. Black. Before a formal excavation began, the vault was photographed in detail to fully capture the contents in situ. In addition to photography, the vault was measured for its depth, height, and width. Any debris from the broken plaster was removed, and any dirt near the opening of the vault was removed and screened. Measurements were taken of the bones from the first set of remains accessible within the vault to indicate their location. Mapping of bone orientation was completed using these measurements with the remains and mortuary artifacts subsequently removed (Figure 1). The same process continued in multiple sections of the vault moving toward the rear until the iron casket was reached.

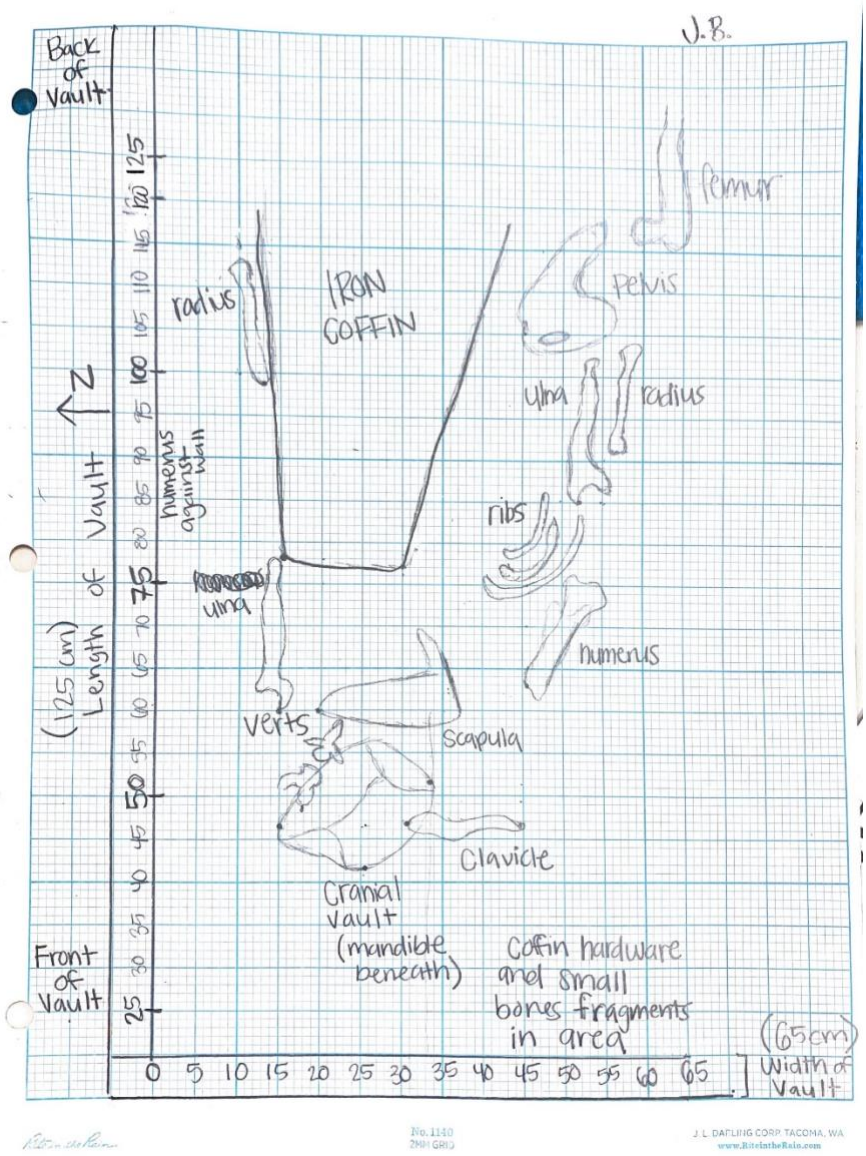

Figure 1: Map of the front portion of the grave vault excavated at Cypress Grove.

The iron casket was fully intact, and it was determined it could be removed by hand from the vault; its various dimensions were then measured. A thick layer of sediment possessing a mud-like consistency was present within the coffin and was water screened. On the surface of the coffin were bones that appeared to belong to the individual encountered in the initial part of the vault; several larger pieces of wood were associated, suggesting a wooden coffin had been placed on top of the iron coffin in the

vault. These remains were removed first after having been mapped. Another set of remains belonging to the individual interred in the iron coffin were then encountered. The sediment was screened in sections moving from the front to the rear of the coffin while also pedestaling the bones encountered. Once the remains were fully exposed and had been mapped (Figure 2), they were retrieved. The soil remaining in the coffin was removed and screened, as before.

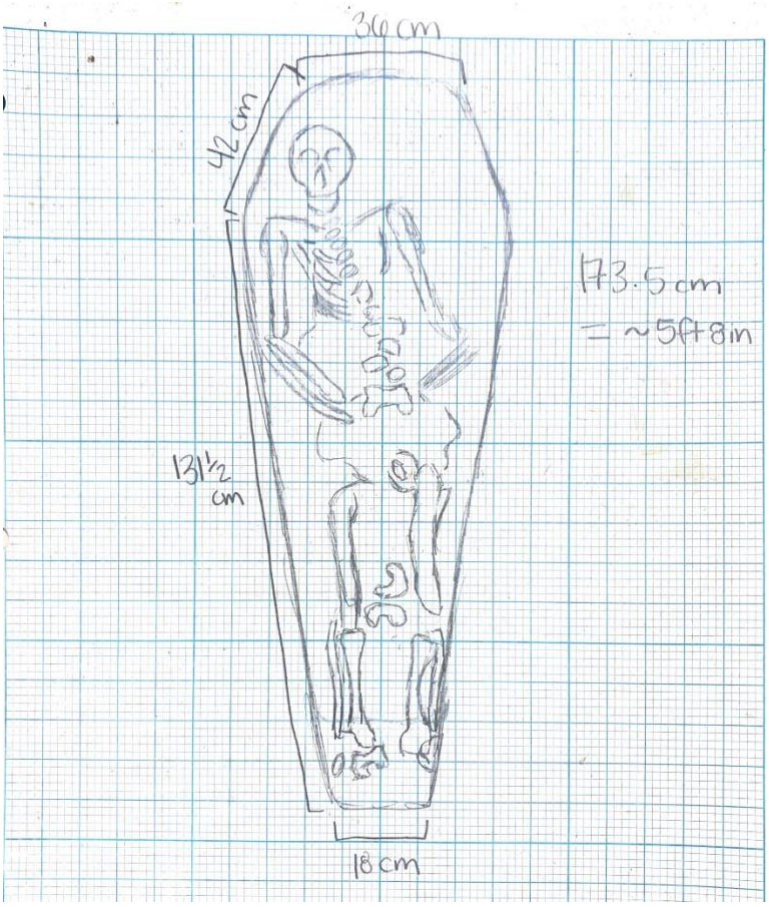

Figure 2: Map detailing relative bone placement within the iron coffin excavated from vault 1880B of Cypress Grove.

Efforts then returned to the vault proper. The process of screening dirt in sections continued until all materials were obtained; however, mapping and measurement of bone orientation ceased once the iron coffin was removed due to the large pile of disarticulated

bone fragments found at the rear of the vault. These remains were recovered en masse for further sorting in the lab.

Features of the vault were bagged separately in paper bags and organized as coffin hardware, clothing items, culturally associated material, etc. Bones from each burial were also bagged in paper bags to allow them to dry and were labeled according to their assumed correlating burial.

Laboratory Methods

Once the human remains and all associated burial features were excavated, they were transported to the University of Southern Mississippi (USM) Biological Anthropology Laboratory. All bones were separated according to which individual they belonged and then, identified, sided, and cleaned using a brush with soft bristles to remove excess dirt. Burial features were also cleaned using the same method, including delicate pieces of coffin hardware. Wooden items were left out to dry but were not cleaned due to their fragile state.

Mortuary Archaeology Analysis

To analyze coffin hardware, identifiable features were dated using online resources. Donison (2021) includes catalog images in comparison to the coffin hardware discovered in a nineteenth-century cemetery, which was particularly useful for dating tacks, escutcheons, and handles associated with the wooden coffin. Owsley et al. (2006) and Rensberger (1988) were useful for dating the iron coffin features, and Bell (1990) provided information on both wooden coffin hardware and iron coffins. In addition, a number of artifacts found associated with the burials (such as cloth and coffin hardware) was analyzed for composition by Sara Bayley, laboratory manager at The Mississippi

Polymer Institute. Thomas Patterson, a faculty member in the USM Geography program, was consulted for the composition of wood found in the grave vault.

Osteological Analysis

The standards used to inventory and analyze the three sets of human remains within the vault were selected from the techniques listed in the *Standards for Data Collection from Human Skeletal Remains* (Buikstra and Ubelaker, 1994). Osteological elements important to aging the individuals included the pubic symphysis and the auricular surface of the os coxae; cranial suture closure was used as a secondary form of aging. Dental wear was also used as a method of aging. Sexing these remains heavily relied upon elements of the os coxae, specifically the greater sciatic notch and the preauricular sulcus. Cranial elements such as the mastoid processes, supraorbital margin, and mental eminence were of particular importance for sexing; size of postcranial elements, such as musculoskeletal attachment sites, were also used for sex estimation. Stature was estimated using the regression formulae of Trotter and Gleser (1958). Ancestry estimation was based on Hefner et al. (2015) using macroscopic observation of cranial traits.

Bones were visually analyzed for any indications of abnormalities/pathologies, trauma, and nutritional deficiencies. Dentition was assessed for pathologies such as caries, linear enamel hypoplasia, attrition, or cultural modification. All joint surfaces were examined for evidence of arthritis. Cranial vault surfaces were observed for indications of anemia, and all bone surfaces were examined for infection and trauma.

All archaeological items and osteological elements were recorded, analyzed, and dated when possible. Some osteological elements were considerably modified by

taphonomic changes, so analysis is dependent upon preservation. Using all of the aforementioned materials and methods, the next chapter will include an analysis and discussion of findings.

CHAPTER IV: RESULTS AND DISCUSSION

This chapter will discuss the results from the analysis of human remains from the three burials interred in the grave vault I excavated at Cypress Grove Cemetery. The chapter is divided into five sections: grave morphology, material culture, coffin hardware, osteology, and osteobiography. Burials are labeled based on their chronological position within the vault; Burial 1 had most recently been placed within the vault, with Burial 2 following as the next most recent, and Burial 3 as the remains in the vault for the longest amount of time. While most discussion in this section revolves around skeletal analysis, it also encompasses material culture and coffin hardware found within the grave vault.

Grave Morphology

The vault was located in the east wall of the Cypress Grove Cemetery near the middle of its 650-foot length (Figure 3); a segment of the wall, although not necessarily the side containing the excavated remains, may be seen in Figure 4. Because the wall was beginning to present heavy degradation, it was to be demolished and all human remains were to be removed from the vaults. This specific grave vault was chosen to be analyzed due to the apparently good preservation of the remains within. All three of these burials were interred in the same four as described in the literature review. The grave vault measured 125cm in length (from the entrance of the vault to the rear), 60cm in height, and 65cm in width. The grave vault was located on the second tier of the wall which presented some dilapidation but was structurally sound. The grave vault was labeled 1880B by Nick Black, who is heading the restoration project at Cypress Grove, but the notation was only for his personal notes and does not refer to any other labeling system.

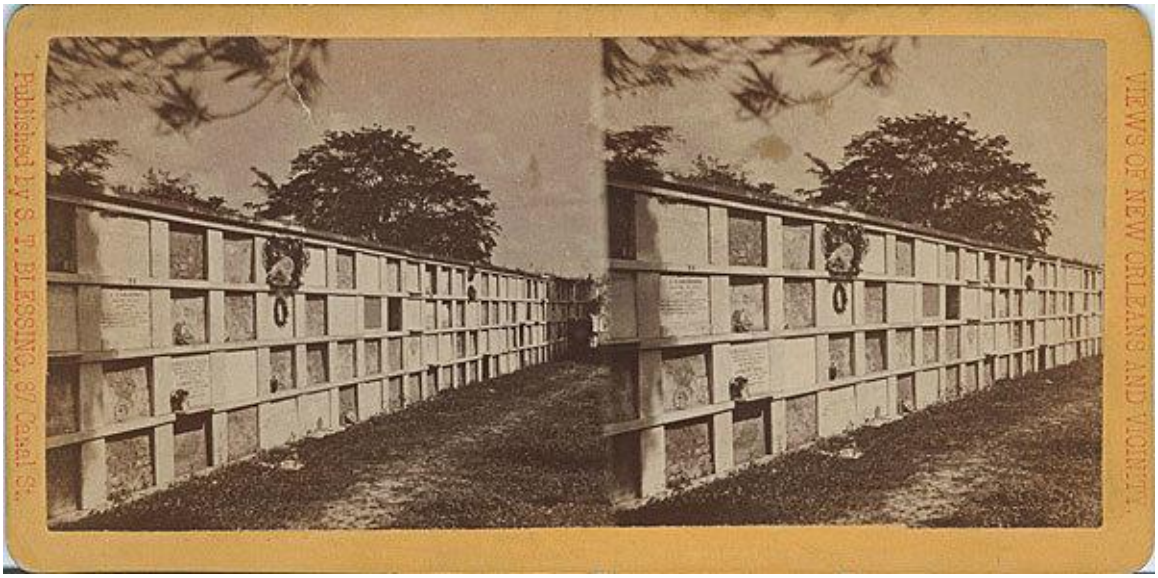

Figure 3: Vaults of Cypress Grove Cemetery in 1875. Louisiana Digital Archives.

Figure 4: Satellite map of Cypress Grove Cemetery in New Orleans.

Upon inspection, three individuals were determined to reside within the vault. The most notable burial is an individual buried in an iron coffin and interred in the vault. The individual labeled as Burial 1 had obviously been laid in a wooden coffin atop the iron coffin. The remains within the iron casket were labeled as Burial 2. A number of disarticulated remains were found in a pile pushed to the rear of the vault. After the analysis of this group of human remains, it was determined that all belonged to the same

individual, who was labeled as Burial 3. Thus, there were three people represented in total.

Coffin Hardware

The mortuary hardware within the vault is representative of what was typically used during the late nineteenth century, especially the iron coffin (Bell 1990, Donison 2021, Owsley et al. 2006). While the exact year of the coffin hardware cannot be pinpointed, most hardware was dated to the decade based on certain stylistic choices that were incorporated into caskets and coffins using the figures illustrated in Donison (2021) and the information included in Bell (1990) regarding coffin hardware used in the nineteenth-century cemetery they analyzed.

Over 100 pieces of mortuary hardware were recovered from the grave vault, excluding the actual iron coffin; the iron coffin was left at the cemetery due to a lack of adequate transportation for the coffin due to its size and weight and a lack of space to store it on campus at USM. Most hardware recovered from the grave vault appears to pertain to Burial 1, as most of the hardware is still attached to the wood fragments from the coffin the individual was buried in.

Burial 1 was laid to rest in a wooden coffin, which was determined to be made of cypress (Thomas Patterson, personal communication). Ornate decoration for this burial is exemplified through the coffin handles, thumbscrews, and escutcheons also found within the grave vault. Five casket handles of the same design were located within the grave vault; six handles are typical for these caskets, so it is unclear why the sixth handle is absent. Figure 5 illustrates the design of these handles, and they appear to be swing-bail handles similar to the ones present on the iron coffin.

Figure 5: Swing-bail handle of wooden casket from Burial 1.

Six thumbscrews of the same design were included in the coffin hardware. According to Donison (2021), these thumbscrews resemble those primarily used in the 1880s. Figure 6 illustrates the variety of thumbscrews available during this time period in comparison to those that were found within the vault; they are almost identical to the No. 7 screwplate in Figure 6. There were also six screws that appear to have possibly articulated with these thumbscrews, although comparison using the information from Donison (2021) was not possible due to their degeneration.

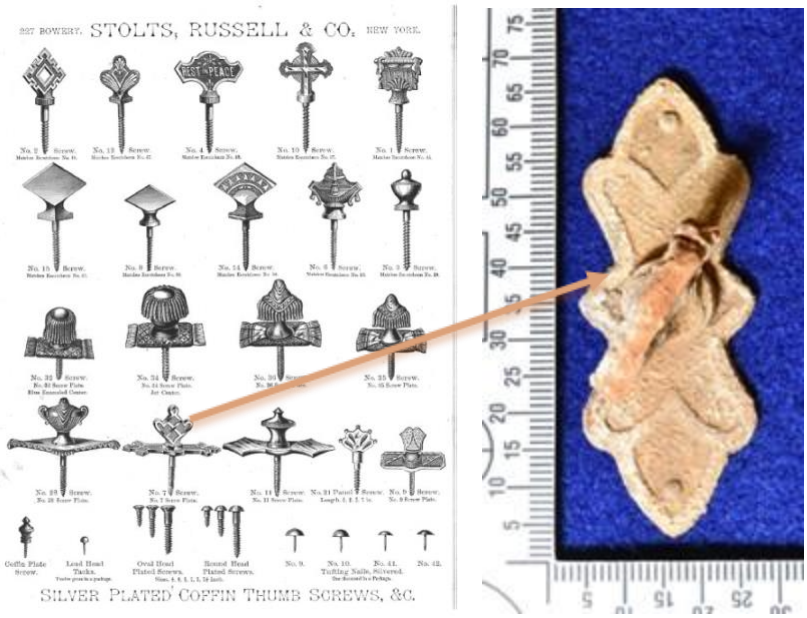

Figure 6: Stolts, Russel & Co. catalog detailing the variety of thumbscrews available during the 1880s, as taken from Donison (2021), in comparison to one thumbscrew from the wooden coffin of Burial 1.

Fifty complete or near complete escutcheons were also recovered from the grave vault; escutcheons are thin, decorative pieces of metal used for ornamentation on coffins that sometimes function as screwplates. Fragmented pieces from other escutcheons not included in this count were also present, so the estimated total of escutcheons is closer to 60. Two of these escutcheons still retained a golden, metallic shimmer (Figure 7); chemical analysis found that these were made of brass, which was common for hardware composition in the nineteenth century (Little et al. 1992). The number and design intricacy of these escutcheons illustrate the importance placed upon some degree of elegance and romanticization of death, reflective of the beautification of death movement of the era.

Figure 7: Two escutcheons taken from the wooden coffin of Burial 1 that still possess a gold shimmer

Five tacks and ten nails were also collected from hardware believed to belong to Burial 1. The tacks closely resemble a design that was popular in the 1870s (Donison 2021). Like the screws, the nails are heavily rusted and present a thick layer of corrosion, making it difficult to discern if they are nails or thumbscrews. However, the nails are longer than the screws, which is the only feature that distinguished the two. Lastly, nine metal pieces I believe to be hinges were obtained from the vault; one of these hinges was embedded in the right eye socket of Burial 2, evidently falling into that position during decomposition of the coffin. All of these hinges are still attached to wood remnants from the articulating casket. These hinges are also heavily altered from taphonomic changes and any design that may have been present is unobservable, making these impossible to date.

For Burial 2, the iron coffin is torpedo-shaped and possesses straight sides and appears to have had a glass viewing case covering the entire top of the coffin based upon the volume of shards recovered (Figure 8). This coffin closely resembles a Fisk Plain Case Model No. 3 (Allen 2002, Donison 2021, Owsley et al. 2006). It was patented in 1854 and produced by Crane, Breed & Co. after the Civil War, which means this burial likely occurred any time between the 1860s-1890s (Allen 2002). These coffins have six swing-bail handles, three on each side. The coffin pertaining to this burial has three handles still attached; however, the other three that should have been identical to the ones still attached to the coffin were not present in the grave vault. It is unclear why these handles were absent.

Figure 8: Iron coffin of Burial 2 after removal from the grave vault.

Burial 3 was also likely buried in a wooden coffin because this was the most typical mortuary container, although no wood fragments nor obviously associated coffin hardware were found; however, some of the hardware associated with Burial 1 might have belonged to this individual.

The coffin hardware suggests that the families of the interred individuals were likely middle-class, especially since iron coffins were relatively expensive during the nineteenth century. The coffin hardware associated with Burial 1 was advertised to middle-class individuals through catalogs, further implying that the family or families were of moderate means. Overall, it appears that Burial 1 took place any time from the 1870s-1890s, Burial 2 was interred any time between the 1860s-1880s, and Burial 3 was entombed any time after Cypress Grove's initial opening in 1840. Around the turn of the century, coffin hardware began to be much less detailed. Short bar handles replaced swing-bail handles in popularity beginning in the late nineteenth century, and by 1900, they became the predominant handle type on coffins and caskets (Donison 2021). Because the coffin hardware in the vault I excavated predates this decorative trend, it is likely that the vault was no longer in use at the turn of the century.

While using hardware can be incredibly useful to determine when an individual was buried, there are a few limitations. Coffins and their associated styles are determined by the socioeconomic status of the individuals purchasing them, what styles were popular at a given timeframe, and the availability of certain styles. However, given that the multitude of different coffin hardware presented in Burials 1 and 2 was consistent with the same time frame, it is likely that these individuals were interred when coffin hardware had reached peak popularity; for example, it is more likely that Burial 1 was interred at a time when swing-bail handles still retained social popularity because all other coffin hardware that could be dated resembles what was popular during the same time period. Thus, the most likely dates for vault usage are 1840-1890s with a greater likelihood

toward the latter end, which is consistent with the time frame that vaults could be rented (Nick Black, personal communication).

Material Culture

The material culture within the grave fault was minimal with most of the material culture pertaining to coffin hardware. However, eight definitive buttons were retrieved, which are believed to belong to Burial 1 based on their proximity to the bones of this individual. Five white buttons (two large, three small) and three white, iridescent buttons suggest that these belonged to two different articles of clothing. The iridescent buttons were tested for their chemical composition using *scanning electron microscopy (*SEM*)* analysis, and it was found that they were made of shell. All buttons were fully intact, but the shell buttons did present some chipping and cracking, likely from taphonomic degradation. In addition to these buttons, six circular items that could potentially be buttons of a uniform were also found. Due to their worn and rugged appearance, it cannot be said for certain that these are buttons; another possibility is that they are some sort of coffin hardware, likely the top of a tack or a caplifter, belonging to the coffin of Burial 1.

Burial 2 had the largest amount of material culture, most pertaining to the apparel of the individual. Several pieces of cloth were obtained from within the iron coffin, though color and exact chemical composition are unclear due to weathering and degradation of the material. However, a ribbon was located in situ within the hair preserved from the individual in Burial 2. The individual's bones presented phenomenal preservation due to their interment in the iron coffin, and as a result, it appears that practically all hair on the scalp of this individual was obtained. Due to the length of the individual's hair and the presence of a ribbon wrapped within the hair, it was postulated

that the gender of this individual was female; the ribbon was determined to be silk using SEM analysis.

Not only were cloth and ribbon preserved within the iron coffin, but three metal facets were also included. They likely belong to the clothes that the individual was buried in. The facets appear to be fasteners that would be attached to a piece of cloth or sewn into clothing to fasten together two sides of the back of a dress or the front of dress pants. A small needle was also found within the iron coffin, which was likely used to pin clothing together.

Burial 3 had no evident associated material culture. Preservation of this individual was in the poorest condition of the three burials as the bones presented extreme weathering. It is possible that some of the buttons found within the vault belonged to the apparel of this individual, though it is unlikely for a few reasons. First, bones of this individual were heavily fragmented from taphonomic changes (such as flooding, heat, insect activity, and natural decomposition), so it is unlikely that less durable items such as clothing would have survived. Secondly, because this individual's remains were found only at the rear of the grave vault, it is likely that any material culture would have been pushed towards the back by insertion of the iron coffin along with skeletal remains. Lastly, it appears that this individual was the first person to be placed in the grave vault and, thus, had been there for a longer time than the other two burials. At the time of Cypress Grove's initial use, it was common for individuals to have their loved ones removed from surrounding cemeteries in order to be buried elsewhere "to give them a more dignified place of rest"; Cypress Grove was a cemetery where individuals could

reinter their relatives (Black 2022, 3). Thus, it is possible that the four in Cypress Grove could have been a secondary burial for the individual in Burial 3.

Osteology

Burial 1

Burial 1 appears to be a White, middle-adult male whose remains were moderately preserved in the grave vault. The vault portion of the skull was largely intact, though the facial bones below the supraorbital margin were not present. Other skeletal elements observed for this individual include the mandible, teeth, most of the os coxae (excluding the left pubis), clavicles, scapular bodies, most centra and neural arches for vertebrae, seventeen ribs, the sternal body, and all long bones. The hand and foot bones were relatively well preserved, especially the foot bones that were recovered within the iron coffin.

Using primary aging techniques, the right pubic symphysis scored a 9 using Todd (1920) standards and a 6 following Suchey-Brooks (1988) standards, strongly supporting that this individual was likely around 40-50 years old at the time of his passing. The auricular surface of the pelvis was also used as an aging technique; the left auricular surface was scored as a 6 and the right as a 7 using standard outlined in Lovejoy et al. (1985), although weathering of the bones impacted the appearance. The age range estimated using the auricular surface is 45-50 years old. Although portions of the cranial vault were missing, the sutures that were present were scored using the Meindl and Lovejoy (1985) standards outlined in Buikstra and Ubelaker (1994). All sutures were scored to be either significantly closed or completely closed, further demonstrating that

this individual was of middle age (35-49). Teeth also present some moderate wear, especially on the five molars that were present.

Sex is a biological characteristic and is often reflected in certain skeletal markers, especially on the pelvis and cranium. In contrast, gender is a social construct, and material culture often reflects the gender identity of the deceased. Sex was estimated using the greater sciatic notch and the preauricular sulcus of the ilium. The overall score using these two skeletal markers was a 4, reflecting that the individual is a probable male in the 5-point standard developed by Buikstra and Ubelaker (1994). In addition to using skeletal markers on the pelvis, cranial elements (mastoid process, supraorbital margin, and mental eminence) were also used to sex the individual; the scores for these traits were 4 or 5, further confirming that this individual was male. The head of the femur was not present, but the right tibia was well-preserved and hence used as a basis for sex estimation. The maximum diameter at the nutrient foramen of the right tibia measures 37.8mm, which is within the male range (Šlaus and Tomičić 2005). Burial 1 also possessed robust muscle attachments on the long bones, which is more characteristic of males than females (Foster et al. 2014). Because no material culture gave insight into his gender, it is assumed that his gender identity aligned with his sex.

Six mandibular teeth were still located in the alveolar process of the mandible and included all premolars, the right canine, and the left first molar. All of these teeth are carious aside from the right canine. As previously stated, these teeth presented heavy wear. Eight isolated teeth found within the grave vault also likely belonged to this individual, although there is a possibility they might have been from Burial 3. However, these eight isolated teeth were closer in color and size to Burial 1 than Burial 3. One of

these teeth, a maxillary premolar that could not be sided, is obviously carious; other maxillary teeth that were complete or near complete in preservation showed no signs of caries. It also appears that this individual may have lost all mandibular incisors and his mandibular left canine antemortem.

Ancestry was tentatively estimated to be White using standards outlined in Hefner et al. (2012). While many of the facial bones were absent, the cranial vault was intact; the shape of the cranial vault as well as the retreating nature of the small portion of the left zygomatic present are the only suggestions that this individual was White. No incisors were present for this individual, so potential shoveling could not be observed. However, the possibility that he was Black or Asian cannot be eliminated. Furthermore, the fluid nature of biological traits as well as the social construct of race in the US must be kept firmly in mind (Dunn et al. 2020).

Stature was calculated using the long bone regression method for White males associated with Trotter and Glesser (1952). Some of the long bones were fragmented at either epiphyseal end, so maximum length was estimated. Using the length of left humerus, right radius, left ulna, left femur, right tibia, and left fibula, the estimated final stature of this individual was 171-177cm (5’7”-5’9”), which was the typical height for the time for Southern White males (Maloney and Carson 2008, Meadows and Jantz 1995).

The only pathology present on the bones was moderate arthritis on the proximal ends of both ulnae, proximal ends of both tibiae, and phalanges of the feet. Figure 9 illustrates lipping present on the proximal end of the right ulna. No linear enamel hypoplasias are present on the teeth of this individual, although caries are fairly numerous in the mandibular teeth still in socket and on an upper premolar. It appears that this

individual may have lost all mandibular incisors, the left mandibular canine, and the left second mandibular molar antemortem. This individual presented no fillings or additional dental work.

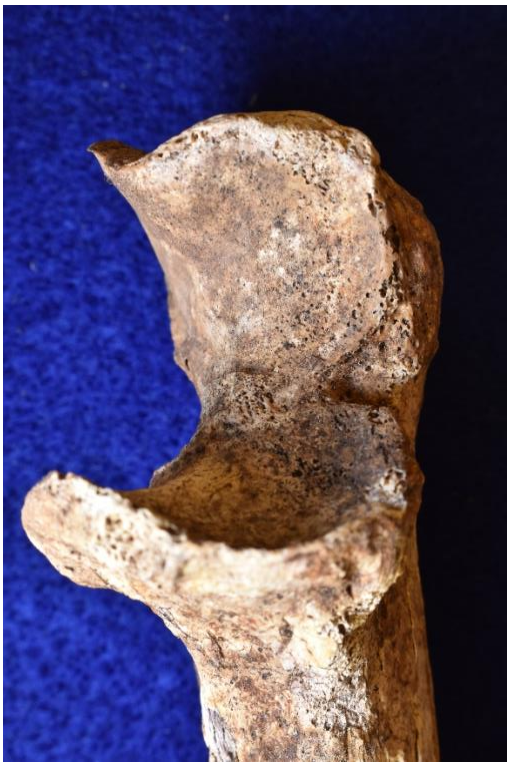

Figure 9: Lipping suggestive of arthritis on the proximal end of the right ulna of Burial 1.

Burial 2

Burial 2 consisted of a nearly complete skeleton; the only bones missing from this individual were the body of the sternum, a right tarsal, and a left metatarsal. The dentition of Burial 2 was also extremely well preserved. All mandibular teeth and seven maxillary teeth were still in their alveolar socket. However, the individual is missing the alveolar socket for the left lateral mandibular incisor; this tooth is one of the most common to be congenitally missing, which possibly is a genetic mutation (Rakhshan 2015). The permanent mandibular right lingual premolar and maxillary occlusal right and left

premolars were about to erupt prior to death. The iron coffin allowed for the excellent preservation of the bones, making osteological analysis exceptionally easy. The individual had her hands laid near her pelvis prior to burial, which can be seen in the map in Figure 2.

Most of the long bones present a lack of epiphyseal fusion, confirming that the individual interred in the iron coffin is a subadult. Bones showing partial union include sacral segments, the ischiopubic ramus, the medial epicondyle of the right humerus, and the proximal epiphysis of the left ulna. All vertebrae and occipital sutures (lateral portion to squama and basilar part to the lateral part) show complete union.

Standards outlined in Baker et al. (2005) aided in age estimation through epiphyseal fusion. Partial fusion of the medial epicondyle of the right humerus suggested that this individual was around 15-20 when they died (Figure 10). Partial fusion of the proximal epiphysis of the left ulna suggested this individual was aged 12-15 (Figure 9). However, both femoral heads were completely unfused, suggesting this individual was 9-12. Based on these findings, the individual was likely 12-15 years old at the time she passed away (White and Folkens 2005). The final age range is estimated based upon the majority of bones presenting lack of epiphyseal fusion, and an older age range would not be conclusive because other bones would have presented fusion.

Figure 10: Partial epiphyseal fusion of the medial condyle of the right humerus (left) and partial epiphyseal fusion of the proximal left ulna (right) of Burial 2.

Dental development also supports this age estimation; several deciduous molars were still present and the permanent second molars had erupted just prior to death, placing her age at 9-13 (Ubelaker 2018). Since growth had not been completed, stature was not estimated. However, maximum diaphyseal length of the femur, tibia, humerus, radius, and ulna was measured to further aid in age estimation. As seen in Table 1, the long bone lengths of Burial 2 are typical of a child a few years younger than the estimated age from dental development; L refers to left and R refers to right. This suggests that the individual's growth possibly might have been compromised by the health disturbances she experienced earlier in life as evidenced by the multiple hypoplasias.

Table 1: Measurements of maximum diaphyseal length used to estimate age (Scheur and Black 2000)

Bone Dimensions	Length (mm)	Age Indication
R Femur	340	9-10 y
L Tibia	281.5	9 y
L Humerus	237	10 y

R Radius	177	9 y
R Ulna	194	10 y

Ancestry for this individual was also estimated to be White due to a number of features (Hefner et al. 2015). The incisors present no shoveling. The nasal aperture is narrow, and the nasal sill is fairly sharp. Zygomatics for this individual are also not pronounced nor robust.

Because this individual is considered a juvenile, sex estimation is not possible since sexually dimorphic characteristics of the skeleton would not have yet fully developed. The size of the permanent teeth, however, was very small, which would suggest a female. Gender was also estimated to be female based on associated material culture. Based upon the length of the preserved hair as well as the presence of a ribbon within the hair, it is incredibly likely that this individual was a young girl who had not quite reached puberty. The ribbon also suggests that her hair was styled prior to burial.

In pathological analysis, the deciduous premolars exhibit severe caries. Four teeth, all canines, present a moderate linear enamel hypoplasia, all measuring 3.1 mm from the cemento-enamel junction; this indicates that the episodes would have formed around age 4-4.5 (Ritzman er al. 2008). Linear enamel hypoplasias illustrate non-specific stress events endured during childhood when enamel was forming. More slight episodes of hypoplasia can also be seen on the three mandibular incisors and the right lingual premolar of the mandible; Figure 11 depicts mandibular episodes of LEHs. Aside from the LEH and two caries of the maxillary premolars, no other stress markers, such as anemia or infection, are present on the teeth or on any of the bones.

Figure 11: Linear enamel hypoplasias on the mandibular incisors, canines, and right lingual premolar of Burial 2.

Burial 3

Burial 3 was the least well preserved of the three burials. Hundreds of bone fragments were present from this individual, but their size and condition made most impossible to identify. Some could be distinguished, however, including portions of parietals and frontal bone; rib fragments; a right patella; vertebral fragments; distal ends of both humeri and femora; proximal ends of both radii, ulnae, the right tibia and both fibulae; carpals and metacarpals from both hands; tarsals and metatarsals from both feet; and 22 phalanges. Parts of the os coxae, including the left ilium and acetabulum, the right ischiopubic ramus with partial acetabulum, and a portion of the right pubis containing the symphysis, were recovered. The first three vertebrae were moderately well preserved, making them the only identifiable vertebrae; other portions of vertebrae, including five centra and neural arches of the thoracic and lumbar vertebrae, were also present. Seventeen teeth were also recovered for this burial, though identification is tentative due to incompleteness and degradation. While some of these teeth could belong to Burial 1,

their size and coloration do not align with the teeth that definitively correlated with Burial 1. Thus, they were assumed to be associated with Burial 3.

Unfortunately, sex estimation was inconclusive for this individual. The only standard marker that could be used was a portion of the sciatic notch, which scored a 3, indicating ambiguity (Buikstra and Ubelaker 1994). Other secondary markers also gave conflicting results. The superior and left portion of the sacrum was incomplete, so measurement of its anterior superior breadth was estimated to be 119 mm, closer to the male range (Steyn and İşcan. 2008). Additional measurements were estimated on long bones, tali, and the right pubic symphysis when available, but these were intermediate as well (Kanz at al. 2015, Gualdi-Russo 2007, Steyn and İşcan 2008). Results can be seen in Table 2.

Table 2: Bone measurements used to estimate sex.

Bone Dimensions	Measurement (mm)	Sex Indication	Citation
R Talus Length	54.9	Female	Gualdi-Russo 2007
L Talus *Le*ngth	57.7	Male	Gualdi-Russo 2007
R Femur Epicondylar Breadth	81.3	Male	Kanz at al. 2015
R Pubic Symphysis Length	33.7	Female	Steyn and İşcan 2008

Estimating the age for Burial 3 was also inconclusive, but most indicators suggest a middle adult. No distinguishable primary age indicators were present, aside from the pubic symphysis. However, this was also in poor condition. Estimates from the pubic symphysis alone suggest that the individual was likely around 30-40 years old at the time

of their passing. Although the joint surfaces of the long bones were also weathered, mild lipping on the right proximal ulna, proximal ends of some phalanges, and some thoracic and lumbar centra present evidence of some arthritis. Teeth recovered and presumed to correlate with this burial present fairly advanced wear, also suggesting that this individual was nearing or around middle age at the time of their passing.

Aside from mild suggestions of arthritis, no other trauma or pathologies could be identified amidst the poorly preserved remains. Two holes with a definitive circular shape are present on the portion of the left ilium, though they are most likely the result of postmortem insect activity (Della Cook, personal communication). The teeth that were complete showed no signs of caries or other lesions.

Stature was estimated using both first metatarsals using the formula outlined in Cordeiro et al. (2009). Stature using maximum length of the left MT1 was estimated to be 158.34 cm, and maximum length of the right MT1 yielded a stature of 159.45 cm. This individual would have stood at around 5'2", which is closer to typical female stature at the time (Meadows and Jantz 1995). Ancestry could not be estimated for this individual due to lack of relevant skeletal indicators as a result of fragmentation and degradation.

Osteobiographies

Burial 1

The identity of the individual interred in Burial 1 is unknown, but evidence shows that he was a middle-aged man who was fairly active throughout his life based on robust musculoskeletal attachments and presence of arthritis; these markers could indicate job position or past-time activities he may have frequently indulged in. He lacks any linear enamel hypoplasias, suggesting that he probably did not experience a particularly

stressful event during childhood. His stature is consistent with what was typical at the time as well, further supporting this hypothesis. Caries on six of the fourteen teeth are indicative that he likely had a diet high in carbohydrates and starches; this correlates with the diet prominent at the time which consisted largely of carbohydrate-rich cuisine. Dishes such as gumbo, rice, and gravy were notable cuisines in the 1880s (Oneal 1964, 79). Although caries are fairly numerous, no dental work is present, suggesting that this individual may not have had the means or resources for such care. Southern diets often also incorporated fruits, corn meal, and sugary pastries; Deer (1950) and Saunders et al. (1997) assert that Americans doubled sugar intake as a result of new sugar refining processes of the mid-1800s. Because Louisiana was such a prominent producer of sugar, residents of New Orleans and Louisiana often chewed sugar cane, another possibility of why this individual presented a high rate of caries (Dreizen and Spies 1952).

Given his associated coffin hardware, it can be hypothesized that the man or someone in his family was of moderate means. A majority of the escutcheons associated with his coffin were likely only for decorative purposes, and decoration such as the escutcheons and thumbscrews were heavily advertised to middle-class citizens through mortuary catalogs (Donison 2021). As a member of this socioeconomic group, he could have held a job that was viewed by the public as more professional; he could have been a businessman overseeing the consistent construction taking place in New Orleans, as an educator to his fellow citizens, or as a manager to a prominent business within the city (Wells 2009). With industrialization causing extemporaneous growth in the city, it is possible that this individual took advantage of the new opportunities and jobs that came with the rapid change of a growing city. Most of these jobs were exclusively only

available to White men, making the likelihood even more probable. Middle-class individuals also possessed more free time for leisurely activities, and during the nineteenth century, swimming and cycling became popular past-time enjoyments (Offutt 2010, Somers 1967). Hobbies that promoted physical activity and exercising would also reflect the robusticity of his muscle attachment sites.

Although it is unclear what ultimately led to this individual's death, it is probable that he could have been a victim of one of the many diseases overtaking the city. Yellow fever, tuberculosis, and diarrheal diseases were common well into the late nineteenth century; while these typically affected lower-class individuals due to exacerbated unsanitary conditions, anyone could contract yellow fever from a mosquito or a bacterial disease from infected water or something as minimal as a sneeze. Given his age, it is also possible that Burial 1 may have succumbed to a heart condition or cancer; heart disease was the most common cause of death in individuals over age 45 in Natchez according to sexton's records (Marie Danforth, personal communication). His age at death is also close to the average life expectancy in 1880, which was around 50 years (Click Americana 2018). However, this reflects the high infant mortality of the time; those who survived into adulthood generally lived somewhat longer than this age.

In addition to evidence that he may have been associated with the middle class, his coffin hardware suggests that his family deeply cared about how he was buried. The shell and plastic buttons which are assumed to be associated with the apparel of this individual likely came from a button-up shirt, illustrating that he may have been dressed nicely at the time of his burial. Because he was buried in a wooden casket and placed within the grave vault, utmost care and consideration was taken into the environment of

his final resting place. Grave vaults are often illustrations that families desired a dignified resting place for their loved ones, and this individual was ensured comfort in death by his interment in the grave vault. This man was likely cherished by his family, and he was afforded a beautiful and considerate burial.

Burial 2

The identity of the young girl in Burial 2 is also unknown; however, osteological analysis reveals that she died an early death. Death before entering adulthood was unfortunately common in the nineteenth century because bacterial and diarrheal diseases along with diseases transmittable through vectors claimed the lives of many children (Condran and Lentzner 2004, Curtis et al. 2007). In the nineteenth century, diarrheal diseases were the most common cause of death among infants; as a result, most newborns had a 50% chance of surviving to the age of five (Cndran and Lentzner 2004, Hopkinson 2000). As discussed in the literature review, nearly 60% of the deaths resulting from yellow fever in New Orleans consisted of children under 16 (Curtis et al. 2007). At the turn of the century, gastrointestinal diseases accounted for 20% of infant deaths up to age 14, and "respiratory diseases also accounted for 19% of deaths among infants and 16% of deaths among children aged 5-14" (Preston and Haines 1991, 3-6). The enamel hypoplasias seen in this child suggest that she experienced health disruptions earlier in her life. This would potentially indicate a generally weakened immune system, which can be associated with earlier ages at death (Armelagos et al. 2009).

The presence of clothing fasteners and a ribbon in her hair indicate that she was probably in her "Sunday best" and her hair was neatly styled prior to her burial. Great care was taken in regard to mortuary display, especially with the presence of the iron

coffin. Iron coffins were expensive, and typically only the upper-middle class and elite could afford such luxurious burial containers. Thus, her family was likely wealthy to some degree and wanted to provide her the most prestigious burial possible.

In the nineteenth century, families typically consisted of around five people in New Orleans, and it was not uncommon for individuals to have multiple children (US Census Bureau 1883, Guest and Tolnay 1983). It is possible that this subadult was the only child in their family who did not survive into adulthood; if the individuals interred in the grave vault all belong to the same family, they would have likely buried their other children in the vault as well.

In New Orleans during this time, middle- and upper-class white children of both sexes of the age of Burial 2 attended school (Guest and Tolnay 1983, 360). Toys such as dominoes and checkers were popular among all children, and little girls could usually be seen playing with dolls or "playing house." Young girls during this time period engaged in play that would eventually prepare them for the work associated with being a mother or a housewife (Hopkinson 2000). Because this young girl likely belonged to a middle-class family, it is not likely that she would have been sent to work in a factory as her working- or lower-class counterparts would have.

I can also ascertain that her family loved her a great deal. This degree of humanity is reflected in the mortuary context, especially with the presence of the iron coffin and indications that her hair was styled prior to burial. They were more than likely devastated by her passing, and they afforded her a noteworthy resting place that ensured utmost comfort even into death.

Burial 3

Little detail can be discussed regarding the individual interred in Burial 3 due to lack of significant skeletal indicators, coffin hardware, and material culture. Both sex and gender were indeterminate, and the size of the bones were neither gracile nor robust, further accentuating the difficulty of interpreting the life of this individual. Some arthritis appears on the bones, suggesting that they were at least somewhat active during their life, though not as much as the individual in Burial 1. Using stature estimation, Burial 3 may have been female. Middle-class females during the early- and mid-nineteenth century typically devoted time to taking care of their families by cooking, cleaning, and tending to children, which were typically numerous in families (Curtis n.d.). Despite that few remains were able to be analyzed, the dentition and general lack of pathologies suggest they presumably had a satisfactory diet throughout their life. Although more personal information cannot be obtained from the mortuary context, their family possessed sufficient wealth to be able to bury them within a grave vault.

Discussion

When excavation initially started, we were unsure of the socioeconomic class the individuals interred in the vault belonged to; we initially assumed they were of a somewhat lower class since they had not been placed in a mausoleum. However, osteological and material culture exemplify that they belonged to the middle class of New Orleans. They had enough wealth to afford a highly decorative wooden casket and an iron coffin, illustrated by Burials 1 and 2.

The dentition and stature of Burial 1 also illustrates that this individual's health status was relatively good during childhood; his height suggests that he probably had

access to adequate nutrition during childhood (Meadows and Jantz 1995). Dentition of Burial 3 suggests they did not experience significant health disruptions in childhood. If the individual in Burial 3 was female, her height is also reflective of adequate nutrition (Meadows and Jantz 1995). On the other hand, Burial 2 exemplifies significant health disruptions during childhood that likely contributed to her early death, as indicated by the multiple hypoplasias present on her teeth. Children were incredibly susceptible to disease in the era of industrialization, and even middle-class children sometimes could not escape death brought on by these diseases (Condran and Lentzner 2004, Curtis et al. 2007, Preston and Haines 1991).

Middle-class status is also reflected in the dentition of Burials 1 and 2. Because they both present caries, they had access to foods rich in carbohydrates and sweets, which was typical and even desired during the time. However, the fact that both Burials 1 and 3 were of average height suggests that their diets also had sufficient levels of protein available.

Activity markers in Burials 1 and 3 are another indicator of class and health status. Burial 1 possesses robust skeletal markers, and when combined with signs of arthritis, these indicators are evidence that he may have been conscious of his health status. The most prominent signs of arthritis are indicated on this individual's proximal ulnae and phalanges of the feet, suggesting that he may have exerted strenuous effort with his upper body and he could have been on his feet quite often for extended periods of time. Burial 3 also possesses moderate lipping on both proximal ulnae, though weathering does present issues when trying to estimate exactly how active this individual may have been.

None of the individuals appear to have lived especially long lives. While succumbing to death via disease is dependent upon socioeconomic status, nutritional availability, and access to medical care, it was difficult for inhabitants in New Orleans of any class to escape the treacherous illnesses which took the lives of so many. Yellow fever, diarrheal disease, and respiratory infections like tuberculosis did not discriminate on who they would infect, resulting in a devastatingly early loss of life.

While there were no archival records nor information in the cemetery to discern who these individuals were, they give us insight into unique life ways residents of New Orleans experienced. Combined osteological and material culture analysis provided a glimpse into life of the middle-class, a population that tends to be not as heavily discussed as lower- and upper-class members of society. Bioarchaeological research is a necessity when it comes to narrowing down the historical lens and placing individuals into their lived experiences of time and place. Osteobiographies use interdisciplinary research to paint the most colorful pictures of lives possible, and I believe I have engaged in a personal, in-depth conversation with these individuals that has accomplished that goal.

CHAPTER V: CONCLUSION

The goal of this study was to investigate and reconstruct the lived experiences of the three individuals interred in Cypress Grove Cemetery in New Orleans. Osteobiographies of these three burials combined osteological and mortuary analysis of material culture to construct the most complete reconstruction of their lives possible. These individuals were alive when the city endured exponential social and economic change during the nineteenth century that dramatically impacted the lives of the city's inhabitants. The three burials presented differing degrees of skeletal preservation which affected the amount of detail possible in their individual profiles. Material culture was preserved fairly well. Using all of this information, I was able to provide a glimpse into what the world was like for these individuals by combining what we already know from broader historical information with their life information revealed through their bones.

The grave vault excavated at Cypress Grove held three sets of remains: a White, middle-aged male who appears to have been relatively active throughout his life; a young adolescent girl who likely passed from an infectious disease and showed evidence of previous health disruptions in her life; and middle-aged adult who was probably female. Material culture and coffin hardware contained in the grave vault is reflective of what was typically used during the time and suggests that their families were of somewhat moderate means. The presence of items pertaining to apparel is suggestive that these individuals were styled and dressed nicely prior to burial, indicative of great consideration and thought being placed into their burials. Although the identities of these individuals are not known, their distinct and idiosyncratic stories are worthy of being told.

Limitations

While much information was gained from this study, it does present some limitations. DNA and isotopic analyses are usually included in osteobiographies. Isotopic analysis can reveal what their diet consisted of and can also date remains depending on the isotope used for testing; genetic information can suggest sex, ancestry, and a variety of other biological indicators. However, these analyses were not conducted in this study for a few reasons. Both are extremely expensive, and results from DNA analysis typically take an extended period of time to be returned. A sample of DNA is also required from a living relative of the deceased, and we were unsure where to obtain this sample of DNA due to the identities of these individuals being unknown. Most importantly, however, these forms of analysis are destructive. The remains excavated from this grave vault are to be reinterred at a later date, so any evaluation that harmed the remains was avoided.

Future Research

This research project has given a number of other students at the University of Southern Mississippi access to similar opportunities to produce comprehensive osteobiographies of other individuals from Cypress Grove cemetery. Many are from earlier time periods than those analyzed in this study, and they also include more children of a variety of ages. When all are combined, they will provide insight into cultural practices across the entire demographic spectrum across the second half of the nineteenth century in New Orleans

Of particular interest, there are not many studies and osteobiographies conducted of those buried in iron coffins. Further research into these atypical interments could reveal more reasoning behind why individuals were buried in them. Because of the

elevated price of these coffins compared to wooden caskets, they were largely only available to families who were financially well-off. However, it would be interesting to research if lower-class individuals ever used iron coffins to inter their dead. These coffins also allow for much better preservation of remains, so future research surrounding iron coffins could add significant information to the historical record that further details how identity was intertwined in a given time and place.

Although the sample size of this study was small, we are able to glean glimpses about what life may have been like for nineteenth-century residents of New Orleans. For individuals whose roots go back to New Orleans many generations, studies such as this one reveal lived experiences of their ancestors and what burial practices looked like for them during this time. Additionally, this study offers a point of reference not only for future studies centered around New Orleans, but also around the South and the United States broadly. More in-depth conversations can be had with the deceased, and through these personal conversations, they can reveal to us previously unrecorded information about the past.

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