

2010

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### Recommended Citation

Werner, William and Novak, Shannon A. (2010) "Archaeologies of Disease and Public Order in Nineteenth-Century New York: The View from Spring and Varick," *Northeast Historical Archaeology*: Vol. 39 39, Article 6.  
<https://doi.org/10.22191/neha/vol39/iss1/6> Available at: <http://orb.binghamton.edu/neha/vol39/iss1/6>

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## Archaeologies of Disease and Public Order in Nineteenth-Century New York: The View from Spring and Varick

William Werner and Shannon A. Novak

*The authors situate evidence of disease among the burial population of the Spring Street Presbyterian Church within evolving attitudes towards public health and civic order in 19th-century Manhattan. Two personal vignettes illustrate how individuals interacted with the physical space of the church's vicinity at different moments in the history of municipal reform. The first, a 16-year-old girl named Louisa, was virtually absent from the historical record until the recovery and analysis of her skeletal remains from the church burial vaults. Her skeletal biography conveys the cosmopolitan nature of Manhattan social relations in the early 19th century and the complex ways that they interacted with contemporary debates on disease and moral improvement. The second individual, the author of a Harper's Magazine article set at a fire watchtower across the street from the church, experiences a transformed infrastructure of the city by the last quarter of the 19th century. This writer's impressions reflect coalescing middle-class attitudes towards civic order and their manifestation in the physical framework of the city. This public discourse emerged from a half-century of catastrophes in public health and security often pinned on distinct socioeconomic segments of the urban populace. Contrasting these two individuals' experiences of life at Spring and Varick streets thus helps outline the trajectory of civic governance over the course of the 19th century and fosters critical awareness of the power of social representation in the emergence of modern civic authority.*

*Selon les auteurs, les problèmes de santé des individus inhumés à la Spring Street Presbyterian Church sont attribuables aux changements d'attitudes du XIXe siècle face à la santé publique et à l'ordre civique à Manhattan. Deux cas précis illustrent comment les individus interagissaient avec l'espace physique autour de l'église à différents moments de l'histoire des réformes municipales. Le premier est celui de Louisa, une jeune fille de 16 ans dont l'existence était inconnue des registres historiques jusqu'à ce que ses restes soient découverts et analysés dans un caveau de l'église. Sa biographie osseuse traduit bien la nature cosmopolite des relations sociales à Manhattan au début du XIXe siècle, ainsi que la complexité de l'interaction avec les débats contemporains sur les maladies et la moralité. La deuxième personne, l'auteur d'un article du Harper's Magazine qui se déroule dans une tour de guet d'incendies en face de l'église, vit les transformations dans l'infrastructure de la ville durant le dernier quart du XIXe siècle. Les impressions de cet auteur reflètent la coalescence d'attitudes distinctes envers l'ordre civique et sa manifestation dans le cadre physique de la ville. Ce discours public a été engendré après un demi-siècle de catastrophes en santé et sécurité publique; problèmes qui ont souvent été relégués à des secteurs socio-économiques spécifiques dans la population urbaine. En comparant ces deux expériences individuelles au coin de Spring et Varick, il est possible d'exposer la trajectoire de l'administration municipale au cours du XIXe siècle, favorisant ainsi la conscience critique du pouvoir de la représentation sociale dans l'émergence d'une autorité civile moderne.*

### Introduction

The Spring Street Church sits near the intersection of Spring and Varick streets, a corner for which the most illustrious historical event was perhaps the 1834 anti-abolitionist riot that rampaged through the block as it targeted the church and its nearby sister congregation. The *Journal of Commerce* reported on July 12 that:

the mob proceeded to Spring street and attacked Rev. Mr. Ludlow's church, the doors and windows of which they began to batter in. ... They then recommenced the work of destruction, broke in the doors, shattered the

windows to atoms, and entered the Church. In a short time they broke up the interior of it, destroying whatever they could. *Journal of Commerce* (July 12, 1834: 2)

This riot largely defines the Spring Street Church's place in the historical narrative of New York City, but it was just one of a series of upheavals in public order in the first half of the 19th century that the church's congregation and its neighbors experienced as the city expanded and industrialized at a rapid rate. Whereas earlier generations had relied on moral order instilled from church pulpits to keep the city's peace, by the second half of the 19th century, the city's politicians and insurance

companies demanded stricter surveillance to protect citizen lives and property, leading to the institutionalization of a police force, a fire department, and a health inspection agency. The reformed nature of urban space was clear at a fire house across the street from the Spring Street Church, where an iron watchtower from which a watchman maintained a panoramic view of the city streets was constructed in 1853.

This article examines how the material dimensions of reform unfolded in tandem with ideologies of health, class, and race at a single location: the corner of Spring and Varick streets. The recent excavation of the church's former location and the happenstance recovery of the skeletal remains of some 200 interments<sup>1</sup> in the church vaults provide unique insight into the living conditions for the Spring Street congregation between ca. 1820 and 1846.<sup>2</sup> In a few instances, the skeletal and historical data converge to enable more detailed portraits of individual members of the congregation, revealing the complexities of inferring individual life experiences from aggregate demographic data. What emerges is a more intimate familiarity with the generation that witnessed and experienced events leading up to the 1834 riot and which set the political foundations for the infrastructural and legal reforms that succeeded it.

### Toward a Corporeal Archaeology of the City

Our approach is microscalar: we consider the archaeology of Manhattan from the

<sup>1</sup> The skeletal counts for this series are not complete due to ongoing analysis of "disassociated" elements and those remains screened from the vault fill. During excavation, 62 discrete individual interments were identified (Mooney et al. 2008: 4.26). Laboratory analysis of these designated burials identified further commingling, and, when sorted, a total of 93 individuals were detailed in the final report (Crist et al. 2008: D.11). Since this time, elements that were designated as "disassociated" during excavation or were collected from fill soils have been sorted and analyzed. Analyses of these remains have added a substantial number of individuals to the counts of adults and subadults, but particularly to the latter (Crist, this volume; Ellis, this volume). It is estimated that when this analysis is complete, some 200 to 250 individuals will be accounted for in the vaults.

<sup>2</sup> The first report of the burial vaults occurs in 1820, and it is unclear whether burials occurred before this time. In 1832, following the cholera outbreak, the city government banned burial south of 14th Street, which is approximately 21 blocks north of Spring Street (Duffy 1978). Yet a coffin plate in the vaults dates to as late as 1846, suggesting the congregation was interring members beyond the ban (White and Mooney, this volume).

vantage point of a single street corner as experienced by two individuals, one accessed through skeletal analysis and the other from published accounts. We argue that this integration of skeletal, material, and textual evidence demonstrates archaeology's contribution to multidisciplinary efforts to introduce individual life experiences into historical and social scholarship. Such studies flesh out Foucault's (1977, 1978, 1991) analyses of how modern state authority derives both from techniques of population management and through the disciplined agency of its individual subjects.

Gandy (2006) contends that Foucault's emphasis on the role of bodies in discursive constructions of power precludes a full understanding of the mutually constitutive nature of state power and actual life experiences. He advocates engaging with the "body-city nexus"—the sites of corporeal interaction with the physical space of the modern city—to trace how discourses of the body, such as personal discipline and hygiene, lead to spatial differentiation of social groups and, consequently, to new forms of identity. As Gravlee (2009) demonstrates, disparities in the physical experience of space may generate biological consequences that become reified as social representation of race and class. The challenge is to maintain sight of how the outward biological characteristics that define social groups emerge *historically* as the outcome of the socio-political processes of the modern nation-state rather than explain them through the untenable concept of race.

This perspective is useful for exploring the relationship between health, disease, and civic authority over the course of the 19th century in New York City. Manhattan experienced rapid growth as its dockside neighborhoods became increasingly dense commercial centers and the city's wealthier elite moved to the northern outskirts of the city. A grid design was imposed on this urban expansion, and what was previously an undulating landscape of hills and swamps was, in a spirit of improvement, leveled and filled to conform to the grid pattern (Spann 1981: 101–106). Historians and archaeologists have scoured the archival and material traces of this process of expansion to map out the shifting contours of class, race, and ethnicity among the city's

inhabitants (Ward 1989; Rothschild 1990; Stott 1990; Sterzer 1992; Cantwell and Wall 2001: 188–202; Yamin 2001b). Where merchants and artisans once lived in close proximity, often under the same roof, the process of urban expansion led to greater separation in the living spaces of employers and employees and to a higher proportion of homes owned by absentee landlords (Blackmar 1988, 1989, 1995).

Following Gandy (2006: 252), such "power geometries" may be informative about past social relations, but merely mapping them reveals little about how they emerge. The physical boundaries of neighborhoods may be fixed on a map, but peoples' experience of these landscapes and their social divisions are more fluid. This is especially the case in transitional areas such the vicinity of Spring and Varick. Census research indicates that most of the Spring Street congregation members lived on nearby streets in the northern and western portions of the Eighth Ward (Meade 2008). While it was in close proximity to the developing middle-class neighborhood of Greenwich Village, which sanitary inspectors designated as particularly healthy, the Spring Street vicinity was also home to many working-class and artisan families (Spann 1981: 107–110; Blackmar 1995: 49–50). We demonstrate below how such a context, in which members of different social backgrounds lived and worked in close proximity, likely contributed to calls for greater social segregation to prevent the spread of contagions.

The emerging schisms in access to healthy living environments can be traced both through the archaeological study of particular homes and workplaces from an epidemiological perspective (Mrozowski et al. 1989; Beaudry 1993; Reinhard 1994; Mrozowski 2006) and through the interpretation of skeletal pathologies within evolving structures of race and class (Rose 1985, 1989; Rankin-Hill 1997; Higgins 2001a, 2001b; Phillips 2001). Many of these studies find that the health of stigmatized groups lagged behind that of the general population by the mid-19th century and the difference became increasingly acute by the end of the century. These studies attest to the importance of placing past lives within contemporary material and discursive contexts to trace the emergence of the prominent categories that structure social life today.

Biological anthropologists have effectively demonstrated that the distinctive traits of "race" as a biological phenomenon are not to be found in biometric measurements but, rather, in the divergent patterns in health and well-being between groups stigmatized by race as a *social* phenomenon (Rankin-Hill 1997: 163–174; Gravlee 2009). Notions associated with class identity share a similar lineage. The public image of moral and physical depravity in the city's poorest and most overcrowded neighborhoods fed into the discourses and practices through which middle-class respectability was constructed in opposition to working-class "slums" (Spann 1981: 148–149). Archaeological investigations into the material traces of actual behaviors associated with the rhetoric of temperance and the "cult of domesticity" have, nevertheless, failed to find unequivocal evidence that hygienic habits distinguished families by socioeconomic class. Even where access to sanitary technology was more limited, people of all social backgrounds sought to improve their living conditions, revealing the middle class's championship of the rhetoric of temperance and domesticity as discursively salient but factually deficient (Wurst 1991, 2002; Beaudry 1993; Reckner and Brighton 1999; De Cunzo 2001; Fitts 2001; Yamin 2001a).

These studies have built a strong argument in favor of deploying archaeology at the microscalar level to challenge inherited assumptions of urban life and its attendant social disparities. By extension, bioarchaeological analysis of skeletal remains enables further refining of the historical anthropological analysis to the scale of the individual. Below, we employ skeletal analysis to learn about the life of Louisa Hunter, asking how her experiences were shaped by the prevailing social discourses of the early 19th century at the same time that her own agency contributed to the further coalescence of municipal authority. Understanding the context of mid-to-late-19th-century urban reforms in both municipal infrastructure and domestic habits is necessary for a proper interpretation of biological remains from earlier periods, including that represented by the Spring Street burial population. It is clear that the disparities in health and material environment evident by the 20th century were not natural consequences of intrinsic human inequality but were rather

the accumulated result of historical processes that left distinct material traces in the archaeological and skeletal records.

### Health, Disease, and the Social Relations of Reform at Spring Street, 1810–1840

The Spring Street Presbyterian Church was established in 1811, near the corner of Spring and Varick in Manhattan's Eighth Ward, to accommodate the growing population of the northern reaches of the city (Moment 1886). At that time, the Eighth Ward was populated by merchants and artisans, indicating that much of the church's congregation was likely part of the city's nascent middle class (Sellers 1994). The same economic forces that fueled industrialization and wealth accumulation, however, also attracted a burgeoning population of poorer immigrants from the countryside of the U.S. as well as overseas. Census data indicate that these newcomers settled alongside more-established New Yorkers in the neighborhoods of the Eighth Ward (Meade 2008). This cosmopolitan social context likely contributed to the intellectual persuasions of the church's leadership, who were members of a breakaway sect of Presbyterianism—the radical New School Third Presbytery Synod—best known for its moral opposition to slavery as evil and an intrusion on the expression of individual free will (Wyatt-Brown 1969: 81; Moment 1886: 12–13).

### The Spring Street Burial Population

This social context assists the interpretation of disease among the burial population recovered from Spring Street. The Spring Street Church buried some 200 individuals in four burial vaults between the church's establishment in 1811 and the cessation of burials in the 1840s. Construction activities in early 2007 brought their remains to light (Mooney et al. 2008). Ongoing bioarchaeological analysis of these individuals provides unique insight into the epidemiological context in which the congregation members lived and the impact that disease may have had in the development of the church's intellectual and social ideals (Ellis, this volume; Novak and Willoughby, this volume).<sup>3</sup>

<sup>3</sup> Element and pathology frequencies have yet to be determined for the entire collection, as analysis continues on the commingled remains. Thus, only qualitative impressions of the population as a whole can be presented at this time.

The majority of the adults buried at Spring Street exhibited only limited skeletal evidence of chronic infections, especially when compared to the subadults in the sample (Ellis, this volume). Indeed, the afflictions of the growing bodies of children and adolescents, such as the case study of Louisa Hunter that will be presented below, may provide better evidence of urban ills. Additionally, there are some adults that exhibit clear skeletal effects of diseases such as tuberculosis and syphilis. To assess how the presence of diseased individuals may have been perceived by their fellow congregants, some aspects of the etiological thought that prevailed in the early 19th century must first be considered.

Prior to the advent of bacteriology—the understanding that infectious disease was caused by microscopic organisms—the prevailing “miasma” theory of disease recognized the deleterious effects of air and water pollutants but did not necessarily recognize that disease could spread directly from one person to another (Rosenberg 1978b: 55–59; Tesh 1995). Furthermore, medical treatment in the early 19th century was viewed primarily as an individual and domestic matter, and physicians were often considered ineffective or fraudulent (Duffy 1978; Rosenberg 1978a, 1978b). Apothecaries and dispensaries of bottled medicines were the primary sources of medical information, but, as archaeologists have shown, even by the 20th century, many of these products failed to contain any active ingredients of medicinal value (Torbenon et al. 2000; Bonasera and Raymer 2001). Poverty and disease were recognized as interconnected problems, but many of the public institutions charged with providing charitable healthcare, such as hospitals, asylums, and infirmaries, were still in their nascence prior to the 1830s.

The effects of endemic illnesses, such as tuberculosis, along with periodic outbreaks of yellow fever and cholera, were exacerbated by an array of social and environmental conditions, including poor air quality, nutritional deficiencies, poor hygiene, and climate. Structural changes in the workplace and at home also impacted the rate of infection at this time, especially the establishment of overcrowded sweatshops and tenements (Roberts 2012).



Figure 1. Periostitis on the visceral surfaces of the ribs of a female aged 25–29 (Vault 2 Burial 8), an indicator of pulmonary tuberculosis. (Photograph by Dana Kollman.)

Robust muscle attachments and trauma to the vertebrae indicate that some of the congregation members were laborers.<sup>4</sup> These individuals may have been subjected to yellow-fever-ridden dockside workplaces on a daily basis, and those of lesser financial means may have experienced overcrowding at home. While tenement buildings are often associated with the “slum” areas at the Five Points and in the Lower East Side, these buildings were interspersed throughout the city. Many of the middle-class dwellings near Spring Street were subdivided into tenement houses, housing numbers of families that were multiple of that for which they had been intended (Blackmar 1995: 49–50).

The effects of these structural conditions can be seen on some of the individuals buried at the Spring Street Church. At least four individuals exhibit lesions on the visceral surfaces of the ribs (FIG. 1). This condition most frequently occurs in individuals infected with

<sup>4</sup> Among the males and females in the skeletal population, there appears to be a series of individuals who are very gracile and lack robust muscle attachments and another group that appears to be particularly active and exhibit skeletal markers of habitual and strenuous activities. In the latter, the humeri have pronounced deltoids and anterior bowing of the distal shaft, along with pronounced muscle attachments in the lower arms and palmar ridging of the phalanges. Numerous enthesophytes appear across the axial skeleton, especially in the bones of the arms, pelvis, legs, and feet. Vertebrae also exhibit asymmetrical osteophytes buffering stress on one side of the body, and Schmorl's nodes are seen in the vertebral bodies. For a discussion of activity markers, see Jurmain et al. (2012).

pulmonary tuberculosis (Kelley and Micozzi 1984; Roberts, Lucy, and Manchester 1994). Other manifestations of bone changes in the Spring Street series, potentially associated with tuberculosis, include destructive lesions of the lower thoracic and lumbar spinal bodies (Pott's disease), septic arthritis of the hip, and endocranial lesions (*serpens endocrania symmetrica*).<sup>5</sup> (Resnick and Niwayama 1995; Roberts 2012). Such findings are not surprising, given that one of five deaths in the United States in the first half of the 19th century was attributed to “consumption” (Rothman 1995: 13–15).

While the structural conditions that favored the airborne contagions that likely affected many in the Spring Street congregation can be identified, the contemporary discourse on disease focused rather on the health effects of immoral conduct and a lack of personal discipline (Griscom 1854: 151–153). In this regard, evidence of syphilis among the church's congregation would have been seen as a salient reminder of the corporeal consequences of moral depravity rather than a consequence of less-than-ideal living and working conditions. Among the Spring Street burial population, at least four adults exhibit evidence of venereal syphilis in the form of “saber shin,” an inflammation of the anterior crest of the tibiae (Ortner 2003; Powell and Cook, 2005). Congenital syphilis is also evident

<sup>5</sup> Because analysis is ongoing, exact counts and frequencies of these conditions are not yet available.

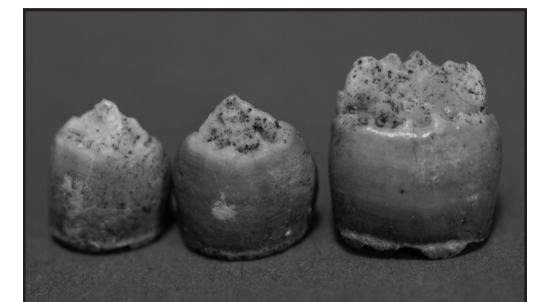


Figure 2. Dental stigmata from the commingled remains evidencing congenital syphilis. (Photograph by Dana Kollman.)

Table 1. Effect of epidemic diseases on mortality in New York City, 1822–1835

| Year | Epidemic disease | Number of deaths from disease | Percentage of excess deaths from disease |
|------|------------------|-------------------------------|--|
| 1822 | Yellow fever     | 166                           | 5.8%                                     |
| 1824 | Smallpox         | 394                           | 10.7%                                    |
| 1832 | Cholera          | 3,513                         | 54.4%                                    |
| 1834 | Cholera          | 971                           | 12.7%                                    |
| 1834 | Smallpox         | 233                           | 2.8%                                     |
| 1835 | Smallpox         | 351                           | 5.7%                                     |

Source: Excerpted from Condran (1995: Table 1, 31)

in the congregation in several instances of “mulberry molars,” which refers to an unusually small, dome-shaped first molar with a rough occlusal surface and “small protuberances that represent atrophic cusps” (Aufderheide and Rodriguez-Martin 1998: 166). At least one young male displays this dental trait, as do a number of other teeth that are commingled and cannot be linked to a specific individual (FIG. 2).

Nonetheless, if disease were a frequent experience among the church’s members, it left relatively few lesions in the adult skeletons. This is curious given the prominent discussion of the unhealthy nature of urban life during this time period. Condran (1995: 28) points out that endemic diseases were so omnipresent that they were often accepted as natural, unavoidable facts of life. Yet it must be remembered that lack of skeletal lesions does not necessarily indicate lack of affliction.<sup>6</sup> Because acute conditions move through the body’s system more rapidly than those that are chronic, these afflictions are more likely to kill an individual before leaving traces in the skeleton. As such, it must be considered that a likely cause of death for many of these individuals was the string of epidemics that struck the city in the early 19th century.

Several epidemics gripped the city between 1822 and 1835, encompassing roughly half the period represented by the

<sup>6</sup> The so-called “Osteological Paradox” has been a source of debate for two decades now (Wood et al. 1992; Wright and Yoder 2003). The problem is that samples of archaeological skeletons are not necessarily the same as samples of the living, because the most vulnerable in a population are the most likely to be represented among the dead. Thus the frequency of skeletal lesions, Wood et al. (1992) argue, cannot be used to extrapolate to the frequency of disease in the general populations.

Spring Street burial vaults (TAB. 1). Mortality rates in New York City in the 1820s and 1830s fluctuated between about 23 and 30 deaths per 1,000 inhabitants, with much higher rates during epidemic years (Condran 1995: 28–32). Thus, it is not surprising that disease featured prominently in contemporary discourse on a range of social matters; Rosenberg (1987: 1–5) argues that the terror inspired by the massive, global cholera outbreak of 1832 set in motion a half-century of social change that fundamentally altered Americans’ views on the proper role of civic authority in governing daily social life. Yet, even by the 1850s much of the public continued to hold physicians in low esteem (Rosenberg 1987: 154). Given the ambivalent attitudes towards doctors, medicine, and sanitation that prevailed during the lifetimes of the individuals buried at Spring Street, their contemporaries continued to locate the key to health in moral, rather than environmental, well-being. The members of the burial population, whether healthy or sick, would have been viewed by their fellow congregants either as healthy testaments to the healing power of faith and morality or as diseased exemplars of the dangers of moral waywardness.

Historical evidence supports the contention that the Spring Street Presbyterian Church may be understood as one locus where this discourse was inculcated into the city’s inhabitants. As noted above, the Spring Street Church was a member of the radical New School Third Presbytery Synod that centered its thinking on the preservation of free will. Many connected with this faction were part of other reform movements that emphasized purity of the body (Abzug 1994). Such purity, according to the Rev. Henry G. Ludlow, was responsible for the preservation of his congregation during the 1832 cholera outbreak. In a letter to his mother, dated October 8, 1832, Ludlow writes:

The Church of Christ in the midst of us has scarcely been touched—Very few useful lives have been taken. I have lost but two of my members, as far as I can learn and my congregation hardly

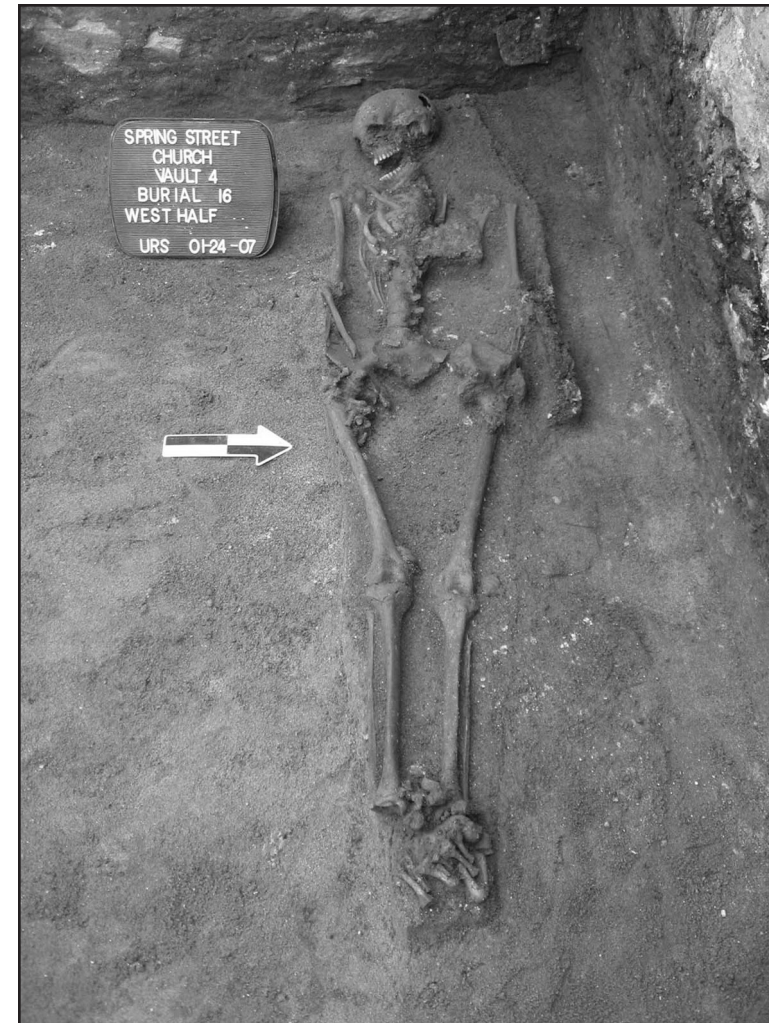


Figure 3. Louisa Hunter (age 16) in situ. (Photograph by Drew Oberholtzer, URS Corporation.)

shows one missing. This has been the case with all the church as far as I have learned. God has taught the world a lesson in fever of piety—and temperance—we have never had before. (Ludlow 1832)

#### The Discursive Impact of Disease: The Case of Louisa

A decade earlier, in 1823, the Rev. Samuel Cox delivered a speech at the Spring Street Presbyterian Church celebrating the recent establishment of a Sunday school in his congregation. The church was packed with 3,000 people, reportedly, including 800 children.

According to the unnamed author of an 1824 account published in the newly founded *American Sunday School Teachers' Magazine and Journal of Education*, there were a total of 275 pupils and 27 teachers at two Sunday schools attended by the church’s congregation, one held in the lecture room of the Spring Street Church and the other in a schoolhouse a block away on Dominick Street (*American Sunday School Teachers' 1824b*: 22–23). In the speech, Cox contended that the value of Sunday school to society was akin to that of disease prevention, and he called for vigor on behalf of parents and teachers to inculcate their youth with moral and patriotic values to secure the future, noting that the “sublimest attainments of the healing art ... are those which are *preventative* rather than *curative*; and the laws which erect goals to *punish*, are not to be compared to those

which erect schools to prevent human delinquency [emphasis in original]” (*American Sunday School Teachers' 1824a*: 30).

These views were not confined to the Spring Street Church; Rev. Cox’s sentiments closely resemble remarks delivered in an 1822 address by John Griscom, professor of chemistry and natural philosophy, who in the coming decades would serve as a physician for the New York Dispensary and briefly fill the role of city inspector (Spann 1981: 141–143). Griscom introduced his 1822 speech with a congratulations on the “restoration of health to our City,” presumably a reference to the

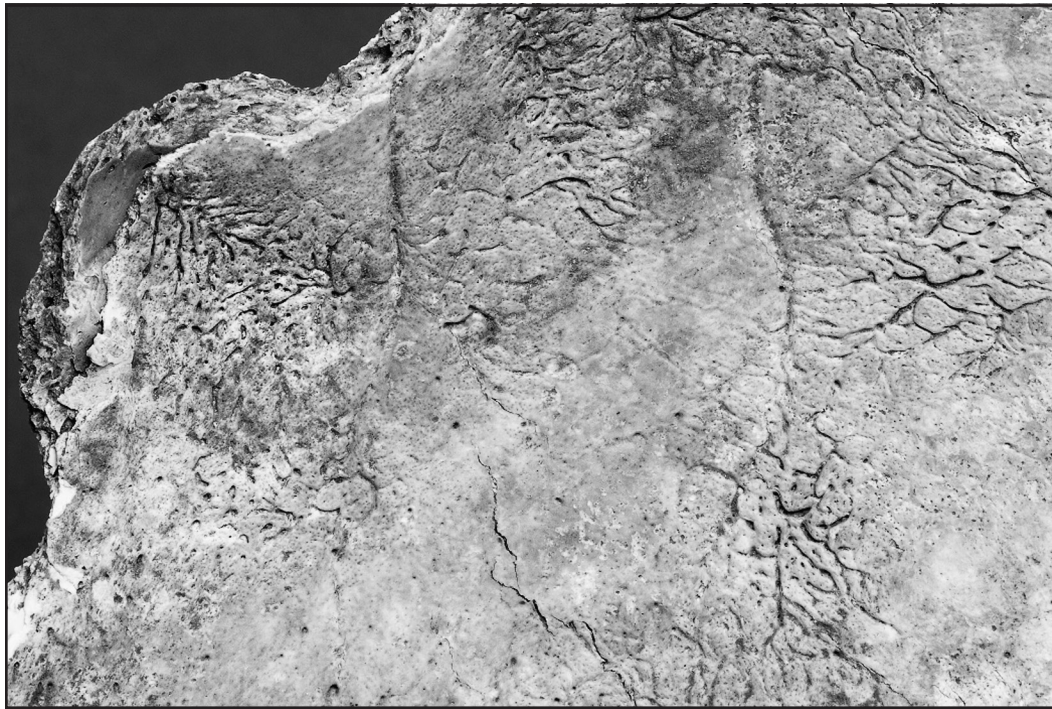


Figure 4. Serpens endocrania symmetrica on the interior of Louisa Hunter's cranium, indicating chronic infection of the meninges. (Photograph by Anthony Faulkner.)

1822 yellow-fever epidemic that struck New York (Griscom 1823: 2). He continues:

[h]ealth and its attendant train of enjoyments, are not to be separated from prudence and virtue. ... But if it be individually true, that soundness of mind is the best safeguard of soundness of body, it is emphatically so of men condensed into cities, and subject necessarily, to the same legal obligations. (Griscom 1823: 2)

With this segue Griscom, like Rev. Cox, moves on to enumerate the importance of education in securing the future of the United States.

The discursive connections made between health and education, or childhood well-being and public prosperity, call attention to the large subadult presence among the Spring Street Church's burial population (Ellis, this volume). Probably among the teenage children in attendance at Rev. Cox's 1823 address was Louisa Hunter, who died a few years later on February 1, 1825 at the age of 16 years and 7 months. Louisa's mortuary notice appeared in the *New York Weekly Commercial Advertiser* on February 4, 1825 and identified her father as John Hunter. The notice also describes her

death as the result of "a long and painful illness" (Mooney et al. 2008: 5.8). Through a combination of historical, archaeological, and skeletal evidence, Louisa is identified with Vault 4 Burial 16, depicted in Figure 3 (Crist, Novak, and Crist 2008; Mooney et al. 2008). (FIG. 3) Her skeleton was mostly intact, and the bones were generally in good condition except for some postmortem fracturing and erosion.<sup>7</sup>

Prior to identifying her through the historical record, the skeletal analysis of Louisa indicated that she was a probable female, based on the morphology of her pelvic bones and her overall gracile nature. Her stature was calculated to be around 5 ft. Her age was estimated as slightly younger than her recorded age, between 14.5 and 15.5, based on the development of her dentition and epiphyseal unions.<sup>8</sup>

<sup>7</sup> Missing from the skeleton was the left zygomatic, hyoid, coccyx, right talus and calcaneus, left radius and ulna, all left ribs, and the right 12th rib.

<sup>8</sup> Methods follow Buikstra and Ubelaker (1994). Dental calcification standards for age relied on Moorrees, Fanning, and Hunt (1963). Sex determination, though notoriously problematic for subadults, was estimated in this case due to the pronounced sexual dimorphism seen in this skeletal series, as well as pelvic and cranial morphology based on

This perhaps reflects delayed development as a result of her chronic illness.

Evidence of a chronic infection is most clearly apparent in Louisa's cranium and dentition. Like many of the subadults and some of the adults buried at Spring Street, Louisa's skeletal remains exhibits a "worm-eaten" appearance (*serpens endocrania symmetrica*) that roughly aligns with the meninges on the interior of her cranium (FIG. 4). Although these lesions are not diagnostic of a specific condition, they have been associated with chronic infectious diseases including syphilis and tuberculosis (Cook and Buikstra 1979; Hershkovitz et al. 2002; Lewis 2004). Also, Louisa exhibits a gray discoloration in her dental enamel, and her teeth are marked by prominent horizontal grooves, especially on the canines and incisors (FIG. 5). Known as linear enamel hypoplasia, these grooves indicate

adult standards. Stature was estimated from measurements of the left femur using the regression formula for white females (Jantz 1992). Maximum length of the left femur must, however, be considered a mere estimate because the epiphyses were unfused. The length of the femur used for this calculation included the diaphysis and articulated epiphyses.

childhood stress that disrupts the development of the enamel crowns (Goodman and Rose 1991). Such stress can be due to illness, malnutrition, or other developmental conditions, including those in utero (Armélagos et al. 2009). In Louisa's case, based on the mandibular incisor, it appears that chronic disruption began at approximately 2 years of age and systematically continued through complete crown formation at 4 years of age (Moorrees, Fanning, and Hunt 1963).

Lastly, Louisa's maxillary right central incisor exhibits an unusual deformation which may be the result of childhood trauma (FIG. 6). Known as dilaceration, this condition is characterized by an angulation or bend in the formed crown resulting from trauma to the deciduous predecessor (Topouzelis et al. 2010). Such trauma is more likely to affect the maxillary incisors because this area of the mouth is most likely to be impacted during a fall or other accidental injury. To summarize, Louisa's skeleton indicates that she was small for her age, experienced malnutrition in early childhood, had a chronic infection lasting until



Figure 5. Frontal view of Louisa Hunter's dentition, showing linear enamel hypoplasia on the incisors and canines resulting from chronic biological stress beginning around 2 years of age. (Photograph by Dana Kollman.)



Figure 6. Louisa Hunter's maxillary right incisor showing malformation of the crown as a result of childhood trauma. (Photograph by Dana Kollman.)

her death, and probably experienced a traumatic facial injury during early childhood. She would have appeared as a perpetually suffering individual among her peers in the Spring Street congregation and the surrounding neighborhood.

Louisa's poor-health status places her at the center of contemporary reform discourses at Spring Street and in the city more broadly. It has been seen above how these discussions centered on the nexus of health, education, and individual morality. Given the centrality of race relations to the Spring Street Church's place in the city's history, briefly considering evidence of Louisa's ancestry allows her to be further situated within the tense interplay between bodies, spaces, and social discourse in early Manhattan. The skeletal evidence of Louisa's ancestry is problematic, reflecting both the difficulty of discerning biological histories from the skeletal remains and the mutability of the race concept as a social phenomenon. The 1830 census identifies a John Hunter living on Hammersly Street in the Spring Street vicinity, which may be the same John Hunter family named as Louisa's father in her mortuary notice (see above). These census data indicate that Louisa was one of several children in a large, "free white" family (Meade 2008).<sup>9</sup>

<sup>9</sup> Censuses during this period were primarily concerned with properly apportioning representation between slave states and free states in Congress, and thus their questionnaires were limited to naming the head of household, the number of household occupants according to age group, and their respective statuses as "slave," "free black," or "free white" (Anderson 1990). Census data on John Hunter's family was not located for 1820, but in 1830, after Louisa's death, the rest of the household included two free white males (FWM) under the age of 5, one FWM between 5

However, Louisa's cranio-facial and dental morphology indicates a mix of traits that have been associated with European, African, and Asian populations (Gill 1998).<sup>10</sup>

The most parsimonious interpretation is that her ancestry was diverse, an unsurprising possibility given New York's status as North America's busiest port, commercial center, and immigrant destination. Whether Louisa was cognizant of such a heritage and whether she would have appeared as "mixed race" to her contemporaries is impossible

to glean from her skeleton alone. As Orser (2007) has cogently illustrated, race in 19th-century urban North America was determined not simply by physical traits but also took into account geographic location, socioeconomic status, nationality, language, and bodily habits such as dress and hygiene.

If indeed Louisa were of a more cosmopolitan ancestry than the term "white" typically implies, then she communicates an important message regarding the articulation of the race concept to evolving notions of social class, health, and civic order. In a social context in which poor Irish immigrants were considered as much of a threat to the racial composition of the U.S. populace as contemporary African Americans, health and wealth could have been the distinguishing criteria for racial membership, and phenotypic traits such as stature or facial morphology would have been on par with skin color in communicating racial status. Many of Louisa's contemporary neighbors believed that the mere presence of people of African ancestry was a virtual invitation for epidemic outbreaks of yellow fever and

and 10, one FWM between 10 and 15, one FWM between 30 and 40, one free white female (FWF) between 10 and 15, and one FWF between 20 and 30. Louisa would have been age 22 had she survived to 1830 (Meade 2008: D7).

<sup>10</sup> These traits, which have been used to classify race, are based on statistical probability and not absolute certainty, thus providing little, if any, interpretive value. In the case of Louisa, her dental arcade, maxillae, and palate display morphological characteristics that appear more frequently in African or Asian populations, while the size of her nasal aperture and the Carabelli's cusp on her maxillary left first molar are more frequently observed in those with European ancestry. DNA analysis is currently underway, which is hoped will provide a better understanding of her biological history, as well as that of others in the burial vaults.

cholera, but such ascriptions could also be applied to poor immigrants who might otherwise appear "white" (Rosenberg 1987: 59–62; Linn 2008).

Gandy's (2006) contention that 19th-century concepts of the body and the contemporary evolution of urban space were concomitant, recursive phenomena—the "body-city nexus"—is crucial here: associations between race and disease did not consist solely of rhetoric and slander, but were substantiated by concrete perceptions of suffering individuals in the city's public spaces. By identifying individuals such as Louisa and her fellow congregants and tracing their experiences of the city through skeletal, archaeological, and historical evidence, how their experiences of the city not only contributed to their health statuses but also to the continued growth of the city itself is fleshed out. We argue below that, as members of a congregation under public scrutiny for its anti-abolitionist rhetoric and desegregationist practices, the life experiences of Louisa and her fellow congregants had material consequences for the reformation of the city's infrastructure decades after their deaths.

### Race Riots and Reform in the 1830s

The prevalence and status-crossing nature of disease incited public support for major city reforms in public health practices, sanitation, and municipal infrastructure. These factors were also the source of a great deal of social tension. In addition to sickness, poverty and social unrest were also perceived as contagions, which only the proper segregation of races and classes could mitigate (Gilje 1987: 158–162; Blackmar 1989: 175). These tensions manifested as a riot in the Eighth Ward on April 5, 1825, when a mixed-race mob protested the city's regulation of hog keeping by attacking the driver of a hog-catching cart. City officials increasingly linked the keeping of animals to the conditions that favored the spread of disease, but, because such practices were important to the livelihoods of people of lesser means, the resulting "nuisance laws" became an early example of how sanitary measures, as an expression of civic authority, became entwined with ideologies of race and class (Gilje 1987: 224–232; Blackmar 1995: 42–48).

The Eighth Ward was again the scene of violence when the Spring Street Church was the epicenter of the race riots that gripped the city in 1834. Due to their abolitionist stance and desegregationist policies, the Spring Street Church, its sister congregation on Laight Street, and the homes of the church leaders were principal targets during these riots (Burrows and Wallace 1999: 556–559). The buildings were ransacked, and their furniture was lit aflame and strewn into the streets. At its peak the mob reportedly numbered in the thousands, breaking into factions as the city engaged in a nearly unprecedented mobilization of militia, police, and firefighters to quell the destruction.

Gilje (1987: 162–167) emphasizes the economic factors that promoted racial strife, arguing that, as more blacks evaded slavery and participated freely in society, recent immigrants and other working-class whites feared their loss of job security and the increased competition for jobs. The historical data he presents confirms that among the rioters were many young men, with unskilled or semi-skilled occupations, living in the immediate vicinity of Spring and Varick streets. It is clear from contemporary accounts, however, that, regardless of the structural roots of the conflict, it was the sight of black bodies in "white" spaces and the perception of miscegenation that incited the riots.

The events immediately leading up to the riots began on July 7, 1834 at a chapel on Chatham Street, when the New York Sacred Music Society arrived for its meeting to find that the space had simultaneously been leased "by a large congregation of blacks of both sexes." The *Niles Weekly Register* reported that the musical society decided that, finding "themselves excluded from their own leased premises, by the blacks who had assembled and filled the church, it was deemed advisable, to inform the blacks that they had no right to remain." An argument ensued that escalated into violence, and the melee soon spilled out of the chapel and into the street. Anxieties rose with the spread of news about the incident, especially since a meeting of abolitionists was due to be held at the same chapel a few nights later, prompting one commenter to note that:

We have long been of the opinion, and frequently expressed it, that the abolitionists are *the worst enemies* the blacks of this city have ... holding out to them the prospect of amalgamation, feeding their pride with impracticable hopes ... inviting them to sit with the whites indiscriminately [emphasis in the original]. (*Niles Weekly Register* July 19, 1834: 357)

Outward signs of ill health among the black congregants would have further magnified the perceived threats of shared space (Rosenberg 1987: 59–62). The ensuing mob violence can be read as an early manifestation of the race riots that would become increasingly common over the next century, but this limited interpretation does little to explain how conflict associated with ideologies of race and class actually emerges from the concreteness of quotidian life in the city. Contextualizing the 1834 anti-abolitionist riots as a coda to the biographies of the congregants represented in the Spring Street cemetery, the first generation of the church's abolitionist members, provides a richer understanding of how the lived experiences of these individuals helped to produce the social and material motivations for reform.

### Social and Material Dimensions of Reform

The year 1834 may have brought successive epidemics of cholera, smallpox, and mob violence, but a massive 1835 fire brought the worst conflagration yet suffered by the expanding city (Burrows and Wallace 1999: 596–598). The death, destruction, and chaos witnessed by New Yorkers in the early 19th century was enough to overturn the founding notions of the United States as a society built on individualism and limited civic authority. As the city's population continued to grow and its mortality rates broke new records, the citizens of the country's most populous port were eager for the municipal government to extend its authority to protect personal safety through an increased presence in the domains of public health, fire prevention, and police surveillance.

In this section, how the implementation of these reforms solidified a class ideology that was reproduced in the material landscape is considered. Two concrete manifestations of the reform movements at Spring and Varick were the introduction of a plumbing system and the construction of an iron fire watchtower. Both

improvements represented technologies that would become increasingly fixed into the urban landscape, and both served as material referents for coalescing discourses of class, race, and identity among the city's inhabitants. As preventative measures taken to protect citizens' lives and property, both were also linked to the maintenance of social discipline.

### Social Sanitization

The material reforms that enabled new expressions of city authority in preventing disease, fire, and social uprisings, as well as the attendant discourses of class that became obsessed with bounding portions of the city as problem zones inhabited by the filthy, destitute, and foreign are rooted underground with the construction of the Croton Aqueduct, one of the city's largest public works projects of the 19th century. The Metropolitan Board of Water was one of many municipal agencies that coalesced out of the crises of the early 1830s, and the aqueduct was its flagship project. The celebratory spirit surrounding the opening of the Croton's first 40 mi. of pipes in 1842 suggests that the middle-class urban populace welcomed the aqueduct as a manifestation of the city's increasing civic authority. Its high expense was financed by increased taxes, but citizens were eager to see it to completion for the litany of social ills it promised to solve: by introducing fresh drinking water, it would reduce alcohol consumption and moral disorder; by fueling a modern sewage system, it would increase sanitation and hygiene and curb disease; by making water readily available throughout the city, and it would foster public security by putting a quick end to the plague of fires. The water supply nourished the city's burgeoning population, commercial activity, and industrialization. It was thus closely intertwined with the trappings that defined "progress," from steam power to middle-class domesticity (Spann 1981; Burrows and Wallace 1999: 594–595, 625–628; Melosi 2000: 83–85).

In the case of disease prevention, Rosenberg (1987) argues that a sea change in public opinion regarding government regulation of domestic life was the key factor in largely averting a mass cholera outbreak in 1866; public attitudes regarding disease and medicine per se had actually changed very

little from their early 19th-century standards. Morality and discipline were still considered the best preventers of disease. What changed in the second half of the 19th century was the authority relinquished to the municipal government to encourage and enforce a disciplined citizenry. In some cases, this consolidation of municipal power can be shown to have been encouraged and preceded by citizens' groups acting independently. The 1865 *Report of the Council of Hygiene and Public Health*, for example, was authored by the Citizen's Association of New York (CANY) Council of Public Health, a group of the city's leading physicians and hygienists, including John Griscom. The group was entirely a volunteer association, and their report states that their sanitary inspections were undertaken without the resources of the municipal government. They also strongly indicate that their efforts were meant to instigate the city's legislators to continue their efforts, as well as their intent to make their findings available to the Metropolitan Police (CANY 1865: xvi–xvii, xxx, lxi–lxii).

The organization for the inspections began in the spring of 1864, when the entire city was divided into 29 sanitary districts. An inspector with knowledge of medical or sanitation practices was named to carry out the inspections for each district. The inspectors were instructed to note the terrain and natural drainage characteristics for the blocks they visited, the state of artificial drainage improvements, obvious signs of filth and disease, the "prevailing character" of the block's inhabitants, and the condition and use of each of the buildings. They were instructed to engage directly with the population by entering the buildings to record their interior details and by interviewing their inhabitants concerning rates of mortality and sickness (CANY 1865: xxi–xxv).

In justifying its endeavors to carry out sanitary inspections of the city's private spaces, the Citizen's Association asks its report readers to recall the chaos of the 1863 Draft Riots:

The mobs that held fearful sway in our city during the memorable outbreak of violence in the month of July, 1863, were gathered in the overcrowded and neglected quarters of the city. As was stated by a leading journalist at that time: "The high brick blocks and closely

packed houses where the mobs originated seemed to be literally *hives of sickness and vice*. It was wonderful to see, and difficult to believe, that so much misery, disease, and wretchedness can be huddled together and hidden by high walls, unvisited and unthought of, so near our own abodes" [emphasis in the original] (CANY 1865: xv).

Spring and Varick sat at the boundary of the Third District, Section B (Eighth Ward south of Spring Street) and Fifth District, Section A (Eighth Ward north of Spring Street). The inspectors of both sections noted an abundance of brothels, liquor stores, and overcrowded tenement houses in the area. The inspector of the Fifth District was particularly concerned about the blocks between West Houston, Charlton, Varick, and Greenwich streets (located just northwest of Spring and Varick). He found here a cluster of tenement houses which:

are universally unclean and offensive with the emanations from the decomposing refuse which surround and permeate the apartments of the poor. To the want of proper facilities for cleanliness are added the objectionable personal habits of the people themselves ... taking no concern for the general comfort and neatness of their apartments; sleeping and eating together in their ill-ventilated and crowded apartments; disposing of their slops and garbage so as to save themselves from personal exertion, as much as possible, with very few facilities to aid them. (CANY 1865: 67–68)

The Fourth District inspector similarly concludes that the

moral condition of many portions of this section of the city is lamentable; abounding with thieves, pickpockets, gamblers, and all sorts of bad men and women, who are ready to do any thing for money. The churches are few and small considering the dense population; a small proportion of the population is of the church-going class. The crowding of people into tenant-houses has a great tendency to moral as well as physical depravity in all portions of my inspection district. (CANY 1865: 38)

Such strict demarcation of "hives of sickness and vice" were less thinkable during previous generations; as discussed above, in the 1820s and 1830s people of differing social backgrounds and financial means more frequently mingled in a poorly differentiated social landscape. This cohabitation began to



change with the introduction of Croton water, which engendered further divergence in the living standards of the wealthy and the needy. Following the opening of the aqueduct, households had the option of installing indoor plumbing provided they could pay for the improvements, but landlords of tenement buildings delayed these upgrades for decades (Spann 1981: 117–120, 131–134; Blackmar 1995: 52–53). In the newly developed middle-class neighborhood on Sullivan Street at Washington Square, northeast of Spring and Varick, such improvements were immediately put into effect. Just a block away, however, in an artisan neighborhood inhabited largely by renters, landlords do not seem to have invested in upgrading sanitary measures until the 1870s (Howson 1994). Numerous archaeological studies have demonstrated that these emerging class disparities in access to sanitary living conditions were not unique to New York City but were shared with urban populations throughout the Northeast (Ford 1994; Rosenswig 1999: 43; Crane 2000; Mrozowski 2006: 86–88, 97–113).

With the availability of plumbing technology, sanitized homes and neighborhoods were increasingly seen by the middle classes as necessities rather than luxuries. At the same time, boardinghouses for the city's day laborers proliferated. While those with economic means could afford to buy daily tickets to ride the omnibus greater distances between their workplaces and their homes beyond the city's industrial core, working-class residential areas were restricted to living within walking distance of their industrial workplaces. The bifurcation of the housing market and the unequal distribution of sanitation technology between neighborhoods led to increasing health disparities between socioeconomic classes (Spann 1981: 144–149; Stott 1990: 191–193; Blackmar 1995: 49–54).

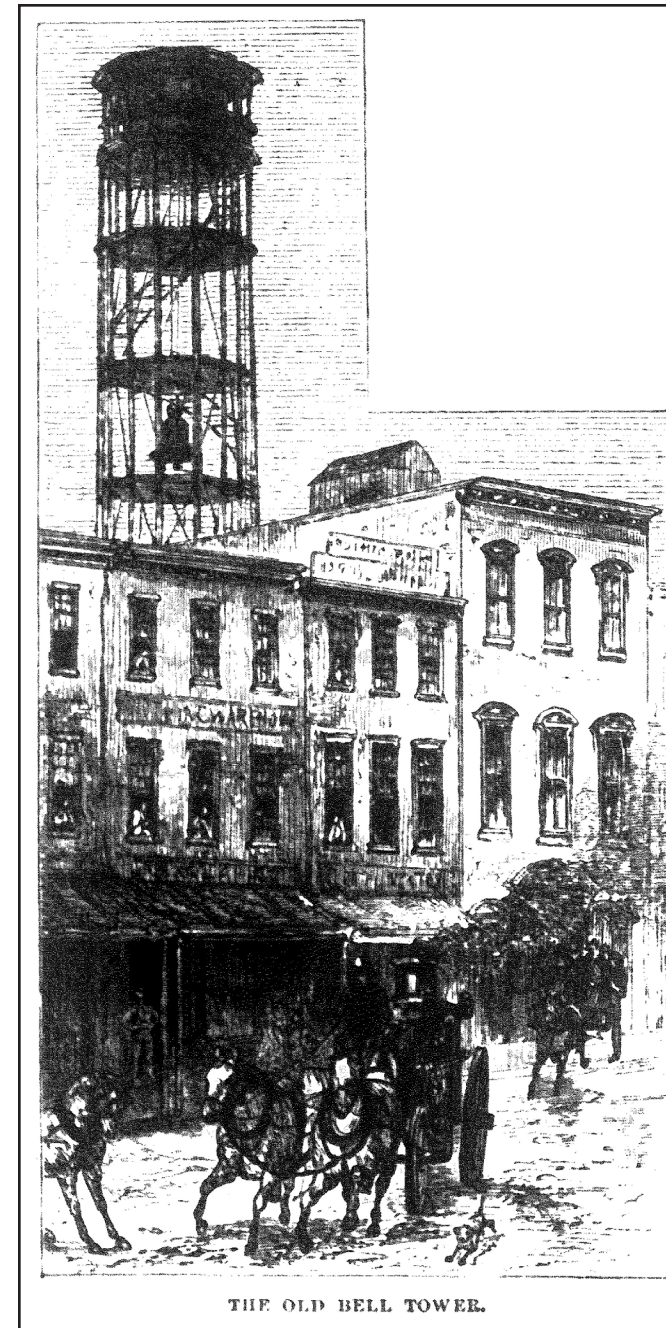
Croton water may have altered the corporeal experience of urban life for the city's inhabitants, but the trends discussed above demonstrate that the improvements were not uniformly distributed. Though it may have served as a material symbol in support of Progressive Era reform ideologies, it must also be understood as one mechanism by which social inequality was increasingly built into the physical structure of the city. It serves as a

concrete example of how, with the development of the concept of public health, "the human body has become progressively incorporated into a nexus of architectural and regulatory structures to produce a new spatial order in the modern city" (Gandy 2006: 503). The sanitary inspections carried out in 1864 exemplify the new power relationships that emerged from the discourse of public health, but what is especially significant for tracking the evolving body-city nexus is how the findings of these reports fed into coalescing ideologies of race and class that naturalized the poor living conditions of those deemed to be of inferior status, thereby ensuring their continued, disproportionate exposure to harmful environments (Gravlee 2009).

### Surveillance at Spring Street

Like the introduction of the Croton water system, the establishment of an improved system of modern iron fire watchtowers was an occasion for celebration in the city. In 1849 the Fire Department's chief engineer set about reforming the city's fire protection system in response to the fires that continued to plague the city even with the greater availability of water (Spann 1981: 154–155). He divided the city into eight districts, each of which was to have a fire watchtower that would command a view of its vicinity as well as that of neighboring districts. Earlier watchtowers had been constructed of wood, but in 1851 the Board of Aldermen approved plans to replace them with iron towers that would both be taller and more resistant to fire.

The first tower was erected at the northern outskirts of the city between 32nd and 33rd streets. Designed by James Bogardus, the tower was a major precursor to future construction technologies, falling somewhere between a lighthouse and a skyscraper in the developmental trajectory of modern urban architecture. Its architectural significance did not go unnoticed by contemporary observers, who applauded the towers in press announcements and woodcut images appearing in such publications as *Scientific American* (Gayle and Gayle 1998: 109–113). Shortly thereafter, the city approved construction for a second watchtower near the corner of Spring and Varick



THE OLD BELL TOWER.

Figure 7. Watchtower at Spring and Varick streets (Rideing 1877: 664). (Engraving attributed to Winslow Homer.)

that was erected in 1853. It followed the same design as the first, but at 125 ft. (38 m) it was even taller, commanding a greater view (Gayle and Gayle 1998: 120–122).

From their high vantage points, the watchtowers enabled a new type of view of the city as a unified, manageable entity. One former watchman recalled that "it was part of our business to learn the exact location of every conspicuous building, the church steeples, flagpoles and different sorts of lights which would serve as landmarks" (*Municipal Journal and Engineer* 1904: 184). The implications of this new form of observation extended beyond fire protection. By midcentury, what had once been a predominantly suburban and middle-class neighborhood around Spring and Varick was increasingly industrial, commercial, and stricken by crime (Sterzer 1992: 68–71, 156). Thus, while the Spring Street watchtower was erected in direct response to the threat of fire, it also equipped the city with a surveillance technology at the same time that its citizens were increasingly differentiated according to social background. Gilje (1987: 278) notes that throughout the 19th century the borders between fire surveillance and police surveillance were blurred, and the captain of a downtown engine house boasted: "In the riots of '63 the volunteer firemen did far more effective work than the police, I think, for not only did they labor hard to put out every fire that was started but afterward they turned to and licked the mobs—or tried to" (*Municipal Journal and Engineer* 1904: 185).

Whether the very presence of the Spring and Varick watchtower contributed to the city's response to these infamous 1863

Draft Riots is unknown, but it is worth noting that the vicinity does not seem to have been subjected to the major outbreaks of violence recorded by contemporary sources (Barnes 1863).

The watchtower was a materialization of city authority within a neighborhood that was increasingly depicted as problematic and in need of surveillance to prevent disorder. Whereas in the 1820s the leaders of the Spring Street Church took upon themselves the duty to improve the health of the members of the congregation by encouraging reformation of their personal habits, by the 1860s the city's civic leaders assumed a similar role by increasing an authoritative presence in the city's public streets and squares.

The effect was a restructured city that featured what Foucault (1977: 201) describes as the technologies of panopticism, which work:

so to arrange things that the surveillance is permanent in its effects, even if it is discontinuous in its action; that the perfection of power should tend to render its actual exercise unnecessary; that this architectural apparatus should be a machine for creating and sustaining a power relations independent of the person who exercises; in short, that the inmates should be caught up in a power situation of which they are themselves the bearers. (Foucault 1977: 201)

These technologies are classificatory; they categorize and draw up differences between people so as to create new subjectivities that are embodied by the people themselves (Foucault 1977: 203). By creating new physical architectures as well as regulatory apparatuses that tracked citizens' behaviors and movements between the city's public and private spaces, the city's various mid-19th-century infrastructural reforms created new power relationships and solidified new forms of social identity and inequality.

#### Views of a City Transformed: William Henry Rideing

High above the tenements, cesspools, and effluvia that shocked the sanitary inspectors, the journalist William Henry Rideing perched at the top of the Spring and Varick watchtower in 1877 to provide a much different perspective of Manhattan's social condition. Born the son of a

London steamship officer in 1856, Rideing's literary career took him across the Atlantic to document the feats of industrialization and westward expansion in the United States (Wilson and Fiske 1888: 249). Through his global mobility and exaltation of technological progress, Rideing shared in the intellectual interests of the middle-class readership of the popular magazines that published his articles.

Rideing was only a few years older than Louisa Hunter when he visited Spring and Varick in the mid-1870s to climb to the top of the station's watchtower (FIG. 7) and to document the lives of New York's professional firefighters housed at Station No. 30, directly across the street from the Spring Street Church (FIG. 8). Yet, while the historical and bioarchaeological analyses of Louisa's life reflects an experience of a city ridden with disease and social strife barely manageable by civic authorities, Rideing finds Spring and Varick to be an opportune vantage point from which to convey to his readers an orderly city safeguarded by a highly effective municipal infrastructure. We argue that his impressions are informed by the materiality of a city reconfigured by a generation of reform and by a Progressive Era, middle-class sensibility contingent on the continued surveillance of potential sources of conflagration.



Figure 8. Detail of Manhattan Ward 8 (G. W. Bromley & Co. 1879), showing the Spring Street Presbyterian Church and Engine Company No. 30. (Image courtesy of the David Rumsey Map Collection; detail modified by William Werner.)

Rideing's description of the firefighters is precisely the opposite of the characterizations that the sanitary inspectors made of the neighborhood's residents barely a decade earlier. He praises their personal discipline and work ethic: they eschew discussion of religion or politics; they are free of drink and vice; they leap from their neatly aligned beds with clockwork precision to battle the next great conflagration with pressure hoses powered by a steam boiler connected to pipes delivering Croton water. "Alarm or no alarm, the men are always ready and in habitual suspense. The constant watching and waiting take the edge off their capacity for surprise. They are as mechanically responsive to the stroke of the gong as the weight which releases the halters of the horses" (Rideing 1877: 663).

Rideing describes the watchman as removed from the urban activity below, yet closely attuned to its activity as he marks time by ringing the tower bell:

All the sorrows of the city below us seemed to take voice in the dying reverberations of that bell, and when the last audible hum had expired, the watchman seemed relieved, and was more disposed to talk, though he continued his perambulations of the room, occasionally bending forward and staring intently in some direction where a stronger flare than usual indicated the possibility of fire. (Rideing 1877: 664)

The timing of the tower bells was synchronized through telegraph wires, which also transmitted the alarm should a watchman spot a fire in the panoramic view through his spy-glass (Rideing 1877: 663–665). Rideing's account of his experience at Spring Street conveys an image of a city under the disciplined control of civic authorities. Through a synthesis of discipline, technology, and municipal infrastructure, they were prepared to respond not only to natural hazards but also to social discord. Rideing's account of the fire watchman high above the city, along with the sanitary inspector's reports from the ground below communicate strong sentiments that link social class with civil order: those too poor to move away from the overcrowded and filthy tenements were the harbingers of disease and social strife, while the professional classes who volunteered their service and discipline to the sanitary commissions and fire squads kept this disorder in check.

#### Conclusion

The lifespan of the watchtower was fairly short. Already by the time of the writing of Rideing's (1877) article, the surveillance utility of the tower was being replaced by a more extensive telegraph network, such that the ability to sound an alarm was not concentrated in a few towers but rather dispersed to virtually any point in the city. This telecommunications network would, of course, expand over the next century to enable the hypersurveillance technologies of the late 20th and early 21st centuries. If the construction of the tower symbolized a transfer of responsibility for civic order from private institutions, such as the church, to city authorities backed by standing regiments of police, firefighters, and health inspectors, the watchtower's disappearance into the shadows of skyscrapers marks a further dispersion of power to private commercial interests backed by the infrastructure of the state.

In densely storied Lower Manhattan, archaeology at a single street corner like Spring and Varick contributes a local history that reflects these national and global processes. The locally and federally mandated excavation and analysis of Louisa and her fellow congregants has brought new insight into how discourses of reform unfolded in the early 19th century in relation to individual lived experiences among the members of the Spring Street Church. While no such physical remains have been documented for Rideing's watchtower, a nearly identical tower remains preserved in Harlem's Marcus Garvey Park (New York City Department of Parks and Recreation 2012). Archaeological remains enjoy such federal, state, and municipal protection because their chance discovery frequently revises or refines our understanding of local history and culture. Inserting bioarchaeological data into the narrative of reform in 19th-century Manhattan advances a further goal of democratizing the historical record to include those who did not have a strong voice in the texts that form the basis of standard histories. By placing Louisa Hunter and William Rideing's biographical vignettes—one accessed through bones and the other through text—into historical dialogue, we have sought to explore the subtle social tensions that connect their narratives to each other and to our present world.

We have suggested that both of our subjects contributed to an evolving social discourse on public health and civic order, although Louisa Hunter may have done so unwittingly by her mere presence among socially conscious leaders, reformers, and rioters. Though William Rideing was no doubt oblivious to Louisa's burial beneath his feet when he made his own passage through Spring and Varick a half-century later, when he climbed the spiral staircase of the watchtower he nevertheless witnessed the material response to the civic disorder experienced by Louisa's congregation in the wake of the social reforms that she perhaps partially incited. Together, their stories illustrate how social discourse flows through bodies moving within the architecture of the city. The narrative that emerges from this synthesis of skeletal, archaeological, and historical evidence combats the notion that health, disease, social identity, living conditions, and social geographies are natural concomitants; whatever links that bind them emerge through historical processes that can be traced through historical and archaeological research.

### Acknowledgements

We would like to thank those who have contributed to this study, including Anthony Faulkner and Dana Kollmann for photography. Meredith Ellis generously shared her research on the Frey Family Papers in the New York State Historical Research Library in Cooperstown, New York. Thanks to Edward M. Morin for organizing the SHA panel from which this paper emerged, and the URS team, especially Tom Crist, who collaborated on the project. We express our gratitude to the Presbytery of New York City, particularly David Pultz and the advisory committee, who have supported and encouraged our ongoing research. Such research has been supported by a series of Appleby-Mosher Research Grants provided by the Maxwell School, Syracuse University. Finally, many thanks to the anonymous reviewers whose thoughtful critiques and comments vastly improved this paper.

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