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Douglas B. Mooney

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Lost within the Rubble: The Archaeological Findings from the Spring Street Presbyterian Church Burial Vaults

Douglas B. Mooney

Archaeological investigations of the former Spring Street Presbyterian Church property resulted in the discovery of four stone and brick subterranean congregational burial vaults. In active use for only about 25 years, these chambers were found to contain the remains of more than 200 individuals, including large numbers of children. Excavations revealed that remains had been impacted by both natural and manmade processes at various points in the past; however, a total of 46 discrete burials were identified during the excavations. Findings from these investigations provide much previously-unavailable information regarding the structure, internal organization, and preservation of remains within 19th-century funerary vaults.

Les recherches archéologiques effectuées sur la propriété de la Spring Street Presbytérien Church ont permis de découvrir quatre caveaux souterrains construits en pierres et en briques. Ces chambres funéraires, bien qu'utilisées pendant seulement 25 ans, contenaient les restes humains de plus de 200 fidèles, dont plusieurs enfants. Les fouilles ont révélé que les restes avaient été grandement perturbés dans le passé. Néanmoins, 46 ensembles de sépultures ont pu être identifiés. Les résultats de ces recherches fournissent plusieurs nouvelles informations concernant la structure, l'organisation interne et la préservation des restes humains dans les caveaux funéraires du XIXe siècle.

Introduction

This article discusses archaeological investigations of the former Spring Street Presbyterian Church property, located at 244–246 Spring Street, in the lower west side of Manhattan, New York City by AKRF, Inc. (AKRF) and URS Corporation (URS) (Mooney et al. 2008). These excavations involved the documentation of four early 19th-century burial vaults (ca. 1820–1846). These vaults are believed to be the first burial facilities of their kind in the northeastern part of the United States to be studied archaeologically. The excavations also documented the recovery and study of the human remains and artifacts contained within the vaults. Although the vaults had been impacted by both contemporary construction and mid-20th-century demolition activities, they did generate important baseline comparative data relating to the physical structure of 19th-century church vaults and the organization and maintenance of interments within these structures.

The Spring Street Church was an important religious organization in New York City during the first half of the 19th century. While its members were predominantly drawn from the poorer working classes of the city, the congregation was led by a series of socially-progressive leaders who early on established mixed-race worship services and played

leading roles in the abolitionist movement in the decades before the Civil War. The church was established in 1811 on a 100-ft. square plot of ground near the southeast corner of Spring and Varick Streets. Worship services were initially conducted in a simple frame structure measuring some 30 by 60 ft. in size. This first church building was damaged during the anti-abolition riots of 1834, and a larger, stone-and-brick edifice was constructed and remained standing until demolished and replaced by a parking lot in the mid-1960s (Meade 2008 and Meade, this volume).

As revealed in fragmentary church documents, the Spring Street Church had established its burial vaults for the reception of members of the congregation by at least 1820. These were subsequently enlarged by the addition of two more vaults in 1831 (Meade 2008). The construction of underground vaults, as opposed to the creation of a cemetery, may have had more to do with the congregation's lack of financial resources than any other factor. From the moment of its founding, the Spring Street Church was in debt, and, in the late 1820s, the congregation was reported to be comprised primarily of working-class individuals and families, "most of whom belong to that class of person who cannot afford to purchase or hire a pew in our city churches" (Ludlow 1828, quoted in Meade 2008). The

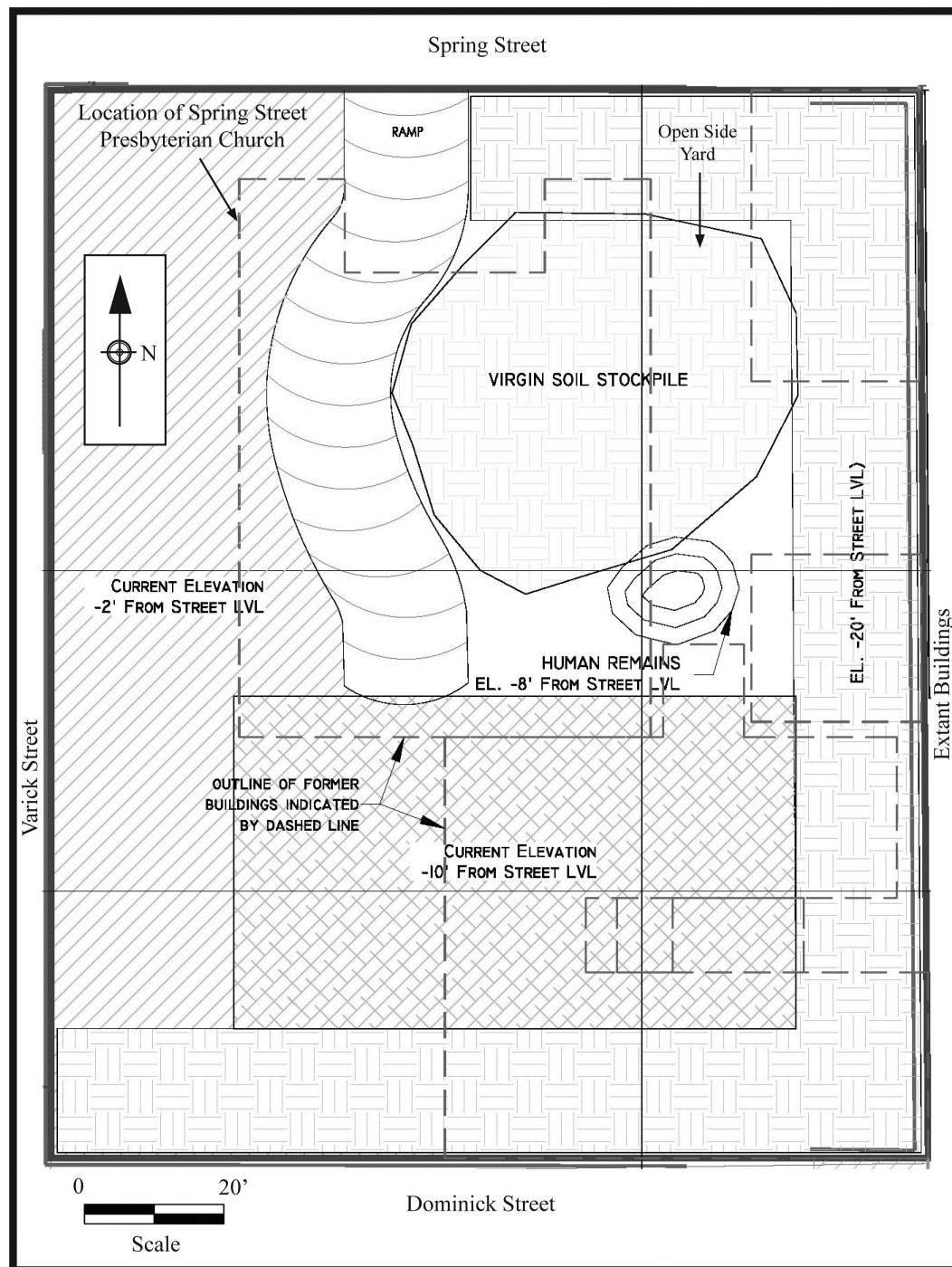


Figure 1. Plan of the construction site showing where human remains were initially discovered, with respect to the location of the former Spring Street Presbyterian Church property. (Image courtesy of URS Corporation.)

movement to establish sprawling rural garden cemeteries on the outskirts of cities had not yet begun at this time, and, so, churches were required to create their own burial facilities or leave their congregants to the horrors of potter's field. A later 19th-century commentator writing about the 1832 construction of the Wesley Methodist Episcopal Chapel burial vaults noted that "wealthy churches" that could afford to purchase large parcels of land "had burying-grounds attached to them," while poor churches, forced to make due with smaller lots, "built vaults" (*New York Times*, April 4, 1880). Given the financial limitations of the Spring Street congregation, the construction of burial vaults may have been the only available option. Similarly, the long-term cost for the care and maintenance of underground vaults versus cemeteries also may have played a role in their decision.

Initial Explorations

Archaeological investigations of the church and its burial vaults began in December 2007, after construction crews excavating for a new hotel/condominium complex at the corner of Spring and Varick Streets impacted the buried church vaults and exposed human remains. Subsequent investigations of this discovery by the Office of the Chief Medical Examiner (OCME) recovered the remains of a minimum of 16 individuals, representing men, women, and children, from the surface of the site, (Crowder et al. 2008; Morin, this volume). Archaeological investigations within the 175-ft. by 130-ft. Spring Street construction site were started within days of the OCME inspection and were overseen by the staff of the New York City Landmarks Preservation Commission, in consultation with members of the Professional Archaeologists of New York City (PANYC).

At that time, little was known about the history of this location or of the Spring Street Church. Initial background research conducted by AKRF soon determined that the location where human remains were discovered (referred to as the "find spot") fell within the southeastern corner of the original church property, within one of the two open side yards that once flanked the church building

(FIG. 1). But this early research found no evidence that the church property ever contained a cemetery or other burial facilities. Consequently, initial archaeological investigations sought to identify the origin and historical/depositional contexts for the human remains impacted by the construction activities and to determine if additional remains were present in other areas of the site.

Early fieldwork involved two concurrently performed tasks – monitoring renewed construction excavations through incomplete sections of the building footprint and conducting thorough investigations of the initial find spot. Construction monitoring was completed over the course of the ensuing few weeks and found no additional skeletal material in any other portion of the site. Archaeologists identified and mapped the foundations of the ca. 1836 Spring Street Presbyterian Church and determined that the church had been built on shallow stone foundations with no attendant basement level. Efforts to find evidence of the first (1811–1835) church building, however, proved fruitless. Careful monitoring of the open yard space formerly bounding the west side of the church property found that it had never been used for burial or interment purposes.

Hand excavation within the original find spot revealed that all skeletal material examined by OCME staff was derived from soil and rubble recently disturbed by site machinery. Archaeologists recovered significant quantities of disarticulated and sometimes badly crushed human bone scattered over an area within an approximate 50-ft. radius of the find spot. This material consisted of a mix of cranial and post-cranial elements, representing the remains of multiple individuals of various ages and genders, and was interspersed randomly throughout the demolition debris. The densest clusters of remains were situated in close proximity to the original find spot and were comprised of loose, co-mingled pockets of bone mixed with concentrations of badly decayed wood, likely coffin wood, and a variety of funerary artifacts. These artifacts consisted primarily of probable coffin nails and screws, but also included scattered coffin hinges and a handful of fragmentary coffin lid plates.

Once all disarticulated remains and associated artifacts were documented and collected from the original find spot, construction

machinery was used to clear remnant demolition debris from the area and to assist in the search for any intact historic burials. This process gradually uncovered stone and brick walls framing a series of connected “rooms”, or chambers, oriented along a north-south axis within what had once been the far south-east corner of the former Spring Street Church property. Ultimately, a total of three partially intact rooms were discovered just to the north of the original find spot while a badly damaged fourth structure was uncovered beneath the find spot (FIG. 2).

The unearthing of these chambers coincided with the discovery of surviving church records indicating that the Spring Street Church congregation had constructed four subterranean burial vaults on their property during the 1820s and early 1830s. Unfortunately, references to the vaults in surviving church documents were limited to a series of entries in the minutes of the church trustees and provided minimal information

about the use of the vaults, the individuals interred within them, or the duration of their use. Likewise, only trace data was found in these documents that could be used to guide the archaeological investigations or to help interpret the results.

To determine if the stone-and-brick structures were the remnants of these vaults and if they continued to hold intact human remains, a number of small test pits were excavated within each of the chambers. In all cases, test excavations confirmed that quantities of human bone and/or coffin wood were present beneath the demolition rubble, soil, and ash/cinder matrix that filled the interior of the vaults. In at least two of the vaults, exposed human remains were quite densely packed and, in one case, these remains were represented by what appeared to be a series of in situ human remains stacked one atop another. Archaeological testing eventually determined that the southernmost burial vault had been extensively impacted during recent site



Figure 2. A section of the burial vaults as initially uncovered. (Photograph courtesy of URS Corporation.)



Figure 3. Excavating the burial vaults under the temporary shelter. (Photograph courtesy of URS Corporation.)

excavation and that disturbed skeletal material from the original find spot likely represented remains relocated from within this space.

Based on the evidence that intact historical burial remains were preserved on the site, preparations were made to archaeologically document and recover the remains of the church members interred within the vaults. The goal of this phase of the project was to recover 100% of all human remains and related funerary artifacts contained within the burial vaults in a manner that ensured the greatest possible degree of respect for the deceased. In the process, both the burial vault structures and the disposition and organization of human remains within them were thoroughly documented.

Methodology

During the recovery phase of the investigations, each burial vault was treated as an independent unit of study and documentation. For this purpose the vaults were assigned sequential identification numbers from 1 to 4, with the

southernmost chamber arbitrarily designated Vault 1 and the northernmost Vault 4. All human remains and associated artifacts within each of these chambers were excavated, recorded, and mapped separately from those in adjacent vaults. Because the site remained an active construction zone, all archaeological activities were confined to the interior of the vault foundations. Available work space additionally was restricted by the temporary shelter erected over the vaults to protect remains from both the elements and the view of curious onlookers (FIG. 3).

The archaeological excavation and recovery of remains within the vaults was conducted exclusively by hand and utilized methods and approaches dictated by the highly variable preservation and distribution of skeletal material within each vault. The primary limiting factor affecting approaches to the excavation and documentation process was the presence of large amounts of jumbled, disarticulated remains, as well as significant quantities of

skeletal elements that were badly crushed. These conditions made the systematic exposure and documentation of remains within a given vault considerably more difficult.

A primary focus of the recovery effort was to identify articulated remains representing distinct individuals. Whenever such articulated remains were uncovered, they were assigned unique numerical designations consisting of two parts: vault of origin and a sequential burial number within that vault (e.g., Vault 2 Burial 5; Vault 4 Burial 16). Broad criteria for designating individual burials were established in the field in consultation with Dr. Thomas A. Crist, the project bioarchaeologist. Because of the highly variable nature of preservation within the vaults and because articulated remains were often encountered within jumbles of disarticulated skeletal elements, none of the identified individual burials were 100% complete. In fact, identified burials exhibited a wide range of skeletal representation, and ranged from as little as 30% complete to as much as 90% intact. Missing skeletal elements, in many instances, were impacted by later activities or, in the case of smaller bones like those of the hands and feet, had become intermingled with surrounding disarticulated material. Once again, because of varying conditions, no universal standards or hard-and-fast minimum criteria could be employed in making these determinations, other than that identified articulated remains were judged to be clearly and unambiguously associated with and indicative of a single distinct person. Ultimately, each case was evaluated independently, and discrete burial designations were made by the author at the time of excavation.

Given that a significant proportion of the vault remains were extremely poorly preserved, recovery efforts intended to collect 100% of the human remains present were augmented by screening the associated soil matrix through standard ¼-inch hardware cloth. In instances where pockets of crushed bone were encountered, efforts were made to collect and bag both the pulverized bone and associated soil matrix. While these severely impacted remains were of no analytic value whatsoever, they were recovered for purposes of reburial. Unlike identified discrete burials, all disturbed/disassociated and crushed remains were assigned only a general provenience according

to their respective vaults of origin and were collected, bagged, and boxed as a single unit.

Burial Vaults

Efforts to fully document the vault construction were hindered greatly by the fact that each of the four vaults had been impacted to varying degrees prior to the start of the investigations. These impacts resulted in the highly differential preservation of specific construction details with significant portions of the vaults having been nearly completely destroyed and several of the surviving walls having been dislodged to varying degrees. To further confuse matters, evidence was found suggesting that the vaults had been impacted on multiple occasions since their original construction.

The four subterranean burial chambers were constructed in two stages between circa 1820 and 1831. The vaults were located along the southeastern margin of the church property within a perpetually open side yard and were approximately two ft. east of the foundations of the second (1836) church building. Assuming that our understanding of the dimensions and placement of the original (1811) frame church is accurate, the vaults were located approximately 17–18 ft. directly east of that earlier structure's northeast corner (FIG. 4). No evidence was found, in either the excavations or the historic documents, to suggest that any of the vaults were ever connected via a passageway or other access to the church itself.

The burial vaults measured some 42 ft. (north-south) long by 17 ft. (east-west) wide, were contiguous to one another, and were constructed of a combination of stone and brick. Of these four chambers, the northern two (designated Vaults 3 and 4) were the first vaults constructed on the property, in or about 1820, and exhibited the best overall preservation. The exterior walls for these chambers were approximately 1.75-ft. thick and made of mortared, rough-dressed stone. Although parts of these walls were truncated during the removal of demolition rubble, segments along the western and northern sides remained intact to a height of approximately five ft. above the vault floor. Within these foundations, Vaults 3 and 4 were divided by a one-ft.-thick, east-west-oriented, mortared brick wall. The interior space of each chamber measured nine ft. north-south by fourteen ft. east-west, and encompassed a

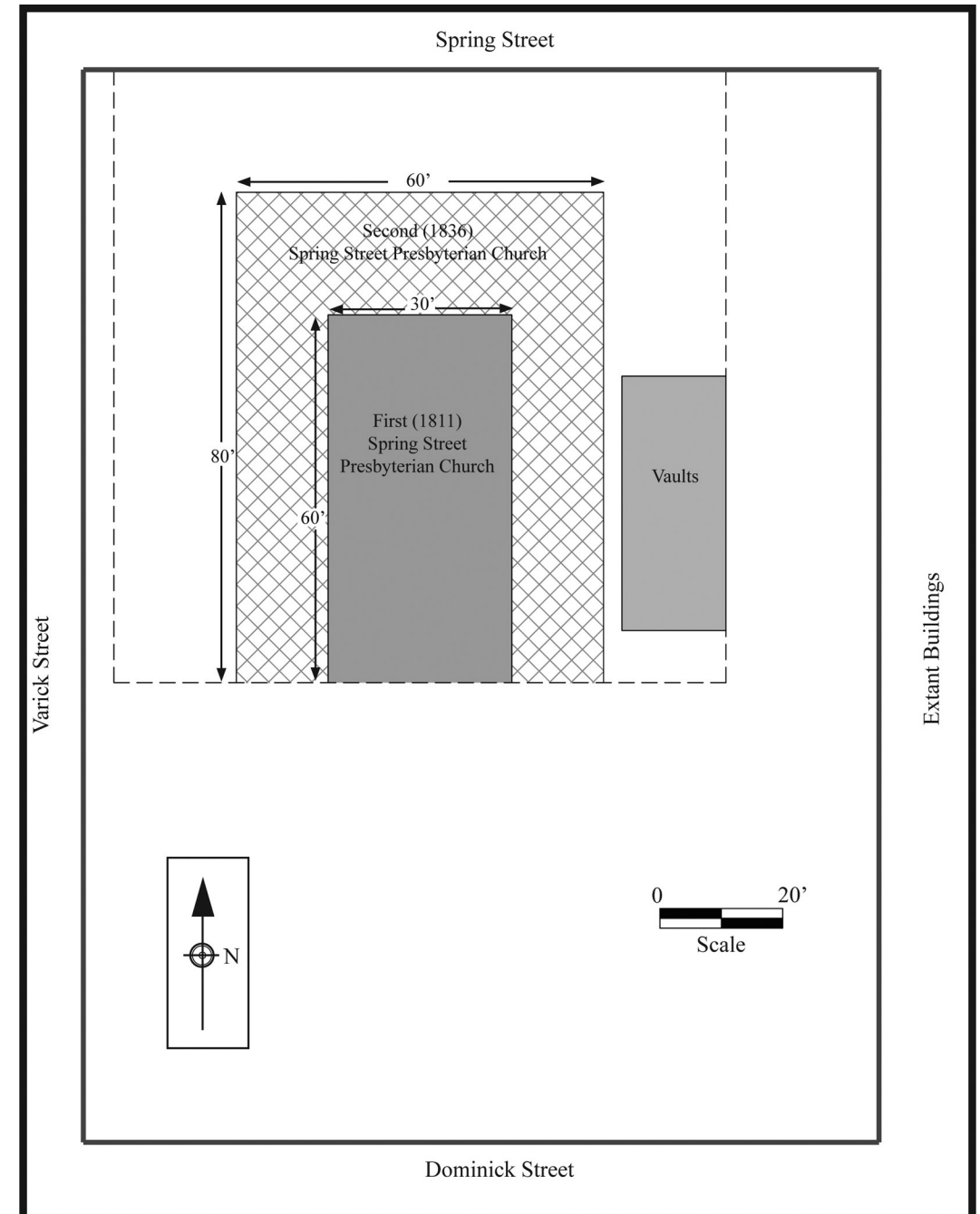


Figure 4. Location of the burial vaults within the church property, and with respect to both the first and second church buildings. (Image courtesy of URS Corporation.)

total area of 126 ft.². These northern chambers did not have prepared floors, but rather bot-tomed out onto naturally occurring, moderately coarse, sand subsoil (FIG. 5).

The southern two chambers, designated Vaults 1 and 2, respectively, were constructed entirely of brick and consisted of three outer walls appended to the southernmost stone wall of Vault 3. Based on this configuration, Vaults 1 and 2 are interpreted as the funerary structures added to the site in 1831. Overall, the construction of Vaults 1 and 2 was somewhat less substantial than that of Vaults 3 and 4 and may be, in part, a reflection of the church trustees' desire to have the new burial chambers built "at the lowest terms offered" (Spring Street Presbyterian Church Trustees Record 1826–1841, quoted in Meade 2008).

The outer walls of these vaults measured approximately 1.5 ft. thick, while the east-west wall dividing Vaults 1 and 2 measured 1.0 ft. thick. The interior spaces of these southern vaults appear to have been slightly smaller than their northern neighbors and measured approximately 8.8 ft. north-south by 14 ft. east-west. Unlike their older neighbors, Vaults 1 and 2 both were constructed with prepared floors consisting of dry-laid brick arranged in a running bond pattern. Based on evidence from Vault 2, these newer chambers were also slightly shallower in construction, with the floor of Vault 2 sitting approximately 0.5 ft. above the base elevation of Vaults 3 and 4.

Unlike Vaults 3 and 4, the walls and physical structure of Vaults 1 and 2 were extensively impacted during initial construction activities for the new hotel/condominium. Vault 1 was the most heavily damaged of the two chambers and was extensively disturbed by excavation machinery. Archaeological investigations revealed that the only fragments of this vault surviving in situ consisted of a small segment of the eastern wall and interior floor, along with a tiny section of the southeast corner wall and associated brick floor. All remaining portions of this chamber had been completely removed. Vault 2, on the other hand, exhibited a considerably greater degree of preservation and was represented by truncated and fragmentary outer walls and a 60–70% intact brick floor (FIG. 6).

With the understanding that the vault structures had been extensively impacted,

investigations found no architectural or structural evidence of features related to the interior partitioning of burial space that might be associated with the intentional segregation of remains by familial association, socioeconomic status, standing within the church hierarchy, or other criteria. None of the chambers contained any trace, either in the surviving floors or walls, of having been once separated into smaller spaces by additional interior walls or other dividers. Family burial vaults in other parts of the country, such as those associated with Christ Church in Philadelphia (John Hopkins, pers. comm. Dec. 7, 2007) or at the Congressional Cemetery in Washington, D. C. (Association for the Preservation of Historic Congressional Cemetery 2012), are known to have been constructed with benches or shelves attached to the walls so that coffins could be raised off the floor and not stacked on top of one another. It is possible, however, that evidence for interior partitioning was removed by past impacts to the vaults, and so the lack of archaeological evidence in this case may not accurately reflect the historical division and use of space within these chambers.

It is presumed that the Spring Street burial chambers originally would have been constructed with vaulted brick ceilings. Descriptions of contemporary funerary vaults within public burying grounds in the greater New York City vicinity (e.g., National Board of Health 1879) note that this was a common construction feature and, by comparison, suggest that ceilings in the Spring Street burial chambers may have been perhaps 8 ft. high at their apex. Although such a ceiling configuration cannot be confirmed, both Vaults 3 and 4 contained large curved sections of mortared brick in the fill matrix that could have once been part of a vaulted structure. If the Spring Street burial chambers were constructed in this manner, then the roof arch probably protruded above the surrounding ground surface and was likely covered by a mounded earthen cap several feet thick. Entrance to the vaults is presumed to have been through metal doors at the surface of this mound. Given that no evidence of doors or other passages connecting the various chambers was identified, each vault may have been equipped with its own set of entrance doors. It is not known whether or not these vaults were vented to the open air in any way.



Figure 5. Overview of Vaults 3 and 4 after excavation. (Photograph courtesy of URS Corporation.)

The presence of possible ceiling remnants within Vaults 3 and 4 also suggests that the Spring Street burial chambers had been impacted to some extent prior to the start of hotel construction. Specifically, the presence of ceiling fragments within these chambers may indicate that the vaults collapsed inward when the church was demolished to make way for a public parking lot in the mid-1960s. This situation would, in fact, be expected if the vault ceilings and/or associated earthen cap extended above the surrounding ground surface and required leveling. Artifacts supporting the timing of this event were found within the fill matrix capping the human remains in the northern two vaults and included pieces of asphalt paving, plastic-coated industrial wiring, and at least one hobble skirt Coca-Cola bottle (manufactured 1915–1970). If this interpretation is accurate, then other materials (gravel, ash/cinder, demolition rubble, etc.) capping the human remains within these vaults were likely added

after the ceilings collapsed to fill the remaining voids and to prevent the subsequent subsidence of the parking lot surface.

Lastly, evidence of even earlier impacts to the vaults was found during the controlled excavation of remains from Vaults 3 and 4. Those chambers contained remnants of four internal supporting piers/columns that may have been installed as a means to correct a structural failure in the arch. These support columns were aligned north-south along the western foundation of Vaults 3 and 4, two in each chamber, and were constructed of mortared brick atop simple stone slab footers (FIGS. 5 AND 7). The columns in Vault 3 were the better preserved examples and consisted of vertical members measuring 0.8 and 1.6 ft. in total height while those in Vault 4 were represented by only the stone slab footers. In both chambers, the sand floor surrounding the columns contained variable amounts of both lime and mortar, suggesting that the mortar used to construct these supports was mixed within the

bottom of the vaults. The construction of these supports, in turn, may have disturbed adjacent in situ human remains. No evidence of similar support piers was found within either Vaults 1 or 2.

While it is not known with certainty when these support columns might have been installed, these repairs may have been made during the period when Vaults 3 and 4 were still receiving burials. Historic documents indicate that failures to burial vault ceilings may not have been uncommon. On April 6, 1880, the *New York Times* reported the following instance of a similar, though far more severe, structural failure.

An inspection was made yesterday by Dr. E. H. Janes, Assistant Sanitary Superintendent of the Health Department, of the vault of the Attorney Street Methodist church, which caved in on Friday morning. . . A contract has been made by the Trustees for the repair of the break in the roof of the vault, and the work will be commenced forthwith. Two brick walls for the support of the arch will be erected, and the exposed remains will be covered by the earth excavated for the foundations of these walls (*New York Times*, April 6, 1880).

Interestingly, this case too was rectified through the construction of secondary interior support structures to brace the ceiling. An article in the *Times* two days earlier (April 4) provides some details regarding the impact the ceiling collapse had on remains within these vaults, noting that:

When the arch fell in...the three feet of earth which was above it went down with the mass, and kindly covered up the crushed remains of poor mortality below. A few broken coffins and some parts of skeletons were lying visible among the rubbish (*New York Times*, April 4, 1880).

Human Remains

Excavation of the burial vaults confirmed the findings of the preliminary testing. With the exception of Vault 1, these chambers contained large amounts of human skeletal remains and associated funerary deposits. The human remains primarily consisted of deposits of disassociated skeletal elements with widely disparate states of preservation



Figure 6. Overview of Vault 2 after excavation. (Photograph courtesy of URS Corporation.)

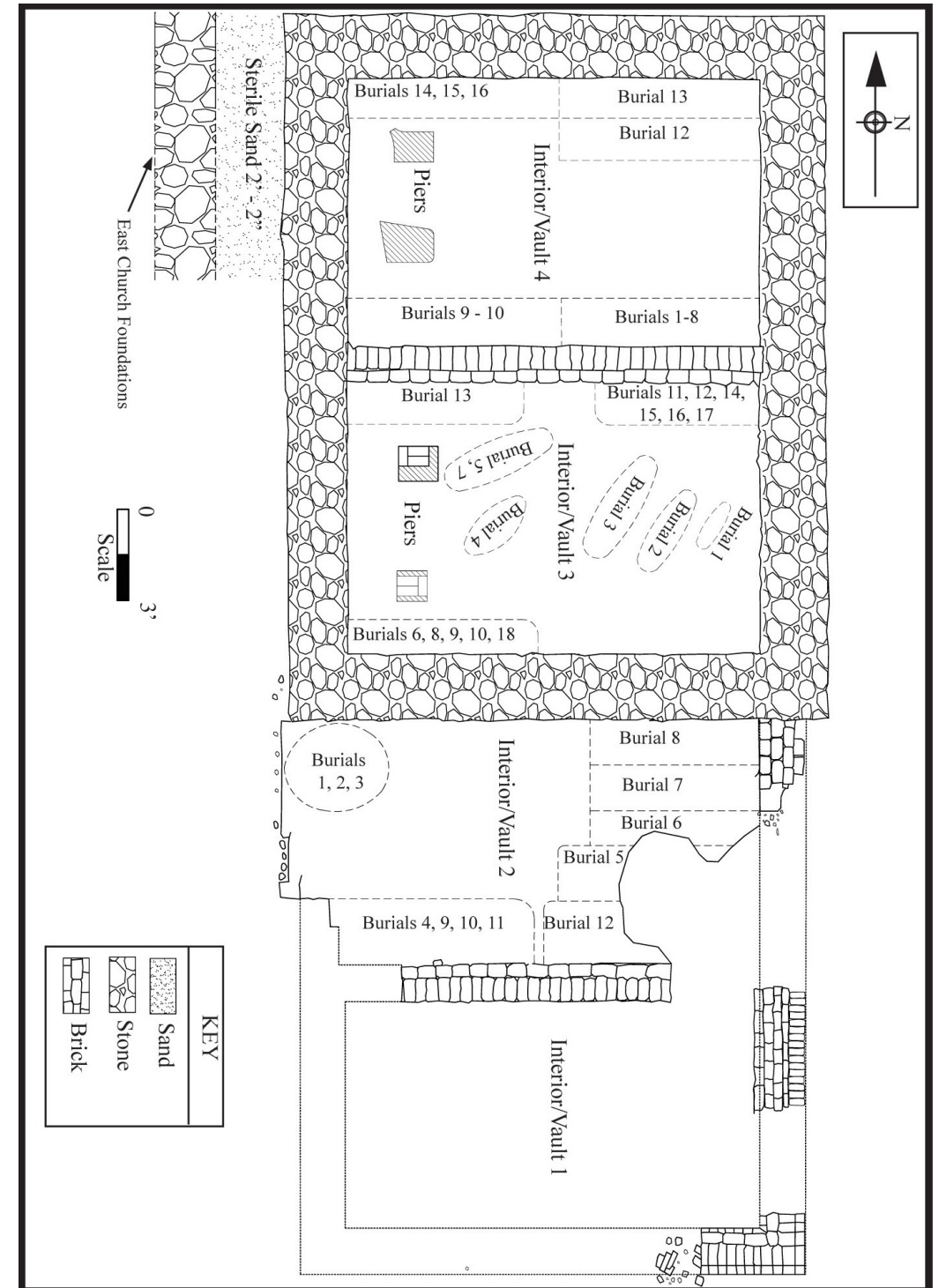


Figure 7. Detail of vault plan showing the distribution of intact or partially intact burials within the burial chambers. (Image courtesy of URS Corporation.)

from completely intact to badly crushed. These remains were interspersed with large quantities of coffin wood remnants, the majority of which were poorly preserved and badly crushed. Better-preserved sections of coffin wood were evident in some instances, however, and provided insights to their appearance and method of manufacture. A considerable amount of brickbats and other construction debris also were mixed in with the remains.

Despite the generally jumbled condition and variable preservation of the burial deposits, URS archaeologists were able to delineate a total of 46 variably complete burials within this assemblage. The disarticulation of the remains was likely associated with a variety of causes and occurred on multiple occasions in the past.

Of all the vaults, the southernmost (Vault 1) stands out from the others in that it contained only trace evidence of human remains. The recovered remains consisted of a small amount of fragmentary skeletal material found in

direct association with the remnant wall at the chamber's southeast corner. While the rest of the vault was found to be completely devoid of *in situ* remains, all available evidence suggests that at least some burials were still contained within this space prior to the start of the construction excavation. Skeletal remains recovered from demolition debris within the initial find spot, representing a minimum of 16 individuals, are believed to have been those originally contained within Vault 1.

In Vaults 2, 3, and 4, human remains lined the floors of the chambers and were contained in deposits that varied in depth from just a few inches to 1.5 ft. Within each vault, highly jumbled deposits of disarticulated and comingled skeletal elements represented the largest proportion of remains; however, large quantities of crushed remains and better-preserved pockets of articulated burial remains also were identified. Skeletal material was not distributed evenly over these three spaces, but, rather, exhibited marked contrasts in the overall

volume of remains within each vault. Vault 4 produced, by far, the largest amount of skeletal material, followed next by Vault 3, and lastly by Vault 2. In terms of general preservation characteristics, identified individual burials in Vault 2 generally showed the least degree of completeness and integrity while Vault 3 possessed the greatest proportion of articulated remains and Vault 4 the largest amount of comingled skeletal elements.

Burial remains exhibited a pattern of dispersal within each vault that was broadly consistent among all three. Excavations revealed that the largest volume of remains was found within relatively limited areas immediately adjacent to the north, east, and south vault walls. Conversely, spaces near the center and western margins of these vaults contained dramatically reduced quantities of bone and related artifacts, and, in some instances, only trace amounts were present in these areas. Within the high-density areas of each room, remains located along the north and south vault walls showed a much higher degree of preservation and produced the largest number of articulated burials. In contrast, remains along the eastern walls were generally poorly preserved, frequently showed signs of extreme crushing, and were often represented by multiple stacked coffins that had been pancaked *in situ*, one on top of the other. This internal patterning of remains was most pronounced in Vaults 3 and 4 while in Vault 2 the internal distribution of burial deposits was slightly less clear cut.

Despite the generally disassociated and comingled nature of the Spring Street skeletal material, members of the archaeological team identified 46 partially intact interments within the burial deposits, representing the remains of 47 individuals (Vault 3, Burial 17 consisted of the remains of both a young woman and her full-term fetus; subsequently re-designated burials 17A and 17B). Of the delineated burials, 12 were found in Vault 2, 16 in Vault 3, and 18 in Vault 4 (FIG. 7). These remains were recovered from a variety of depositional contexts and, similar to the larger assemblage, consisted of skeletal material exhibiting widely variable states of preservation. The majority of the intact burials were located at the bottom of dense piles of disarticulated skeletal material adjacent to the north and south walls of the separate vault spaces. Burials in this context

were represented both by groups of more or less complete remains stacked one atop the other (FIG. 8), as single and stacked truncated remains (FIG. 9), and as those that were apparently complete but badly crushed. In several instances, primarily in Vault 4, burials were identified within deep pockets of jumbled, disarticulated remains (FIG. 10). Lastly, in a small number of cases, partially intact burials were identified in more central parts of the vaults, away from walls and beneath dense fill and demolition rubble deposits. Remains recovered in these latter contexts were nearly always badly crushed with almost no intact bone remaining.

Despite the overall disturbed and disassociated nature of the larger assemblage, the physical arrangement of most of the partially intact burials complied with common Judeo-Christian funerary practices; all but a few examples were oriented in an east-west direction with the head to the west. Preliminary field examinations suggested that the individuals interred in these vaults likely comprised a representational cross section of the larger church congregation. Males and females of all life stages were identified and a significant proportion of the total collection was comprised of subadults; this latter finding was consistent with historical documents indicating that large numbers of children were buried in the vaults (Meade 2008).

While articulated remains indicated that at least 46 interments were contained within Vaults 2–4, the presence of large numbers of intact skulls and partial crania among the comingled skeletal elements suggested that the total burial population was significantly larger. Basic demographic data for the 46 burials identified in the field, as determined from post-excavation bioarchaeological analyses of remains, are summarized in Table 1 (Crist et al. 2008; see also Crist, this volume) (TAB. 1). It should be noted that Vault 4, Burials 1–4 were originally identified in the field as being associated with distinct children; however, subsequent analysis revealed these remains to be those of multiple comingled children (assigned distinctive letter designations during post excavation analysis). This situation is indicative of the challenges faced during the excavation of these vaults, especially in the earliest stages, and the difficulty sometimes encountered in trying to delineate discrete burials.



Figure 8. Stacked intact burials within Vault 3. (Photograph courtesy of URS Corporation.)

Table 1. Age at death and gender summary for field-identified burials*

Burial #	Sex†	Age range	Burial #	Sex†	Age range
Vault 2			Vault 4		
1	F	<35	1-4A	C	5 mos. fetus
2	C	2.5-3.5	1-4B	C	<6 mos.
3	C	4.5-5.5	1-4C	C	<6 mos.
4	F	40-49	1-4D	C	2-3 mos.
5	M	<35	1-4E	C	6 mos.
6	F	<35	1-4F	C	6 mos.-1.5 yrs.
7	C	4.5-5.5	1-4G	C	6 mos.-1.5 yrs.
8	F	25-29	1-4H	C	6 mos.-1.5 yrs.
9	M	40-49	1-4I	C	4.5-5.5
10	M	20-29	1-4J	C	5.5-6.5
11	C(F)	14.5-15.5	1-4K	C	2.3-3.5
12	M	20-24	1-4L	C	6 mos.-1.5 yrs.
			1-4M	C	5.5-6.5
Vault 3			1-4N	C	6 mos.-1.5 yrs.
1	F	25-29	1-4O	C	1-3
2	F	20-24	5	M	20-24
3	F	20-24	6	M	35-39
4	M	25+	7	F	30-34
5	M	<35	8	M	60+
6	M	25-29	9	M	50-59
7	F	20-24	10	M	40-44
8	F	25-29	11	F	30-34
9	M	35+	12	M	50-59
10	M	30-34	13	F	20-24
11	M	25-34	14	M	30-34
12	M	70+	15	M	40-44
13	F	30-34	16	C (F)	14.5-15.5
14	M	35-39			
15	M	45-49			
16	M	30-34			
17A and 17B	F	25-29 / full-term			
18	F	25-29			

* Burials with a numeric identifier were identified in the field; letters indicate a burial identified in the lab.

† Male is M; female is F, and child or infant is C.

This information excerpted from the analysis of human remains report (Crist et al. 2008; Appendix D).

Although coffin remains and associated funerary artifacts were often poorly preserved and found out of direct burial contexts, sufficient data was recovered to allow some insights to be gleaned regarding the burial customs and practices associated with the Spring Street vaults. The characteristics of surviving coffin samples indicate that burials were simple affairs unattended by extravagant decoration or displays of status. Coffins were likely hexagonal in shape with flat lids, although portions of at least one gable-lidded coffin were identified in the field. While some coffins appear to have been stained or painted in bright colors (examples of red- and yellow/gold-colored wood were observed), most did not have a great deal of exterior ornamentation. No coffin handles, escutcheons, or other adorning furniture were recovered during the investigations, and other coffin hardware (hinges, screws, etc.) was, for the most part, purely functional in form and appearance.

The most significant funerary artifacts recovered were a series of more than 30

preserved metal coffin plates engraved with the names and birth/death dates of individuals interred in the vaults. Legible dates on these lid plates spanned the years 1820 through 1846 and provide a more accurate time frame for the use of the vaults than that provided by church records. Unfortunately, almost all the coffin plates were long since separated from their original coffin lids and were discovered as loose artifacts mixed with the jumbled, disarticulated remains. The one exception was a coffin plate found in direct association with an identified burial (Vault 3, Burial 12). This coffin plate was used (in conjunction with osteological analyses) to positively identify the individual as wealthy businessman, Rudolphus Bogert. Additional burial artifacts, such as buttons, articles of jewelry, and other personal items were few and suggest that efforts to prepare the deceased for burial also involved little pomp and ceremony. One specific personal artifact that stood out during fieldwork was a gold wedding band



Figure 9. Stacked truncated and individual truncated burials in Vault 2. (Courtesy of URS Corporation.)

recovered with the remains of Burial 8, in Vault 3; the band had no inscription or other markings that might have helped to identify its owner. Aside from coffin-related artifacts (nails and screws), simple straight pins, used to hold a burial shroud in place, were the most commonly found funerary objects. Shroud pins were recovered in both disturbed contexts and in direct association with many of the better-preserved burials. More detailed descriptions of the Spring Street funerary artifacts along with additional analyses and interpretations of early 19th-century burial customs are discussed elsewhere in this volume (see White and Mooney, this volume).

Assessment of Prior Disturbance

In addition to recovering human remains from the vaults, these investigations also sought to determine what factors contributed to the largely disturbed appearance of the burial deposits. Background research and evidence documented in the field suggest that as many as four separate factors may have contributed to this condition. These factors likely involved natural processes of decomposition, intentional actions on the part of members of the congregation and other persons in renovating and repairing the vaults, and events that were, at least in part, accidental in nature.

Natural Decay

One of the primary factors affecting the integrity of individual burials within the vaults was almost certainly the natural process of bodily decay. As documented in graphic detail by public health researchers in the 19th century, the human body decomposes quickly after death and, in due course, emits an assortment of "offensive gases and putrid liquids" which, in turn, impregnate the surrounding coffin wood, causing it to weaken and decay (Eassie 1875). As the coffins decompose, the remains inside are eventually exposed and are permitted to naturally disarticulate. While few descriptions verifying these conditions have been preserved in the historic record, two accounts, one of which is particularly vivid, have been identified. Cremation advocates investigating burial conditions in England during the last quarter of the 19th century concluded "that entombment in vaults was a more dangerous practice than interment in the

earth, because of the liability of the coffins to burst" (Eassie 1875: 60). During this same period, health inspectors visiting cemetery vaults in Jersey City, New Jersey evocatively described the interior space of these chambers as "gloomy and wet," and noted that "...the condition of the wooden coffins exemplifies every gradation from soundness to complete decay. A few have been renovated, while others have been permitted to crumble until they are disgusting to the sight; two or three exposing their dead" (National Board of Health 1879: 203).

It should be noted that the natural disturbance and disarticulation of burial remains would be further expedited if coffins within the Spring Street vaults were stacked on top of one another, as it appears they were. The decomposition of stacked coffins would make them more prone to collapse, crushing, and, possibly, toppling and violent rupture. A particularly gruesome account of conditions befalling stacked coffins in vaults was recorded in 1850 at the church of St. Mary at Hill in England: "In one spot thirteen coffins are piled one upon the other, many of them broken and crushed; the bones from the upper coffins dropping down among those of the lower, and mixing with them in all stages of decay" (quoted in Reeve 1993: 74). Although it is doubtful that coffins in the Spring Street vaults were ever stacked to this extreme, the implications raised by this example are nonetheless clear and valid.

Rodents and other burrowing creatures represent another natural process of decay possibly affecting the integrity of vault deposits. The potential impacts of this type of bioturbation on interments in the ground of a churchyard is limited by space restrictions inside the grave shaft and coffin; however, the effects of rodent activity on the dispersal of remains in large cavities like vaults would be more pronounced. Although no direct evidence of this disturbance was documented in the Spring Street vaults, the ubiquitous nature of rodents in urban settings and in environments of decay suggests that its occurrence here was likely.

Vault Regulation

As burials accumulated within the Spring Street vaults, it likely became necessary to redistribute coffins and remains along the floor to make room for additional interments.

This task may have involved the collection and repositioning of loose, disarticulated skeletal materials dispersed by the process of natural decay discussed above and surely resulted in additional disturbance and disarticulation of the remains as decomposed coffins were moved, restacked, and/or removed if damaged. Given that persons entering the vaults would have needed space to move around, it is likely that central areas would have been kept reasonably clear of remains—by moving older interments to the periphery of the chambers—thereby creating the distribution of remains identified during this investigation.

Historical accounts indicate that remains within the vaults likely were moved or repositioned at least intermittently over the period of their use. Records show that in March 1830, the church's trustees appointed a committee to regulate the two existing vaults (3 and 4), probably as a way of extending their use life (Meade 2008). While it is not known what actions were implied by the term "regulate," the normal definition of that word suggests that this would call for some reordering of remains within the chambers. Potential evidence indicating that burials had at some point been moved around in this manner was identified during excavation and was represented by a small but significant number of skeletal remains (primarily hand and foot elements) within the largely vacant central parts of Vaults 3 and 4. These remains were found pressed down several inches into the sand floor of those chambers, and appear to have been trampled by people walking and working in these rooms.

Vault Repairs

As discussed previously, archaeological investigations discovered evidence, in the form of internal support piers, that Vaults 3 and 4 were subjected to structural repair at some point during or after their period of active use. These activities also may have contributed to the disturbance of burial remains. The construction of these brick columns would have required raw materials to be brought into the burial chambers and, presumably, the establishment of a suitable workplace in the vaults. The archaeological evidence suggests that mortar used in this construction was mixed directly within the vaults. Portions of the sandy floor immediately surrounding the

piers in both Vaults 3 and 4 contained sometimes-dense concentrations of lime, along with occasional pieces of unused cement mortar. Given the environment within these spaces, it seems probable that sand for use in the mortar was excavated directly from the exposed natural floor.

The distribution of remains within Vaults 3 and 4 may support this interpretation. In both instances, areas immediately surrounding the support columns were almost entirely devoid of burial remains, as were spaces just to the east in the center of the chambers. It seems likely that the creation of necessary workspace to accommodate the temporary storage of raw materials (brick, lime), the movement of laborers, and the collection of sand for the mortar may have required at least some burial remains to be stacked on top of others along the outer walls. Perhaps the dislodged and crushed intact burials in Vault 3 were evidence of this activity.

Site Demolition

Potentially the most significant impacts to the Spring Street burial deposits were caused by the exposure and subsequent infilling of the vaults during the demolition of the site in the late 1960s. Fill deposits immediately overlying the burial remains produced a number of artifacts that were manufactured during the mid-20th century. These artifacts were almost certainly introduced into the vaults when the vaults were broken into by machinery used to clear and grade the site in advance of the construction of the subsequent parking lot. The presence of dense brick rubble overlying the burial deposits, including large sections of wall and curved ceiling elements, indicates that demolition activities caused the vaults to collapse. The remaining void would then have been filled with rubble to level the area for paving.

The introduction of this large amount of demolition debris and its subsequent compaction likely accounted for the majority of damage observed within the burial remains and probably accounts for much of the pattern of crushing identified. Remains located in more central portions of the vaults would have borne the brunt of impacts from the collapse of the roof and the dumping and compaction of rubble fill while those arranged tightly along the outer walls would have been afforded a greater measure of protection from the effects of site demolition.

Discussion and Conclusions

At the time of its completion, this project represented the only known intensive archaeological exploration of historic church vaults within this region of the country. Although comparative archaeological information from contemporary church vaults in this country are not available, conditions within the Spring Street burial chambers appear to share a number of broad similarities with documented English church vaults and American family vaults from the same period. In terms of their overall structure and manner of construction, the Spring Street vaults may have more in common with family tombs, such as those studied in the Historic Congressional Cemetery in Washington, D. C. For the latter cemetery, the earliest vaults are simple rectangular rooms covered by a vaulted ceiling within which coffins “were simply laid on the floor and stacked as more of the family or friends were laid to rest” and where they would eventually “deteriorate and crumble to the floor, as intended.” Later in the 19th century, however, the Congressional Cemetery vaults gradually became more elaborate in their interior design through the addition of shelves and individual crypts for the storage of burial receptacles (Association for the Preservation of the Historic Congressional Cemetery 2012).

In England, numerous church crypts and vaults have been archaeologically documented, including Christ Church in Spitalfields (Reeve and Adams 1993), St. George’s in Bloomsbury (Boston et al. 2009), and St. Luke’s in Islington (Boyle 2005), among others. Although considerable differences are evident between these sites in terms of the structure and use of burial crypts, most of these vaults are located beneath the floor of the church sanctuary and consist of multiple rooms with specific rooms set aside for the use of a single extended family or for those who



Figure 10. Partially intact burial within disarticulated remains in Vault 4. (Photograph courtesy of URS Corporation.)

could afford the increased cost of vault burial (Association of Diocesan and Cathedral Archaeologists 2010). What some of the English burial vaults have in common with Spring Street is the accommodation of large numbers of burials through the practice of stacking burials within individual rooms along with the need for periodic “regulation” of decaying and fallen coffins (Reeve and Adams 1993).

As discussed previously, vault regulation was a process brought about by the natural decay of stacked coffins in the vaults and was required at times to “tidy” the vault interiors, to allow for the placement of additional coffins into the vaults, or, potentially, to speed the decay of remains. Archaeological evidence from the Spring Street vaults suggests that regulation may have been necessary for at least some of these reasons, as well as to allow for the repair of the vault ceilings. In terms of the

degree of coffin decay and the extent of skeletal disarticulation evident, the overall preservation and distribution of Spring Street remains appears to be consistent with that documented during excavations of other contemporary vaults at St. Mary’s at Hill and Christ Church, Spitalfields, in England and observed first-hand by 19th-century health officials in Jersey City, New Jersey (Reeve and Adams 1993, National Board of Health 1879).

Both the English and American family vaults exhibit some manner of differential access to interment or segregation within vaults whether by familial association, wealth, or social status. While the Spring Street vault excavations found no physical or structural evidence of segregation within individual burial chambers, in the form of interior walls, shelves, or crypts used to divide the space, the findings ultimately remain inconclusive about whether or not some form of selective inclusion or partitioning of burials was practiced by the Spring Street congregation. In large measure, the inability to identify any type of burial patterning is due to the highly fragmentary nature of surviving church records, the inability to establish the identities of specific remains interred in the vaults, and the disarticulated nature of the large majority of remains present. At the most basic level, it is not known if interment within the Spring Street vaults was a right granted to all members of the congregation or if access was limited to a specific subset of individuals.

Some distinctions that could be indicative of the intentional differential use of or access to these chambers by members of the congregation were identified. The most obvious differences are evident between Vaults 3 and 4 and involve the disparity in overall volume of remains and the demographic representation of individuals contained within each. Both chambers were built at the same time (circa 1820) and were presumably in use for the same duration; however, despite this similar use-life, Vault 4 contained a volume of human remains that was several orders of magnitude greater than that recovered from Vault 3 (at the writing of this paper bioarchaeological analyses of Vault 4 remains and the calculation of minimum numbers of individuals present was still ongoing). Given a situation where access to the vaults by members of the congregation

was not restricted in any way, this is not the pattern that would be anticipated. Rather, both vaults would be expected to contain a proportionally similar number of individuals. Likewise, it would be expected that the demographic profile of individuals contained in each vault would approach some level of parity. Instead, Vault 3 was found to contain only adult burials, with no subadults/children present, while Vault 4 contained large numbers of men, women, and children. While these disparities hint at the existence of intentional patterning of burials between these vaults, without access to more detailed church records and information regarding the identities of the people interred in the vaults, the true cause or nature of these differences remains uncertain.

Archaeological investigation of the Spring Street Church site produced important baseline data related to the structure and operation of early-to-mid-19th-century church vaults and highlighted some of the problems involved in documenting and extracting meaningful data from these contexts. The paucity of comparable sites in the northeastern United States makes it difficult to know if conditions found at Spring Street are representative of congregational vaults in general. At Spring Street, the main factors inhibiting archaeological documentation and analysis were the dual processes of natural decay and vault regulation that resulted in the disarticulation of skeletal remains and the dislocation and mixing of associated funerary artifacts.

These less-than-ideal conditions were further amplified by later construction-related impacts to both the vaults and the burial remains. Because neither the presence of the vaults nor the conditions within them were known when the investigation began, an overall methodological framework for documenting these burial chambers had to be established in the field with minimal advanced preparation. Inevitably, the initial work within the vaults was performed with a certain degree of tentativeness and second guessing, but was assisted by the participation of team members who possessed a great deal of prior cemetery experience and a thorough knowledge of skeletal anatomy. This latter skill set proved especially valuable when working to parse out skeletal remains associated with

discrete interments from the mass of disarticulated bone surrounding them.

Despite the difficulties encountered, the Spring Street excavations generated a great deal of useful information related to the structure of the vaults and the internal organization of the human remains, the funerary traditions evident in the interment of the deceased, and the demography and medical history of the congregants buried in the vaults. While this data has been helpful in filling gaps in our knowledge, the role played by church vaults, and burial vaults in general, remains an inadequately studied aspect of historic mortuary customs and practices. Hopefully the lessons learned at this site will be useful in planning and guiding future burial vault investigations.

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Douglas Mooney is a Senior Archaeologist with the URS Corporation in Burlington, New Jersey. He served as the Principal Investigator for the Spring Street vault excavations. His research interests include prehistoric, historical, urban, and mortuary archaeology.

Douglas B. Mooney
Senior Archaeologist
URS Corp
437 High Street
Burlington, NJ 08016
douglas.mooney@urs.com