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Bones in the Landfill: A Zooarchaeological Study from Faneuil Hall

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BONES IN THE LANDFILL:
A ZOOARCHAEOLOGICAL STUDY FROM FANEUIL HALL

A Thesis Presented

by

LINDA M. SANTORO

Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

August 2012

Historical Archaeology Program

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ABSTRACT

BONES IN THE LANDFILL: A ZOOARCHAEOLOGICAL STUDY FROM FANEUIL HALL

August 2012

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Directed by Professor David B. Landon

Using data from recent archaeological excavations at Faneuil Hall in Boston, this thesis examines how an 18th-century urban landfill context can be used towards understanding the broader foodways of a city community. Much of today's urban landscape has been artificially created over time, often through the efforts of communities to fill land and dispose of their garbage, and it is important for archaeologists to utilize these contexts in meaningful ways. The Town Dock was gradually filled in with the daily trash of the merchants, shop-keepers, and other residents of the nearby community, and the faunal assemblage gives us a glimpse into the everyday foodways of that Boston community. Domestic mammal meat was the dietary staple, and was augmented by small quantities of domestic and wild birds, saltwater fish and shellfish.

ACKNOWLEDGEMENTS

Thanks to all the people who made this research possible, including the National Parks Service, URS, Inc., and the Fiske Center for Archaeological Research. And a special thanks to my committee members and the friends and family who have put up with me throughout this whole process. To sum it all up:

“So long, and thanks for all the fish.” Douglas Adams

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CHAPTER 1

INTRODUCTION

This thesis examines how an urban landfill context can be used towards understanding the broader foodways of a city community. Landfill often has a negative connotation in archaeology: it lacks specific context; what can you really say about the garbage when you do not know who threw it out? But for urban archaeologists, landfill is not only encountered frequently, it is a resource that can tell us about the changing urban landscape and daily life at the community rather than individual level. Although you cannot necessarily get to the individual level at an urban landfill site, some archaeologists have suggested that “the majority of the urban archaeological record may be an *averaging* of all urban behavior,” so what we are seeing represents general rather than specific patterns (Zierden and Calhoun 1986: 38). This kind of average can help us better understand community scale processes of disposal that incorporates both households and communal trash and will serve to provide contrasting data to the individual households in Boston that have previously been examined archaeologically.

This thesis looks at faunal material from landfill deposits underneath Faneuil Hall, Boston’s iconic 18th-century public market building. As part of the larger community

midden, the faunal remains can tell us about 18th-century foodways in Boston as well as what kind of activities went towards creating the landfill. The faunal remains were recovered during archaeological excavation at Faneuil Hall in 2010 and 2011, undertaken by the National Park Service as part of the larger expanded visitor center and transportation hub project. Over 6800 artifacts (not including faunal remains) were recovered from the single unit excavated and represent almost every type of material class in archaeology from ceramics to flint. Because of the extensive material record produced by the excavation, several other research projects have been done to examine the macrobotanical remains (Meyers 2011), pollen, and preservation of artifacts.

Zooarcheology and the Urban Context

In studying any type of artifact class from urban sites, one of the major issues is how to directly relate the archaeological record to past people's actions. Linking artifacts and assemblages to specific persons in the urban archaeological record is always difficult to accomplish, but as the Faneuil Hall assemblage represents a kind of average of a Boston community, we can examine how the varying factors of animal husbandry, seasonality, and the food distribution systems influence an urban community's foodways and place this particular microcosm of city life into the larger social context. This larger context is necessary in doing zooarchaeology at urban sites because the differences attributed to status and ethnicity could potentially be the result of what is available in the urban market, or the changing perception of meat value over time (Bowen 1992, Zeder 1988). Zooarchaeology is defined as the study of animal remains from archaeological sites (Reitz and Wing 1999) and is an integral way to comprehend the more day-to-day life of people in the past, as animal

bones are “typically the end product of food preparation and consumption, one of the most common daily activities” (Landon 1996: 115).

Rather than focusing on questions of status, race or ethnicity, with the material from Faneuil Hall it is best to ask how the increasing urbanization in Boston influenced the market system and what that entailed for the everyday consumer. With a large-scale economy like Boston, after a certain point residents came to depend on outside resources for food because they could not grow or raise enough within the city to feed themselves (Bowen 1998, Friedmann 1973, Landon 1996). This system of indirect provisioning could translate to a more limited number of species and an increase in standardized meat cuts for the urban consumer, which would then be reflected in the faunal assemblage (Zeder 1988: 12). The change in food distribution over the 18th and 19th centuries also led to increasing physical and psychological distance between people and their food sources. This separation meant that the interaction between the consumer and food occurred at the butcher or wholesaler largely after the meat had been processed, which greatly influenced how people viewed animal parts such as offal, heads, and feet (Bowen 1992, Milne and Crabtree 2001).

Several researchers have attempted to link meat cuts to socio-economic status, or even purchasing power, but this price ranking is typically only possible in the 19th century with the standardization of meat cuts and the presence of published price lists (Schulz and Gust 1983, Huelsbeck 1991, Lyman 1987). This also runs into the issue of the definition of meat quality or value, which was examined by Diana Crader (1984) in her analysis of faunal assemblages from slave areas at Monticello. It is assumed that limb bones, with their greater amount of meat and fat, would be more sought after than the axial skeleton, but Crader points out that meat quality does not necessarily equal status. She demonstrates that the refuse

found in the slave quarters at Monitcello reflect both high and low quality meats, which is not what one would expect (Crader 1984).

The development of a more complex market system prompted rural producers to alter their husbandry practices and raise animals more specifically for the urban market (Bowen 1998: 138). Researchers have demonstrated that increased dairying during the 17th and 18th centuries meant more calves could be sold to the urban market, which is seen in the higher number of calf remains at Boston sites over the course of the 18th century (Bowen 1998:143). In addition, there was a shift in the treatment of sheep, from being raised primarily for their wool to an increasing emphasis on their meat (Bowen 1998, Greenfield 1991). For example, Greenfield (1991) examined change over time at numerous landfill sites in New York City spanning the mid-17th to the 19th century and found a growing use of sheep in the urban diet, which is attributed in part to the increasingly available land for protected pasturage.

Animal husbandry practices are also related to the concept of seasonality, which is defined as “determining the time of year at which various animal and plant resources were most abundant” (Bowen 1988: 161). This can be done through looking at presence and absence of animals at archaeological sites, ages and overall lifecycle of animals, and patterning in skeletal proportions (Bowen 1988). In her seminal study of farm records’ books, Joanne Bowen constructed a model of seasonality that has helped researchers understand what would be available to rural and urban residents at different times of the year. Much of the slaughtering was done in the early to late fall, when meat could be cooked and salted in time for the cold weather to keep it fresh, but the abundance of each animal was dictated by the farmer’s cycle of crops, dairying, and slaughtering (Bowen 1988, Landon 1996). This concept has been put to use in numerous case studies within New England

historical archaeology and has proved quite central in understanding if increasing urbanization did affect rural husbandry practices (Bowen 1998, Landon 1996).

Other researchers have attempted to reconstruct the urban food chain in New York City. Milne and Crabtree (2001), in their study of faunal assemblages from the Five Points, demonstrate how three 19th-century urban households obtained their meat both from commercial butchers and from locally available wild resources (i.e. wild fish, birds and shellfish). Interestingly, when the authors compared these Five Points residents to later 19th-century ones, they found that these later urbanites consumed fewer local wild resources and more standard meat cuts (Milne and Crabtree 2001). For 19th-century urban residents, meat was increasingly brought in through a national distribution network, which entailed a great standardization of meat cuts and dependence on the rest of the country for food (Henn 1984).

Closely linked to the discussion of the urban market is the relationship between the urban consumer and the rural producer. Many zooarchaeologists have tried to elaborate the urban/rural relationship and potential differences in foodways by comparing the assemblages from multiple sites and geographic areas. Overall, researchers have found some general differences in foodways that are related to environmental and market factors (Bowen 1992, Landon 1998, Reitz 1984, Zierdan and Calhoun 1986). The urban diet was usually centered on domestic mammals and birds that were available in markets and rural residents exploited both domestic and wild resources (Reitz 1984: 54-56). In New England, Landon (1996) found that urban assemblages were characterized by fewer wild species, more fresh and salt-water fish, and a greater emphasis on sheep. By analyzing the slaughtering strategy for sheep at urban and rural sites, Landon posits that the larger number of young animals at the urban

sites may indicate that some rural farmers chose “to sell surplus sheep in the city of Boston instead of culling the flocks primarily for rural consumption” (1996: 56).

The effects of changing husbandry patterns and markets should be visible in the archaeological record (Crabtree 1990, Maltby 1979, Zeder 1988). Bowen proposes that with an urban faunal assemblage we can expect “an irregular distribution of body parts, a disproportionate percentage of meat bones, and a low number of bones that are commonly associated with butchering waste” (1998: 138). Landon adds that the increasing specialization in the urban environment would have led to more butchery being done by specialized butchers rather than by individuals at home, with most urban residents buying their meat “from butchers, merchants, and local farmers who brought animals into town” (1996: 56).

The question then becomes how to apply all of this research to a context that represents a community rather than a specific household. The archaeological fieldwork previously done at Faneuil Hall treated the collection as “a historic midden deposited by a community over a relatively short span of time” (LBA 1999: IX 1). The researchers understood the faunal assemblage as a mixture of household and business refuse that was unlikely to have been very disturbed. The faunal remains were not discussed in great depth, likely due to the constraints of the final report, but they did find that domesticated mammals (sheep, cow, pig) were most common and there was very little wild fauna represented (LBA 1999).

Other researchers have attempted to place urban fill deposits into a larger social and time scale (Geismar 1987, Maltby 1979, Rothschild and Balkwill 1993, Zierden and Calhoun 1986). Rothschild and Balkwill (1993), for example, explore changes in early city life by

comparing the faunal remains from landfill, sheet refuse, and feature contexts. The authors examine environmental changes, taphonomic processes, and how the remains could reflect people's actions (Rothschild and Balkwill 1993). The study states that landfill "cannot be tied directly to the occupants of a single piece of land. It is, however, comparable to material from a prehistoric midden...in that it probably contains the debris from a relatively small group" (Rothschild and Balkwill 1993: 75).

It is important to recognize that landfill is a viable resource for archaeological analysis because it represents something like a snapshot into the daily life of an urban community. This present zooarchaeological study can examine how the diet of the Boston community was structured and how it was influenced by environmental and market factors. Understanding the interaction between urbanization, seasonality, and changing animal husbandry patterns will help me analyze the remains from underneath Faneuil Hall and build upon the larger model that has been constructed by zooarchaeologists in New England.

Chapter Layout

This thesis aims to familiarize the reader with the research context of this project and to provide a historical background concerning landfilling activities in urban colonial America before presenting the zooarchaeological analysis of the faunal assemblage and the interpretations reached from the data.

The second chapter highlights the complex series of events that were involved in the creation and filling of Boston's Town Dock, later the site of Faneuil Hall. This chapter also analyzes the research questions and issues frequently examined by archaeologists studying

landfill contexts and details the archaeology, past and present, conducted at Boston's Faneuil Hall.

The third chapter details the zooarchaeological methods used for the analysis of the Faneuil Hall faunal remains and the results it produced. Information regarding taphonomic factors, taxonomic representation, butchery marks, and age data are then used to better understand the type of foodways represented at Faneuil Hall. The results are split up by species to allow a more in-depth discussion of the assemblage.

The fourth chapter brings together the results of the faunal analysis and the documentary data to examine where the fill under Faneuil Hall came from and what the assemblage can tell us about the meat products that were available to the 18th-century Bostonian. These data are then compared with other 18th-century sites in Boston and New York to identify any similarities or differences that may help us better understand the foodways found at Faneuil Hall.

CHAPTER 2

HISTORICAL AND ARCHAEOLOGICAL CONTEXT

History of the Town Dock

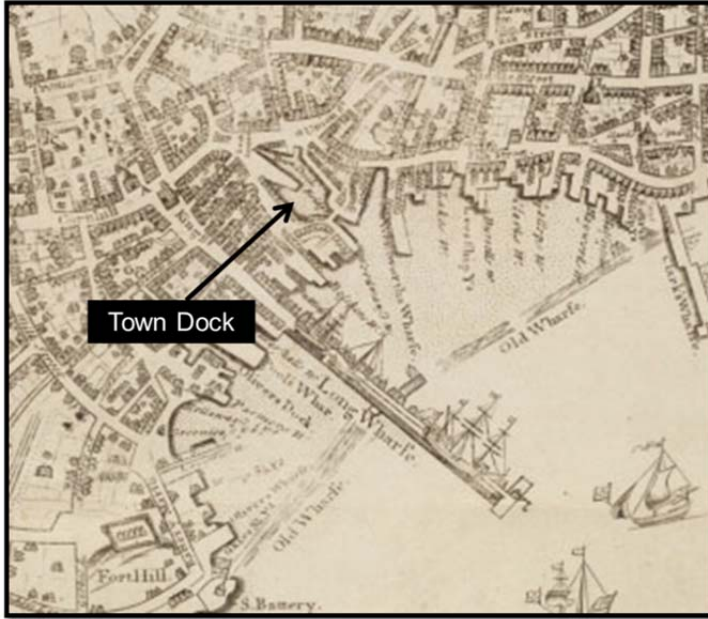
This section focuses on the history of the Town Dock in Boston, on top of which Faneuil Hall was later built. Archaeological excavations of the former Town Dock offer a glimpse into the everyday lives of the local Boston community through their collective trash dump and highlight how early urbanites modified the landscape to suit their needs. This site is a microcosm of landfilling activities in Boston, as varied economic forces caused it to be gradually altered over decades and dictated its changing role within Boston's landscape.

In 1638, 14 proprietors had built a wharf, crane, and warehouse around what was then known as Bendall's Cove (Bridenbaugh 1968). This cove was later leased to the merchant Valentine Hill and his associates, who had the rights to build wharves and docks in the area until 1726, when the land and assets would revert back to town ownership (Bridenbaugh 1968, Seasholes 2003). The site was christened as the Town Dock, and it became an integral part of the city's trading structure. A difference in definitions should be noted here. A dock today signifies an area used for the loading and unloading of cargo from ships, but historically a dock referred to an area of water in an enclosed basin or a slip

between wharfs that, in the 17th century, “provided protection for the relatively small shallow draft ships” (Seasholes 2003:22).

In 1675, both sides of the Town Dock were filled in, making the entrance very narrow, and a swing bridge was constructed to allow pedestrians to pass and control the entrance for ships (Bridenbaugh 1968, Seasholes 2003). The construction of Long Wharf in 1710 heralded the next phase for the Town Dock: smaller enclosed docks were rendered obsolete because they could not accommodate the new, taller ships (Seasholes 2003). As a result, many of the smaller docks in Boston were partially filled in from disuse alone during the 18th century. Being enclosed meant that they captured much of the trash and waste that was dumped in nearby creeks or issued from the town’s haphazard drainage system. For example, the Town Dock’s proximity to the Mill Pond meant that it received a fair portion of trash, as the drawbridge of Mill Creek was the designated area for trash disposal, possibly because people thought the tide would take it out (Blake 1959, Bridenbaugh 1968).

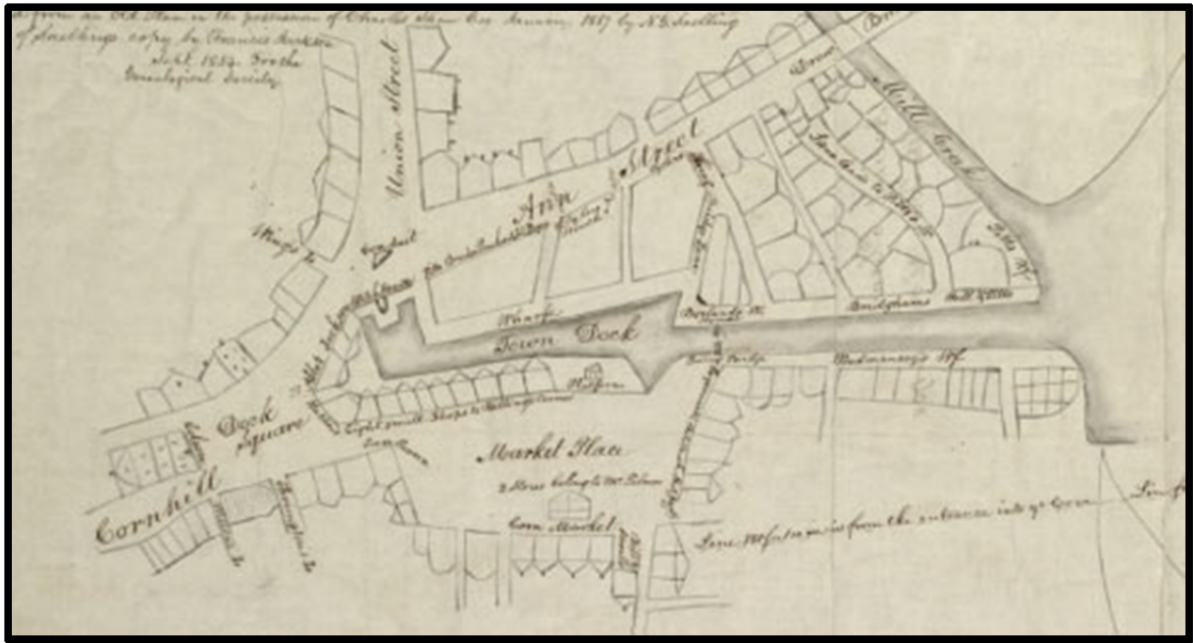
According to historic documents, the main wharf in the Town Dock was repaired and elongated in 1711 (Seasholes 2003:30). We also know that a town vote of the same year ruled that no one could throw their trash into the Town Dock, as the Selectmen were attempting to combat its gradual filling in (Seasholes 2003:33). Bridenbaugh states that the Town Dock was so full of “dirt or trash” from the streets and passers-by that the Selectmen decided they had to levy fines (1968:171). We can see from Figure 1 that before 1723, the Town Dock was largely intact and only small portions had been changed.



*Figure 1: Detail of Town Dock from 1723 Bonner Map
(Source: Norman B. Leventhal Map Center, Boston Public Library).*

The year 1726 saw the end of the 80-year lease held by Hill and his associates, and the buildings and wharf reverted to town ownership. A town committee in 1728 recommended that the wharf be extended so more shops could be built and rented out, since more money could be made from new land than an old dock (Bridenbaugh 1968, Seasholes 2003). On July 1st, 1728, the town selectmen decided to fill in the southern part of Town Dock. The historical documents state “that the town wharfe be continued and extended easterly to joyne the wharfe before the warehouses in the Possession of Mess. Allins, Hough, Cushing &c, viz on a line from the northeast corner of the present wharfe, to the north part of said Allins warehouse, and so the whole south part of the dock to be filled up” (Boston Registry Department 1883: 225). By February of 1729, there were leases for six shops fronting the north side of Dock Square, including a goldsmith, saddler, brazier, tin plater, painter/stainer, and a bookseller (Seasholes 2003, see Figure 2). This quick turn-around suggests that the south side of the Town Dock had to have been filled in between July 1728

(after the decision of the committee), and February 1729, when the new shops were listed (Seasholes 2003). It is likely that the bulk of the faunal remains in this study come from that particular filling episode, although the assemblage probably contains material from both earlier and later events as the Town Dock was repeatedly altered over several decades.



*Figure 2: Detail from 1738 Blake Map of Town Dock.
(Source: Norman B. Leventhal Map Center, Boston Public Library).*

Since the Town Dock could no longer function as a viable part of Boston's shipping and trade apparatus, perhaps it could better serve as a public market place. Merchants' warehouses, stores, and wharves surrounded the Town Dock during the 17th and 18th centuries, making it a natural location for several unofficial markets (Bridenbaugh 1968). This would seem the ideal solution for the use of the town's recently acquired land, but Boston's tumultuous relationship with public markets made the transition difficult (Bridenbaugh 1968, Friedmann 1973).

Bostonians were against the idea of a regulated public market; they preferred street selling to merchants' perceived artificially inflated prices (Friedmann 1973, Kennedy 1992). This did not prevent the Boston Selectmen from attempting to organize a market place numerous times during the 17th century. It also did not prevent all of these markets from failing and being torn down by angry Bostonians. Not giving up, the Town Selectmen decided to try again in 1734, this time opening three markets at Eliot's Wharf, the Old North Church, and the partially filled Town Dock (Bridenbaugh 1968, Friedmann 1973). Unfortunately, soon after its construction the market building around the Town Dock was pulled down by an angry mob and the idea was left alone.

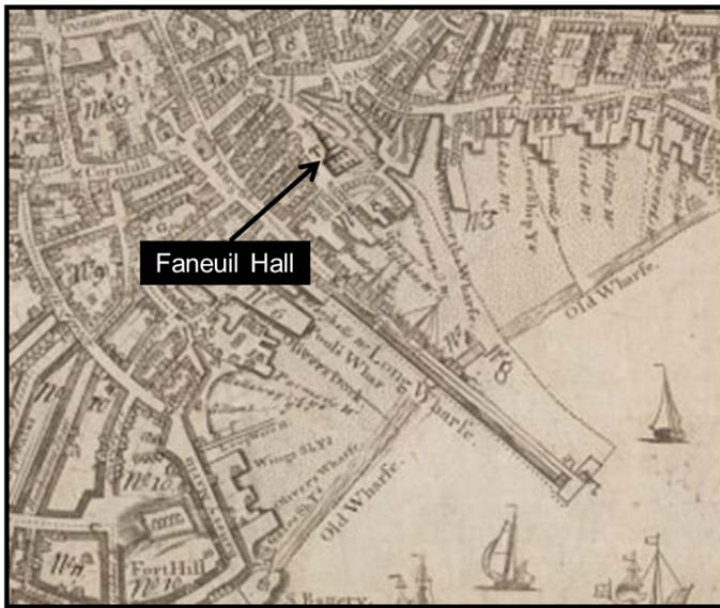


Figure 3: Detail of Town Dock from 1743 Price Map (Source: Norman B. Leventhal Map Center, Boston Public Library).

The fate of the Town Dock changed yet again with the entrance of the merchant Andrew Faneuil. A wealthy and respected Huguenot merchant, Faneuil had the money to fund the construction of yet another market house at the Town Dock, and after much delay it

was built in 1742 (Figure 3, Bridenbaugh 1968, Kennedy 1992). From Figure 3, we can see that when Faneuil Hall was completed, a portion of the Town Dock still existed and it became a source of problems for the city. Due to its highly constricted entrance, its link to the Mill Creek, and the letting out of underground sewers, the Town Dock was so full of garbage and filth that there were numerous petitions to the authorities to fill the rest of it in (Bridenbaugh 1968, Seasholes 2003). Finally, in 1783 the government agreed that the dock should be filled in as far as the swing bridge, which was completed by May 1784 (Seasholes 2003). The rest of the Town Dock disappeared with the construction of Quincy, South, and North Markets in the 19th century, and its modern appearance was set.

Archaeology and Landfill

The complex filling history of Boston's Town Dock demonstrates how the archaeological study of urban landfill contexts can aid in understanding the development of America's early cities. The need for land, that ever-precious commodity, pushed many cities to focus on making more of it through artificial processes: "Europeans altered the city's terrain on an unprecedented scale. They leveled hills, drained marshes, and filled in ravines to make the land suitable for their needs" (Cantwell and DiZerega Wall 2001: 224).

Archaeological studies of landfill contexts have offered researchers the opportunity to study the processes involved in wharf construction and landmaking activities and how those changed over time. For this present study, it is crucial to determine who potentially contributed to the fill underneath Faneuil Hall and what materials would have been used.

Boston is an example of a city whose inhabitants began altering and modifying the environment almost as soon as they landed (Whitehall 1968). Originally the Shawmut

peninsula, Boston was a quasi-island surrounded by mudflats, salt marshes, and tidal areas, and was described as “an area of less than one thousand acres, and [was] very irregular in shape” (Shurtleff 1871: 36). Hills and mountains marked Boston’s original landscape: settlers called their new home Trimountain because of “the pronounced hill upon it which had three distinct heads or summits,” one of which, Beacon Hill, is a much-altered remainder (Shurtleff 1871: 25). Overall, it is estimated that landmaking activities in Boston have created roughly 5250 acres of land and probably doubled the area of the original Shawmut peninsula (Seasholes 2003: 2).

The Boston shoreline began changing drastically in 1641 with the adoption of a law that gave property owners the rights to all land to either the low tide line mark or 1650 feet from the high tide line (Seasholes 2003: 3). Similarly, in New York City the Dongan Charter of 1680 allowed the city government to raise money by selling the right to build wharves and make land out in the river between the low and high tide watermarks (Cantwell and Wall 2001: 225). And in 1731, New York City’s Governor Montgomerie “secured for the common council the extension of the city’s borders to 400 feet beyond low-water mark on the Hudson and East rivers” (Cantwell and DiZerega Wall 2001: 33). These events in both cities sparked a kind of colonial building boom, as urbanites were prompted to claim and fill in the land around their original lot.

Archaeological excavations on urban waterfronts have highlighted the varying types of structures used in colonial merchant and landmaking activities (Bradley et al 1983, LBA 1999, Heintzeman 1985). Construction utilized a method that had not likely changed for centuries: modify the shoreline, build some sort of container, and fill it up. The typically wooden structure was “a grid of timbers...stacked one atop the other; and then, fill was

deposited into the voids. Thus, a stable platform was formed upon which additional fill was added” (Balicki 1998: 110). The resulting wharf and made land could then either be used as a more solid place for the transfer of goods, or as better land to sell (Balicki 1998, Seasholes 2003). Interestingly, differences in waterfront structures between Boston and New York underscore the influence of the colonial mother country: wharves (either timber or stone) for the British, and slips for the Dutch (Heintzelman 1985, Huey 1984).

Most of the early construction and land making projects in Boston were “consummated by private persons with the ‘liberty’ of the selectmen;” merchants, speculators, and traders who needed the wharves or the marketable land, and were willing to pay the construction costs (Bridenbaugh 1968: 20). The town would frequently lease out an area of “wasteland” to merchants or an organization, requiring them to construct wharves, docks, or mills for the benefit of the town’s trade. The leaseholders would have property rights for a set number of years, after which the buildings and land would revert back to the town holdings. In the case of the Town Dock, it was the merchant Valentine Hill and his associates who originally constructed the dock and accompanying wharves under their 80 year lease with the town, but when the dock was partially filled in 1728-29, it was likely the neighboring warehouses and adjacent shop owners who contributed their trash to the now-defunct dock.

Since the Faneuil Hall assemblage represents an opportunity to look at community scale activities and trash disposal, some of the more pressing questions we can examine about land making activities are: what was used to fill these structures and where did it come from? Unfortunately, since many similar archaeological sites in the Northeast were excavated as salvage operations, much of what was recorded represents only a small sample

of what the site could have yielded, so the exact natures of the artifact and faunal assemblages are unknown. However, researchers have frequently attempted to divide the landfill into the larger categories of domestic and commercial refuse. For example, the previous excavation at Faneuil Hall separated the faunal remains into domestic, commercial and butchery waste in an effort to distinguish different site formation processes within the fill (LBA 1999).

Although the source of landfill is rarely specified by the landowners or documented during the process, we know from historical records that opinions regarding the disposal of animal and other organic remains changed with the adoption of new laws (Blake 1959). Public health and sanitary measures were frequently left to individual Bostonian to take care of: “individuals built and maintained their own wells, privies, and drains and disposed of refuse unencumbered by City regulation. The only sanitary regulation was a 1634 ordinance forbidding the disposal of fish and garbage near town docks” (Balicki 1998: 103). However, beginning in the 1650s, city officials became more involved and restricted where residents could dispose of their domestic and animal trash, and for the first time elected scavengers to clear the streets of refuse (Blake 1959). Butchers were the notable culprits, as many failed to properly dispose of blood and entrails, throwing them in the street or the nearest water source (Bridenbaugh 1968, Keene 1982). An act in 1692 attempted to assign specific places where butchers, distillers, chandlers, and curriers could do their work to try to control where the waste went (Blake 1959: 29). One of these designated locations was the drawbridge of the Mill Creek, which flowed into the Town Dock (Bridenbaugh 1968).

This information helps us figure out the source of the fill underneath Faneuil Hall came from. Local garbage from the town’s ad-hoc sanitation system, the Mill Creek, and the

city streets contributed, since historic sources tell us that by 1711, Boston's Town Dock contained so much dirt and trash that the government had to levy fines against the offenders (Bridenbaugh 1968: 171). When the dock was partially filled in 1728/9 to create new land, it was likely accomplished over a short period through a community contributing its daily trash to the dock. Therefore, the faunal remains from Faneuil Hall potentially represent the domestic trash and eating habits of the local Boston neighborhood, as well as refuse from Boston butchers.

This use of local domestic trash as a landfill source became less tenable during the 19th century as people linked foul odors and rotting organic material, such as animal remains, to disease and bad health (Seasholes 1998, Haglund 2003). Materials for landfill shifted away from a community's domestic trash to more "clean" fill free of organic matter, such as gravel, dirt, cellar dirt (taken from excavation during construction of a new building), coal ash, and dredged material (Seasholes 2003: 17). But even with the beliefs regarding public health and disease, domestic refuse was still used as a landfill source because of its omnipresence and convenience; you can always find trash.

To that end, Joan Geismar (1987) compared 18th-century landfill to 19th-century fill in New York City to see if the 19th-century ordinances regarding health and sanitation influenced landmaking activities. She found that the earlier fill (from 175 Water Street) contained much more refuse, including leather scrap and animal bone, but the 19th-century fill was not completely clean: it contained a cache of animal bones and domestic trash that seem to indicate some illegal dumping was done (Geismar 1987). Similar results were found at Boston's Mill Pond, which was filled in the early 19th century by the Boston Mill Corporation. Rather than the "clean gravel or earth" (Seasholes 1998: 131), the fill source

required by contemporary 19th-century contracts, archaeologists at the Mill Pond site found that although the majority of fill at the Mill Pond site was clay, there were still some layers that contained domestic trash. Seasholes posits that the use of different kinds of fill at Mill Pond was a result of the expense of buying and carting “clean” gravel from nearby Beacon Hill (1998: 134).

Many researchers have also focused on what landfill contexts can tell us about a city’s changing landscape. Although greatly constrained by their salvage operation, archaeologists involved in the Bostonian Hotel site found two distinct filling periods: one a gradual accretion of fill over the late 17th and early 18th centuries, and the other a much quicker deposition in the later 18th century when the construction of Long Wharf would have rendered the dock obsolete (Bradley et al 1983, Kelso and Beaudry 1990). The Mill Pond site represents another study of changing land use in Boston. Originally a cove within the Charles River estuary, the Mill Pond was created through “filling, dredging, and excavating in order to create a system of tidal mills, which included grist, saw, and in the late 18th century, chocolate mills” (Balicki 1998: 100).

In an attempt to relate landfill contexts to larger scale issues, several researchers have included landfill in their studies of environmental change over time. Kelso and Beaudry (1990), for example, document the shifting land use at the Bostonian Hotel site through pollen analysis. Similarly, Rothschild and Balkwill (1993) discuss how increased landfiling around New York City altered many animals’ natural habitats, influencing the overall diet of the city.

In terms of this present study of Faneuil Hall, we can see that the filling in of the Town Dock was part of the larger push in Boston towards the creation of new land. The fill

material was likely from local sources: shop owners, residents, and the town's sanitation system, and is thus a glimpse into the everyday lives of the nearby population—
unfortunately, unlike some other archaeological landfill and wharf sites, the Faneuil Hall collection does not allow for an intra site chronological comparison to study environmental and dietary changes over time. From historical documents we know that portions of the dock were filled in at different points throughout the 18th century, but that was not discernible in the archaeology record. However, by focusing on a specific artifact class, faunal remains, this present analysis can contribute to our understanding of landfill as a community midden that represents everyday activities.

Archaeology at Faneuil Hall

Areas around and underneath Faneuil Hall were first excavated in 1990 to assess the impacts of construction within the basement and the addition of a chilled water line. The archaeological work was conducted by Louis Berger and Associates (LBA) for the National Park Service Denver Services Center. The goal of the excavation was to “to determine whether or not strata and features beneath the basement floor remain significant despite previous disruptions,” and to provide dates for the landfill and see if there were differences in the dates and types of fill under the northern and southern half (LBA 1999: IV-7). In 1805 and 1806, a northern addition to Faneuil Hall was constructed, and a basement was excavated under the entire building (LBA 1999). The archaeologists placed several test units in different areas within the basement in order to compare the fill beneath the original building and the later extension, and while the fill appeared highly variable between units, datable artifacts between the north and south sections of Faneuil Hall demonstrate that the fill was

contemporaneous (LBA 1999). This may support Seasholes' (2003) idea that all of land under the present-day Faneuil Hall had been filled in during 1728/1729.

Treating the assemblage as an “expression of community patterns,” the researchers expected the material to reflect the range of animals and meat cuts that were available in the market, and potentially the dietary habits of surrounding households of varying status (LBA 1999: IX-15). For the faunal analysis, all the different proveniences underneath Faneuil Hall were lumped together and the assemblage was made up of 60% mammal, 27% bird and 13% fish (LBA 1999). As mentioned previously, the researchers attempted to distinguish between domestic, commercial, and butchery waste within the faunal assemblage and found examples of all three categories, with dietary refuse being the majority. Contrary to expectations, the researchers found that “the Faneuil Hall assemblage contained a relatively restricted range of animals” especially in comparison with assemblages from New York City (LBA 1999: IX-15). They posit that these differences result from what was being offered to the urban consumer in the market rather than environmental or social differences (LBA 1999).

In 2010, additional archaeological excavations were initiated at Faneuil Hall for the construction of an expanded visitor center and transportation hub. Part of this project undertaken by the National Park Service was the installation of a stairway on the northern side of Faneuil Hall, in order to provide access to the lower level. The stairway's footprint was subject to an archaeological excavation prior to its construction. The project was overseen by URS archaeologists, who conducted the majority of the excavation and documentation of the project. The Fiske Memorial Center for Archaeological Research was brought on to conduct the environmental archaeological analysis and numerous graduate

students from the Historical Archaeology program at the University of Massachusetts Boston assisted during fieldwork in sampling and screening.

The original excavation area was constricted by numerous factors: a historic stone stairway in the eastern portion, a historic structure and modern utilities in the northern portion, and other utilities in the southern portion. The final footprint of the investigation was limited to 7 feet north/south by 8 feet east/west and the excavation was terminated at 11 feet below ground surface. The modern surface cobbles were lifted, which exposed a thick concrete pad that had to be removed with a jackhammer, chisels and breakerbars (called Stratum 1). Beneath the concrete was modern fill (Stratum 2) which was not screened and was discarded. After Strat 2 was removed, an 8 by 8 foot aluminum shoring box was installed into the area. The excavation area was then divided into quadrants, each measuring 4 feet square. Beginning with Strat 3, the excavation was conducted with shovels and trowels, in arbitrary 20 centimeter levels. Excavated soil was lifted out in buckets and water screened through ¼ inch mesh. Although this screening method may have impacted the number of smaller specimens recovered from Faneuil Hall, overall the high numbers of recovered, intact bird and small mammal remains indicate that the ¼ inch screen was sufficient. Environmental archaeology was an important aspect of this investigation: the Fiske Center students took 2 liter flotation sample from every level, a liter sample from each level for insect analysis, and a 30 gram pollen sample from every stratum.

From the field documentation and artifact catalog provided by URS, there appear to be several distinctive types of fill underneath Faneuil Hall. Several of the strata had very low artifact densities, but here I have specifically highlighted the strata that I viewed as the most distinct in terms of soil composition and artifact assemblage: Strats 3, 5, 6, and 10. An

analysis of their individual artifact assemblages and characteristics can give us more information about the site as a whole and will assist later in this paper in determining how to treat the overall faunal assemblage.

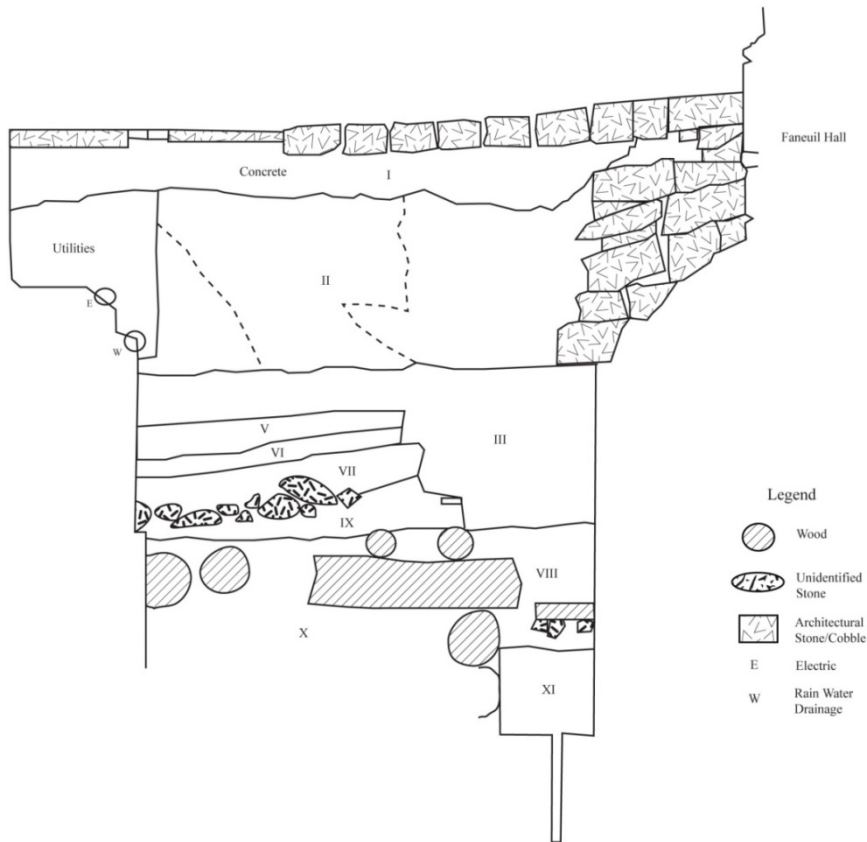


Figure 4: Profile of East Wall of the Excavation Unit.

Strat 3 was the first historical fill context encountered underneath the modern fill. According to the preliminary URS report, Strat 3 “consisted of 10YR3/2 very dark grayish brown sandy loam with pockets of 10YR2/1 black sandy loam and 5Y4/3 olive clay, and yielded a mixed assortment of artifacts that ranged in manufacture from the late seventeenth century through the eighteenth century” (URS 2010: 10). At first, it was present throughout the entire excavation unit, but the deposit was much thinner in the Northern half and went to

the depth of 8.9 feet in the Southern half. URS archaeologists postulated that Strat 3 may be the result of infilling from the construction of the addition to Faneuil Hall in 1805 and 1806, with this strata's parallel orientation to the foundation of the building potentially representing a builder's trench (URS 2010: 10). Strat 3 appears to be similar to the thick fill deposits found by Louis Berger and Associates (LBA) in several of their test units during their excavation at Faneuil Hall in 1990.

Strat 3 yielded 2882 artifacts, approximately 42% of the entire collection from Faneuil Hall. The majority of this assemblage consisted of ceramics (N = 1507) and glass fragments (N = 794), which contrasts with other fill episodes present at Faneuil Hall. A Mean Ceramic Date (MCD) was calculated and produced an average of 1743 for the entire strata. The ceramic assemblage is very impressive in its variety, containing British buff-bodied slipware, redware, porcelain, creamware, Jackfield type, Midlands mottled, pearlware, tin-glazed, Nottingham ware, Westerwald, and numerous types of salt-glazed stoneware. Overall, the assemblage from Strat 3 appears to represent household refuse from the Boston community.

If we think of Strat 3 as 18th-century fill that was potentially re-deposited during the early 19th-century construction around Faneuil Hall, this helps explain the presence of certain ceramic outliers, such as pearlware and a 19th-century porcelain button. The 71 pieces of creamware and 12 pieces of pearlware may have been more contemporary trash that was added to the older fill during that later construction. If these ceramics were removed from the assemblage, the MCD would be much earlier than 1743 and would coincide with the historical date for the filling in of Faneuil Hall. The deep fill deposits found by LBA in the basement of Faneuil Hall produced artifacts that also spanned the 17th to 18th centuries.

Interestingly, in Strat D of their Test Unit 6 in the SW corner, they found later 18th century material (creamware, pearlware, whiteware) that they also believed to indicate either disturbance or re-deposition (LBA 1999: V-23).

Strata 5 and 6 were only present in the northern two-thirds of the unit. Strat 5 was beneath Strat 3 and “consisted almost entirely of brick demolition debris with 10YR4/3 brown sand containing dense brick fragments and brick dust” (URS 2010: 12). It was a thin layer that was followed by Strat 6: “2.5Y2.5/1 black sandy loam with dense ash and charcoal” (URS 2010: 12) According to the URS fieldnotes and report, these two strata likely “represent a historical burning episode,” possibly the 1761 fire that destroyed part of the southern section of Faneuil Hall, so I decided to treat them as a single context. A similar stratum of ash and building rubble was also found in many of the units excavated by LBA in 1990.

A total of 1472 artifacts were recovered from Strata 5 and 6, or 21.6% of the total assemblage. Unlike Strat 3, glass fragments were the most prevalent artifact, followed by ceramics, and metal objects; although there was the same impressive array in ceramic type. The mean ceramics date for these two strata was 1731. Notable ceramics include two fragments of Clouded Ware, which have a tight date range of 1740 to 1770. In contrast with Strat 3, we see much more building materials and construction refuse in this context, including window glass (N = 168), nails (N = 217), plaster (N = 20), mortar (N = 31), and brick (N = 25). The smaller number of brick fragments may be the result of a sampling method and may not reflect all that was seen in the field.

Towards the base of the excavation unit, the archaeologists uncovered at least four layers of horizontal logs, each of which ran perpendicular to the one above along a southeast-

northeast axis. The archaeologists determined that these logs representing the wooden cribbing from when the Town Dock area was originally wharfed out in the 18th century (URS 2010: 12). This may parallel what was found by LBA in 1990: their excavation unit 1, in the SE corner of the building's basement, found wooden planks and logs in Stratum F, which yielded a mean ceramic date of 1724 (LBA 1999). Although the extensive cribbing in the unit limited the amount of excavation, a number of artifacts came from the soil between the timbers, which was designated as Strat 10. According to the URS Management Summary, Strat 10 consisted of "10YR3/1 very dark gray highly organic silt loam with charcoal and pockets of Gley 1 5/5GY greenish gray clay....number of seventeenth-century belly bowl pipes, early stoneware, imported coral, and possible stone ship's ballast" (12). The base of this stratum could not be defined due to the continuing cribbing.

A total of 989 artifacts were recovered from the soil between the timbers, 14% of the overall assemblage. The materials used to create this fill deposit contrast with the other strata underneath Faneuil Hall. Although ceramics are the most frequent artifact class encountered (N = 450), over half of the ceramics were pipe fragments, the majority of the rest being redware or tin-glazed. A MCD was calculated for this layer and yielded a date of 1725. In contrast with the other strata, Strat 10 contained 112 fragments of coral and 158 fragments of ballast flint, both English and French. This amount of ballast flint and imported coral may indicate that Strat 10 contains the remains from when the area still functioned as a dock, it may predate the landmaking activities to create Faneuil Hall.

The presence of ballast flint is mirrored at contemporary archaeological sites in Boston. In his discussion of the Mill Pond site, Balicki states, "the presence of flint nodules within early deposits is of interest. The flint is European in origin, probably transported as

ballast, and comprises over a quarter of the artifacts from the earliest two phases at the site” (1998: 109). High concentrations of flint were also recovered from the initial occupations from the Paddy’s Alley and the Cross Street Back Lot sites (Balicki 1998). Balicki posits that “the dumping of flint ballast upon the isthmus was probably a common occurrence during the late 17th through 18th centuries, but by the mid-18th century, the process appears to have stopped once the isthmus began to be intensely settled” (1998: 109).

Underneath Faneuil Hall is a complex series of strata that potentially represent the daily refuse of a Boston community. Several of the strata contain material that appear to be very distinct and may indicate different activities that went towards creating the fill within the Town Dock. The analysis of the faunal assemblage from the 2010 Faneuil Hall assemblage represents an opportunity to better understand site formation processes and possible sources of the landfill.

CHAPTER 3

ZOOARCHAEOLOGICAL METHODS AND RESULTS

Methods

The 2010 excavation at Boston's Faneuil Hall recovered a significant quantity of faunal remains, leading to this present analysis. Thorough methods employed in the field and the laboratory have ensured the accurate and comprehensive collection of data, interpretations of which can provide a better understanding of 18th-century foodways in Boston and the relationship between the city's diet and the developing urban market system, as well as insights into depositional processes at Faneuil Hall.

Laboratory Methods

All excavated artifacts were delivered to the Boston City Archaeology Lab at the end of each workday. The City Archaeology Lab's staff, along with additional graduate students from the Fiske Center, immediately began the preliminary processing of artifacts. There the Faneuil Hall artifacts were washed or dry brushed when appropriate, sorted, and each artifact class was bagged separately within each context. The preliminary inventory concluded, the materials necessary for environmental archaeology (flotation samples, insect sample, pollen

samples, faunal remains), as well as the materials needing conservation, were brought to the Fiske Center. The rest of the archaeological artifacts were catalogued at the URS laboratory in Lowell, MA.

When the materials arrived at the Fiske Center, the bags containing faunal remains were removed from the overall collection, logged out, and taken to the Zooarchaeology Laboratory. The entire faunal collection was then analyzed by the author under the direction of Dr. David Landon. The analytical and recording methods and procedures used in the UMass Boston zooarchaeology lab ensure that accurate data are produced and that comparison to other faunal assemblages from archaeological sites is possible. Each specimen was assigned a number and the following data were recorded: provenience, quantity, class, taxon, body part, element portion, fusion state of proximal and distal ends, symmetry, weight, and classifications regarding taphonomy: weathering, burning, butchery, and rodent or carnivore gnawing. The butchery marks include cut marks, chop marks, shear marks, and saw marks, as defined by Crader (1984) and Reitz and Wing (1999). Butchery marks found on mammal bones were then recorded on line drawings adapted from Hemler (1987) in order to better understand any pattern or distribution. Several texts were used to assist in element and species identification, including Hillson (1986, 1992) for mammals, Cannon (1987) for fish, and Cohen and Serjeanston (1986) for birds. However, much of the identification was achieved through the use of the Fiske Center's extensive zooarchaeological comparative collection.

For each context, the faunal material was separated into taxonomic classes: mammal, bird, fish, and bivalves, and then into elements and size categories. When the specimen could not be attributed to a particular taxon, higher classification categories were used,

following Landon (1996). In the case of mammal remains, these were small mammal (rabbit and smaller), medium mammal (larger than a rabbit but smaller than a large pig), and large mammal (bigger than a larger pig). If a higher class could not be determined, the specimen was recorded as unidentified mammal or other. Similar methods were used for the other classes of animal.

Analytical Methods

The data were entered into an Excel spreadsheet for further sorting and data analysis. Mammal teeth were separated for further examination, and various sorting methods were used in order to separate out any potential issues within the faunal material. The overall assemblage was then analyzed by stratum and correlated with artifact data provided by the URS catalogue. Sorting this way allowed for a better understanding of the depositional history at the site and the nature of the faunal remains.

In order to better understand the overall composition of the faunal assemblage, several different analytical methods concerning relative frequency of specimens were utilized and compared. The NISP, or number of individual specimens, within the assemblage is the sum of all specimens from a given taxonomic level. It is a way to compare frequency of specimens across different classes and is used to extrapolate the relative importance of a species within the overall assemblage (Reitz and Wing 1999). There are several problems with relying solely on a NISP count. For example, there is an inherent assumption that recognition and fragmentation are uniform for all taxa (Reitz and Wing 1999). In addition, cultural processes, non-human taphonomic agents, and archaeological recovery techniques can all create biases within the specimen count (Reitz and Wing 1999). For these reasons,

NISP is best used in conjunction with other forms of quantification, such as MNI, Biomass, and skeletal part frequency.

The MNI is the minimum number of individuals present in the assemblage. It is defined as the smallest number of individuals that is necessary to account for all skeletal elements of a particular species at a site (Reitz and Wing 1999). For this study, the MNI was calculated by examining the most frequent body part and took into account symmetry within the assemblage, or the frequency of right or left elements within the taxonomic class. The MNI is chiefly an analytical product, and must be understood as such. It is likely that more actual individuals might have been present at the site, or that specific portions of the animals were used over and over again, inflating the potential MNI (Reitz and Wing 1999).

Biomass is derived from a mathematical formula that is based on an observed allometric relationship between skeletal weight and overall animal weight (Landon 2005). The formula for calculating biomass is as follows: $\text{biomass (kg)} = \log a + b \cdot \log[\text{bone weight (kg)}]$, where 'a' and 'b' are known constants based on observations of different classes, families, and species of animals, and the bone weight is the total of the weight of a particular class, family, or species in the archaeological collection (Reitz and Wing 1999: 222-225). Although this method is derived from a formula rather than observation, it has its drawbacks. First, it is only applicable to vertebrate classes, so shellfish were not included. Second, calculating biomass is not equivalent to calculating the actual weight of the individuals in the faunal assemblage. Like MNI and NISP, biomass serves as a proxy for understanding the dietary contribution of animals.

Finally, skeletal part frequency, done in the form of percentages of overall NISP, was completed for each taxon in order to gain more information regarding butchery patterns, meat

cut preferences, and also determining if the faunal remains were from domestic activities or commercial ones.

Results

Taphonomy

Zooarchaeologists must critically examine the processes that can affect preservation at an archaeological site in order to distinguish human and cultural forces from those that can be attributed to non-human factors (Reitz & Wing 1999). This study of taphonomy helps us understand how the archaeological assemblage was deposited and what potential biases may be present.

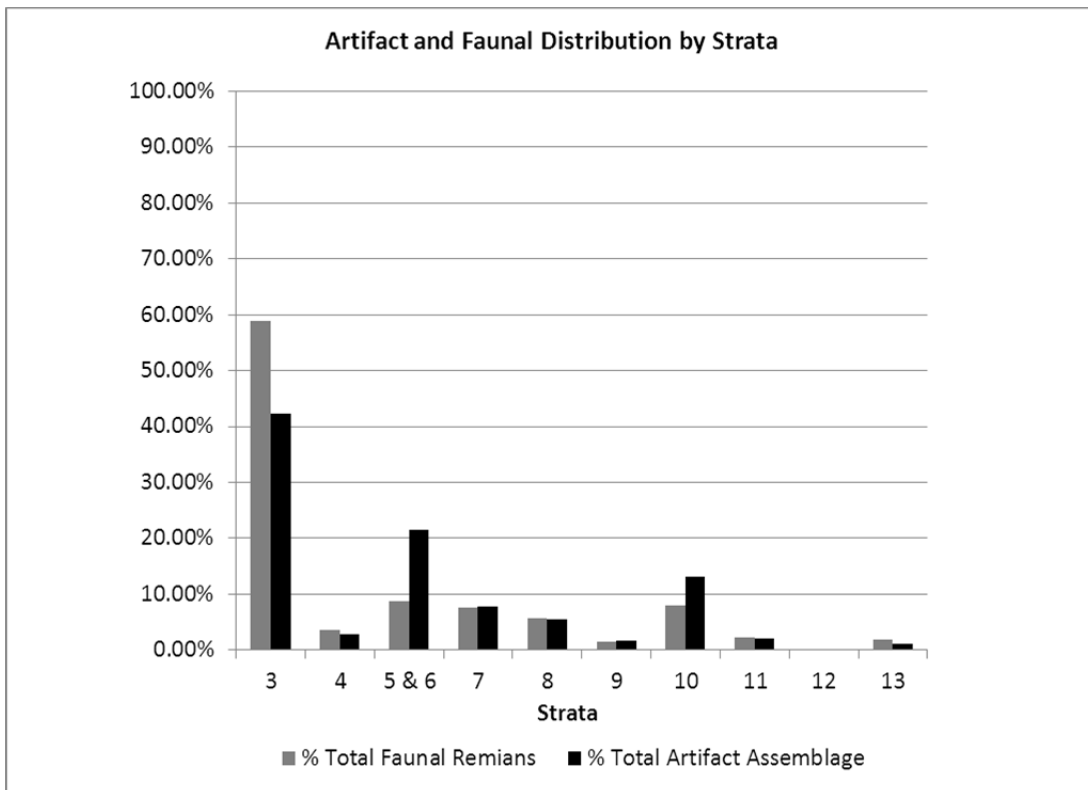


Figure 5: Artifact and Faunal Distribution by Strata.

We know that the Town Dock was gradually filled and altered throughout the 18th and 19th centuries, and earlier I discussed how there were several distinctive types of fill underneath Faneuil Hall in terms of artifact assemblages and soil composition. However, it is necessary to determine if there are enough differences between the strata to allow for a comparison, or if the strata, while different, were all deposited in the same manner and should be treated as one large fill episode.

To explore possible differences in deposition, the faunal assemblage and artifact assemblage were split up by strata and then compared as percentages of the whole (Figure 5). If the nature of the deposits underneath Faneuil Hall changed significantly over time, or if different activities were going towards creating the fill, we would expect to see variations between the percentages of faunal remains and artifacts in the different strata. Strata 3, 5/6, and 10 respectively contained the largest proportions of both artifacts and faunal remains. While Strata 3 does contain proportionally more of the total faunal assemblage, overall the pattern for the two material classes are similar throughout the entire deposit. This supports the idea that the artifacts and the faunal remains followed similar depositional pathways into the fill.

Since Strata 3, 5/6, and 10 contained the largest concentration of faunal remains and had very different artifact assemblages, I separated these three layers to see if intra context comparisons were possible. The total NISP was calculated for each of the strata under observation and then further divided up into taxonomic classes and skeletal part representation for each of the three major mammal groups (Pig, Caprine, and Cattle). These numbers were then compared with those from the entire faunal assemblage to determine if there were any anomalies.

The overall taxonomic representation was very similar across all of the contexts: the categories of Medium and Unidentified Mammal were the most frequent, and amongst the three lower taxonomic classes sheep were the most prevalent, followed by cattle and pig. When the skeletal part frequencies of each of the three major mammal species were compared, the overall composition of the three strata and the site as a whole appeared to be very similar. For cattle (Figure 6), the large number of loose cattle teeth in Strat 10 in comparison with the other strata at first seems to be an anomaly, but this and other slight differences between the percentages can be attributed to skewing that resulted from the large number of specimens present in Strat 3 and the much smaller assemblages from the other two strata. The percentages for each body part are different between the strata, but they follow the overall pattern of the collection.

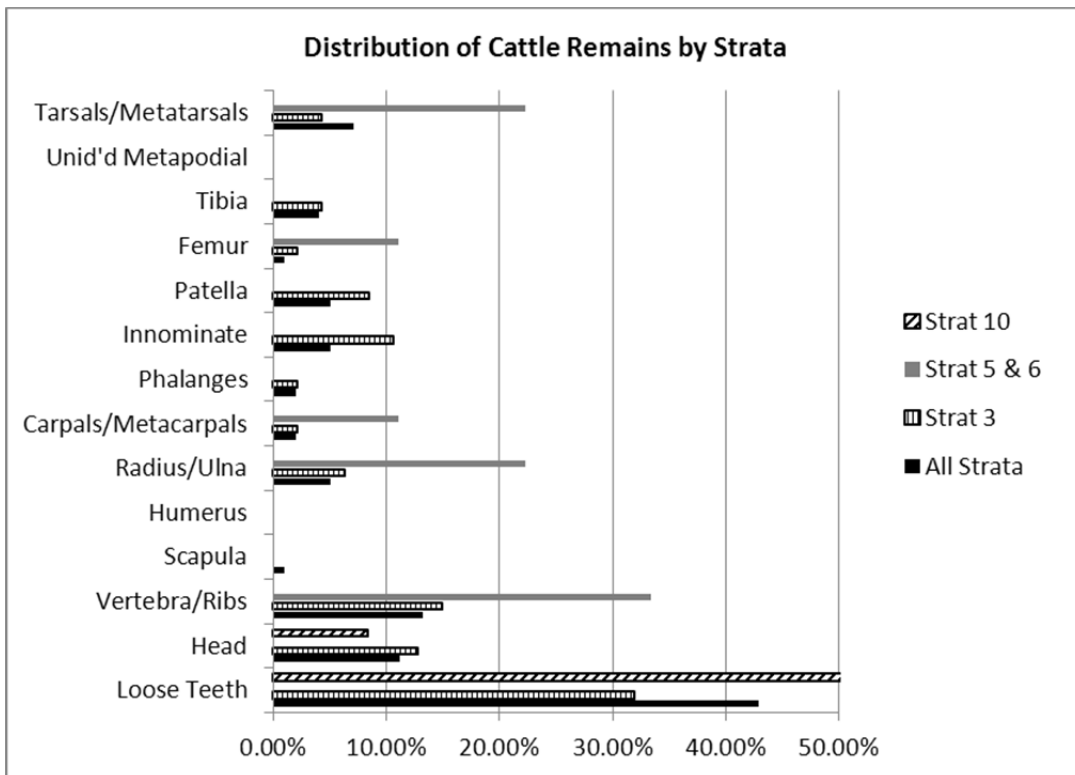


Figure 6: Distrubution of Cattle Remains by Strata.

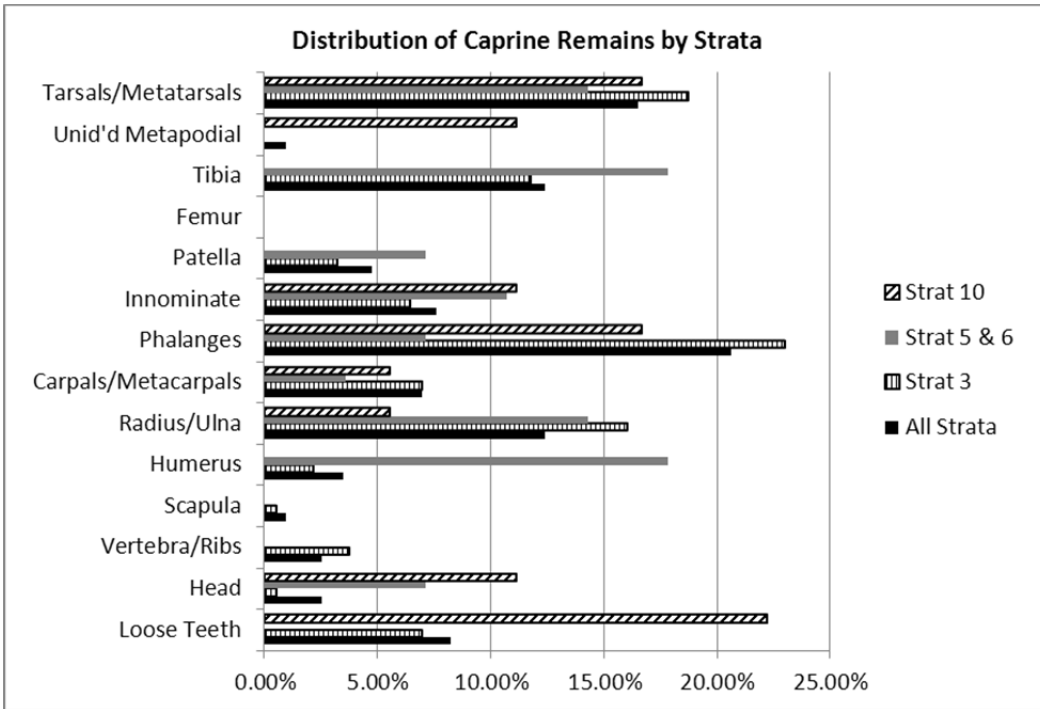


Figure 7: Distribution of Caprine Remains by Strata.

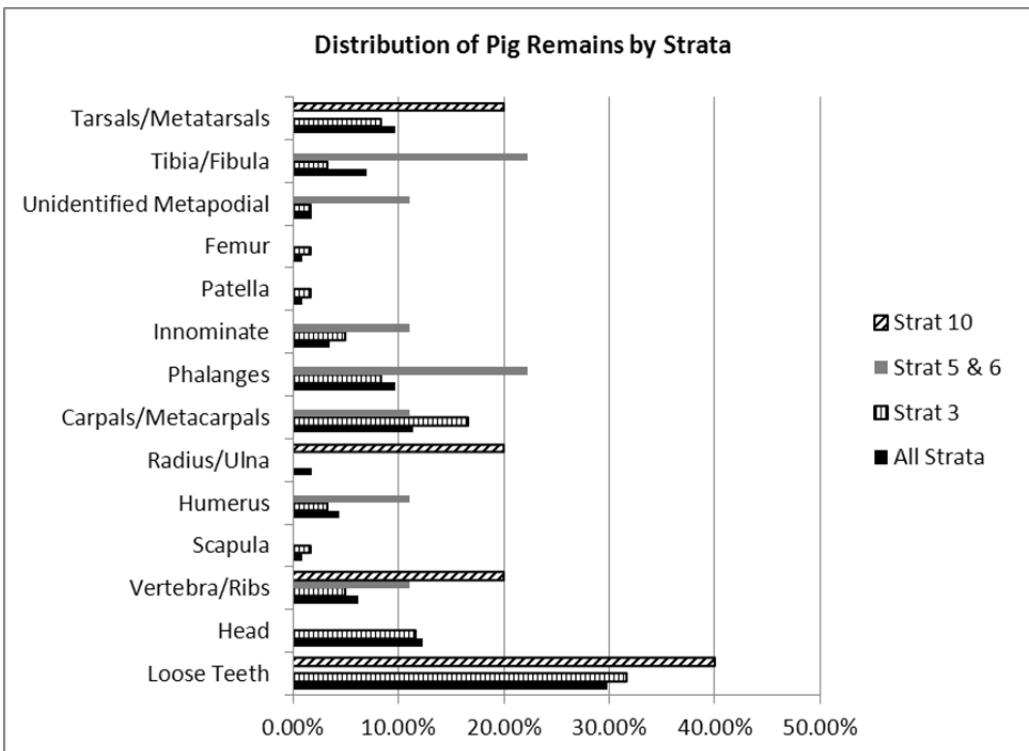


Figure 8: Distribution of Pig Remains by Strata.

As discussed in Chapter 2, Strats 3, 5/6, and 10 each had distinctive artifact collections. While these differences may merit further discussion, as they appear to indicate different activities that went into the creation of the fill under Faneuil Hall, it was determined for this present project to treat the faunal assemblage as a whole rather than dividing it up. The fact that the majority of the faunal material is present in a single stratum makes intra site comparisons more than slightly tenuous. In addition, as it is likely that bulk of the material underneath Faneuil Hall was deposited over a short period of time (and potentially later re-deposited in 1805-06), further division would not be of any use to chronological comparisons.

Taphonomic Factor	Cattle	Caprine	Pig	Small Mammal	Medium Mammal	Large Mammal	Unidentified Mammal	Bird	Bivalves	Gastropod	Fish	Total
Burned Specimens	0	3	2	8	223	0	110	25	11	0	0	382
% of NISP	0.0%	0.9%	1.8%	19.5%	14.8%	0.0%	16.3%	6.2%	1.5%	0.0%	0.0%	9.1%
Rodent Gnawing	2	13	0	0	13	2	4	1	0	0	0	35
% of NISP	2.0%	4.1%	0.0%	0.0%	0.9%	1.7%	0.6%	0.2%	0.0%	0.0%	0.0%	0.8%
Carnivore Gnawing	0	8	0	0	14	1	0	0	0	0	0	23
% of NISP	0.0%	2.5%	0.0%	0.0%	0.9%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%

Table 1: Surface Modifications Observed on Bones. NISP= number of identified specimens.

The Faneuil Hall faunal assemblage was also analyzed for indications of weathering, burning, rodent and carnivore gnawing, and any other taphonomic factors, the results of which are presented in Table 1. Weathering occurs when bones are left in open areas and are subjected to shifts in the weather conditions (Reitz and Wing 1999: 139). Its effects can be “cracking, splitting, exfoliation, disintegration, and decomposition,” of the bone’s surface (Fisher 1995: 31). Fortunately, weathering was not a potential bias within this assemblage as the remains at Faneuil Hall were rapidly deposited and capped soon after. The heavy water

logged conditions at the site also ensured that the faunal remains were well preserved. Since there were no specimens with evidence of weathering, it is not featured in Table 1.

The factor that affected the largest number of specimens within the assemblage was burning, with 382 specimens, or 9% of the total, exhibiting evidence of burning. The majority of the burned specimens fell within the Medium or Unidentified Mammal category. The burning of bones changes their physical appearance, leaving them more fragmented, cracked, and often shrunken from their original size, so it can frequently prevent complete identification of the element and the species (Reitz & Wing 1999). These burned specimens may be related to either food preparation or the disposal of food remains in fires or hearths (Landon 2002: 355).

Less than 1% of the assemblage had any indication of rodent or carnivore gnawing, which indicates that the faunal remains were not easily accessible to scavengers. This lack of gnawing also suggests a quick deposition; this was not refuse that had been laying exposed; it was likely created at the time of the filling. The largest taphonomic concern within this assemblage resulted from the actual archaeological excavation rather than historic depositional processes. As the excavation was done with both hand trowels and shovels, many of the bones exhibited fresh breaks, some of which mimicked butchery marks (Fisher 1995). Although modern markings were seen on many of the specimens, it generally did not prevent identification of the element or its assignment to a species category. Collection and curation damage were recorded in the Notes section of the catalog for each element.

Butchery Marks	Bos	Caprine	Sus	Medium Mammal	Large Mammal	Unidentified Mammal	Bird	Fish	Total
Cut	6	18	13	11	3	2	3	2	58
Chop	1	20	1	2	0	1	0	1	26
Spiral/Green Fracture	1	11	0	1	0	0	0	0	13
Shear	14	16	3	64	13	13	0	0	123
Saw	0	0	0	0	0	0	0	0	0
Total # of Marks	22	65	17	78	16	16	3	3	220
Total # of Butchered Specimens	21	48	11	76	16	16	3	2	193
NISP	99	317	114	1508	118	675	399	180	3603
% Butchered	21.2%	15.1%	9.6%	5.0%	13.6%	2.4%	0.8%	1.1%	5.4%

Table 2: Butchery Marks Observed on Bones.

Additional surface modifications in the form of butchery marks were present on 193 specimens, or 5.4% of all specimens (not including the shellfish specimens), and these consisted of 58 cut marks (straight and narrow incised lines), 26 chop marks (instances where small wedges of bone were removed), 13 spiral or green fractures (a curved break often accompanied by a chop), and 123 shear marks (cases where the bone was chopped clean through) (Landon 1996: 59). For more information on the placement of these marks on the major mammal species, please see Appendix A. Of the specimens displaying butchery marks, 97% were mammals, 2% were birds, and 1% fish. The butchery marks present on the domestic animal bones reinforce the idea that the specimens are largely the result of food trash. The nature and placement of the butchery marks is discussed in greater detail for each taxon below.

The lack of weathering and the small number of specimens with rodent and carnivore gnawing indicate that the Faneuil Hall collection was largely undisturbed after it was deposited. We know from historical documents and maps that the area underneath the present building was gradually filled in, with a push occurring from June 1728 to February 1729 (Seasholes 2003), and that the original Faneuil Hall was constructed on top in 1742. If

disturbance and re-deposition occurred with the 19th-century construction, the overall integrity of the faunal collection was not affected.

Taxonomic Representation

The faunal assemblage recovered from Faneuil Hall consisted of 4213 specimens with a combined weight of 17,837.6 grams. Because of the well-preserved nature of the assemblage, the majority of the specimens were identified to at least the level of a taxonomic class or general animal size.

Mammals represent the majority of the assemblage with 2872 specimens, or 68.2% of the total. Unidentified mammals account for 675 specimens (23.5% of the mammal assemblage). The identified mammal assemblage is dominated by cattle, pig, and sheep/goat, as well as bones from unspecified medium (52.5 % of the mammals) and large mammals (4.1% of the mammals). The majority of the specimens placed in size categories fell into parts of the body that, when fragmented, are difficult to attribute to a particular species: vertebrae (N = 235), ribs (N = 356), and unidentified long bones (N = 831). The Medium Mammal fragments likely correspond to either pig or caprine individuals, and the Large Mammal fragments to cattle. The specimens that fall into categories other than the three mentioned above were of such a fragmentary nature that it was often impossible to place them in a lower taxonomic group. Additionally, many of the specimens of the appendicular skeleton are unfused epiphyses that are physically similar between taxonomic classes.

Caprines (*Capra hircus/Ovis aries*) were the most common domestic mammal recovered at Faneuil Hall, comprising 317 specimens (7.5% of the assemblage total) and weighing 2466.9 g (13.8%). A species determination was not possible, as sheep and goats

have similar skeletal morphology, so the broader category Caprines was used. A MNI of 16 was calculated based on the 39 tibiae specimens present in the assemblage. Pig (*Sus scrofa*) remains were the second most common, with a total of 114 specimens (2.7%) and 921.1 g of weight (5.2%). A MNI of 2 pigs was calculated from the presence of 2 left distal tibiae and 2 left ulnae. The NISP for cattle (*Bos taurus*) was 99, or 2.3% of the total assemblage. A MNI of 2 was calculated based on the repetition and symmetry of limb bones. Though a small number of cattle were present in the assemblage, these specimens represent 2339.2 grams (13.1%) of the assemblage weight. Small mammals make up a small percentage of the assemblage (<1%), the majority of which were not identified to a species. The three identified species (dog, cat, and rat), each had an MNI of 1 and likely do not represent food waste.

Classification	Common Name	NISP		WT		MNI		Biomass	
		NISP	%	g	%	N	%	kg	%
<i>Bos taurus</i>	Cow	99	2.3%	2339.2	13.1%	2	2.5%	21.9	18.6%
<i>Ovis aries/Capra hircus</i>	Sheep or goat	317	7.5%	2466.9	13.8%	16	19.8%	23.0	19.5%
<i>Sus scrofa</i>	Pig	114	2.7%	921.1	5.2%	2	2.5%	9.5	8.0%
<i>Canis familiaris</i>	Dog or wolf	4	0.1%	9.1	0.1%	1	1.2%		
<i>Felis familiaris</i>	Cats	4	0.1%	2.2	0.0%	1	1.2%		
<i>Rattus spp.</i>	Small Rodent	10	0.2%	2.1	0.0%	1	1.2%		
Small mammal		23	0.5%	11.6	0.1%			0.2	0.2%
Medium mammal		1508	35.8%	3043.4	17.1%			27.7	23.6%
Large Mammal		118	2.8%	2269.7	12.7%			21.3	18.1%
Unidentified mammal		675	16.0%	990.5	5.6%			10.1	8.6%
Total Mammal		2872	68.2%	12055.8	67.6%	23	28.4%	113.6	96.7%
<i>Anas sp.</i>	Duck	21	0.5%	24.7	0.1%	4	4.9%	0.3	0.3%
Anserinae	Geese	5	0.1%	9.7	0.1%	2	2.5%	0.1	0.1%
Columbidae	Pigeon or rock dove	82	1.9%	14	0.1%	7	8.6%	0.2	0.2%
<i>Gallus gallus</i>	Chicken	39	0.9%	46.4	0.3%	4	4.9%	0.5	0.5%
<i>Melagris gallopavo</i>	Turkey	9	0.2%	16.4	0.1%	2	2.5%	0.2	0.2%
Phasianidae	Pheasants, quail	4	0.1%	1.7	0.0%			0.0	0.0%
Tetraonidae	Grouse	10	0.2%	5.9	0.0%	2	2.5%	0.1	0.1%
Small bird		15	0.4%	2.7	0.0%			0.0	0.0%
Large bird		3	0.1%	1.4	0.0%			0.0	0.0%
Unidentified bird		215	5.1%	94.6	0.5%			1.0	0.9%
Total Bird		403	9.6%	217.50	1.2%	21	25.9%	2.6	2.2%
<i>Acipenser sp.</i>	Sturgeon	1	0.0%	10.40	0.1%	1	1.2%	0.1	0.1%
Gadidae	Cods, hakes, haddocks	36	0.9%	32.9	0.2%			0.3	0.3%
Melanogrammus aeglefinus	Haddock	5	0.1%	17.3	0.1%	2	2.5%	0.2	0.2%
Salmonidae	Salmon, trout, whitefish	11	0.3%	5.3	0.0%	1	1.2%	0.1	0.1%
Serranidae	Sea basses	8	0.2%	4.6	0.0%	1	1.2%	0.1	0.1%
c.f. Scombridae	Mackerel, tuna, bonitos	1	0.0%	0.1	0.0%	1	1.2%	0.0	
c.f. Pleuronectiforms	Flatfish	1	0.0%	0.2	0.0%			0.0	
Unidentified Fish		118	2.8%	49.2	0.3%			0.5	0.4%
Total Fish		181	4.3%	120	0.7%	6	7.4%	1.3	1.1%
<i>Aequipecten irradians</i>	Scallop	1	0.0%	1.5	0.0%				
Anomidae	Jingle shell	4	0.1%	2.6	0.0%				
<i>Crassostrea virginica</i>	Eastern oyster	554	13.1%	5249.8	29.4%	11	13.6%		
<i>Crepidula fornicata</i>	Slipper shell	2	0.0%	2.3	0.0%				
<i>Geukensia demissa</i>	Atlantic ribbed mussel	5	0.1%	7.8	0.0%				
<i>Macoma sp.</i>	Macoma clam	10	0.2%	2.5	0.0%				
<i>Mercenaria mercenaria</i>	Nothern quahog	4	0.1%	31	0.2%	3	3.7%		
<i>Modiolus sp.</i>	Horsemussels	7	0.2%	2.9	0.0%				
<i>Mya arenaria</i>	Soft shell clam	23	0.5%	32.7	0.2%	17	21.0%		
<i>Mytilus edulis</i>	Blue mussel	7	0.2%	3.7	0.0%				
Unidentified bivalve		115	2.7%	92.2	0.5%				
Unidentified gastropod		25	0.6%	15.3	0.1%				
Total Shellfish		757	18.0%	5444.3	30.5%	31	38.3%	0.0	0.0%
Total		4213	100.0%	17837.6	100.0%	81	100.0%	117.5	100.0%

Table 3: Taxonomic Representation. NISP = Number of Identified Specimens, MNI = Minimum Number of Individuals.

Bird accounted for 403 specimens (9.6%) of the Faneuil Hall assemblage, with a weight of 217.5 g. (1.2%). At least 6 species are present in this collection yielding an MNI of 21, with the potential for both wild and domestic fowl. It is likely that the chickens and turkeys were raised for food, while the duck, goose, pigeon and grouse may have been hunted. The pigeon bones likely belong to *Ectopistes migratorius*, or passenger pigeon, as this bird was a food favorite in colonial America (Landon 1996). However, the bones were placed under the broader category of Columbidae as many within that family share similar morphological features. The amount of unidentified bird bone (215 specimens, 53.3% of the bird assemblage) is due to the presence of long bone fragments that lack any diagnostic feature, being mainly fragments of the diaphysis. The identified limb bones that could not be assigned to a specific family were often of a very fragmentary nature.

The Faneuil Hall assemblage yielded 181 fish specimens (4.3%), accounting for 120.0 g. in weight (<1%), and a MNI of 6 individuals. Identified taxa include the cod family, haddock, salmon family, sea bass, mackerel family, sturgeon family, and flatfish family. The identified fish species were all saltwater food fish that were locally available in the port city of Boston. The majority of the fish bones are vertebrae and ray fragments, with very few head bones present. Unfortunately, the head of the fish contains the more diagnostic elements of the skeleton, so the number of fish species identified is small. There are distinctions in vertebrae between species, but there are also a large variety of vertebral shapes and sizes within a single fish species, so where possible a species was not identified in the assemblage from a single vertebra. An exception was made in the identification of several Salmonidae vertebrae, which are highly unique to that family. The small number of fish bones overall, combined with the small proportion of head elements and high proportion of vertebrae and

rays, suggest these bones are largely food trash from domestic households. Despite the location on the town waterfront, there is no indication of fish bone refuse from commercial fishery activity.

There were 757 shellfish specimens (18%) in the Faneuil Hall assemblage, with a weight of 5444.3 g. (30.5%), representing remains from at least 31 individuals (based on counts of shell hinges). The majority of the shellfish assemblage is made up of edible species (scallop, oyster, hard shell clam, soft shell clam, and mussels), but there are a few (e.g. *Macoma* sp.) that are likely intrusive elements rather than food. There were 25 Gastropod specimens in the collection, most of which were the remains of different kinds of snails. However, due to their fragmentary nature and the highly similar morphology of many snail species, it was difficult to identify the specimens to a lower taxonomic level. Oysters (*Crassostrea virginica*) were by far the most common species found, making up 73.2% of the total shellfish collection. Due to continuous fragmentation, the NISP for oyster is likely inflated, as small pieces, which often retain diagnostic attributes, were counted along with large ones. All of the species identified would have a very wide geographic range, often from Northern Canada to the Southern United States, and are very common in the shallow and intertidal waters around Boston (Gordon and Weeks 1982).

Skeletal Representation and Butchery

One of the questions in dealing with a landfill context is determining where the fill came from, or what kind of activities produced it. Do the remains represent economic activities (such as trade) or are they from the neighborhood's domestic food refuse? Is it possible to distinguish the dietary importance of the different species in the assemblage? In

this section, body part representation and butchery are examined together towards answering the questions above.

The relative frequency of body parts can be affected by numerous factors. In terms of preservation, there is a potential bias towards the more robust elements of the skeleton, as bones such as teeth are more likely to survive taphonomic factors than the delicate bones of a juvenile animal (Landon 1996: 46). Thus, the more fragile elements of the skeleton and juvenile individuals are likely to be underrepresented in the assemblage. With the case of Faneuil Hall, the low impacts of taphonomic processes and the excellent site recovery may counteract some of these biases. Body part representation can also be affected by cultural practices, and it is frequently used as a gage to determine whether or not an animal was killed on site, hypothesized as there being a more complete skeleton present (Brown and Bowen 1998, Crabtree 1990). The frequencies are also influenced by butchery practices, such as the removal of heads or feet, and meat cut preferences.

However, as the site under discussion is a landfill context rather than at the household level, teasing out information regarding where the animals were butchered may be difficult. It is more informative to focus on the possible sources of the faunal remains and what meat cuts are present. This can then later be used in comparison with contemporary archaeological sites in Boston. Fish and shellfish remains were not included in this portion of the analysis, as the majority of the fish remains were loose vertebrae and the shellfish was largely made up of oyster shell and hinge fragments.

Body Part	Cattle		Caprine		Pig	
	NISP	% NISP	NISP	% NISP	NISP	% NISP
Loose Teeth	42	42.4%	26	8.2%	34	29.8%
Head	11	11.1%	8	2.5%	14	12.3%
Vertebra/Ribs	13	13.1%	8	2.5%	7	6.1%
Scapula	1	1.0%	4	1.3%	1	0.9%
Humerus	0	0.0%	11	3.5%	5	4.4%
Radius/Ulna	5	5.1%	39	12.3%	2	1.8%
Carpals/Metacarpals	2	2.0%	22	6.9%	13	11.4%
Phalanges	2	2.0%	65	20.5%	11	9.6%
Innominate	5	5.1%	25	7.9%	4	3.5%
Femur	5	5.1%	15	4.7%	1	0.9%
Patella	1	1.0%	0	0.0%	1	0.9%
Tibia	4	4.0%	39	12.3%	8	7.0%
Tarsals/Metatarsals	8	8.1%	52	16.4%	11	9.6%
Unidentified Metapodial	0	0.0%	3	0.9%	2	1.8%

Table 4: Skeletal Part Representation for Major Mammal Taxa.

Cattle

Loose teeth were the majority of the cattle remains recovered from Faneuil Hall, making up 42.4% of the specimens. This is partly explained by the denser and more compact nature of teeth, which allows them to survive taphonomic processes that other bones cannot. Apart from the loose teeth, the rest of the cattle elements appear to be spread across the skeleton, although there are no specimens of either the humerus or metacarpal present. Overall, the emphasis on limbs and metapodials suggest these are the remains of food waste, including the fore shank (radius and ulna), round (femur, tibia and tarsals), loin, and rib cuts. There is a single unfused horn core in the assemblage, but it does not exhibit any markings that would indicate it being used for any kind of manufacturing. Its presence may instead support the presence of a juvenile in the assemblage.

The idea that these remains represent food or butchery waste is supported by the frequency and location of butchery marks on the specimens. This study follows the division of butchery into primary, secondary and tertiary stages as outlined by Landon (1996: 120).

Primary butchery entails the initial slaughter of the animal, dressing of the carcass and evisceration. Secondary butchery is the division of the carcass into the major portions, and tertiary butchery involves the further division that takes place before the animal is consumed. Of the 99 identified specimens, 21 exhibit some sort of butchery mark (cut, chop, spiral/green fracture, or shear), roughly 22% of the total NISP. The majority of the butchery marks are shears (N = 14) and likely indicate the primary processing of the carcass (Landon 1996). Shear marks represent a straight edge on the bone which is left after being chopped through (Landon 1996: 59). There are several shears present on vertebral centrums, which would result from the carcass being split in half, and there are shears on limb bones as well as two astragali that indicate the further dismemberment of the carcass into roasts and other portions (Crader 1984, Landon 1996). There is also a shear on the inferior surface of the occipital condyles of the foramen magnum, which may indicate the removal of the head from the rest of the body.

Caprines

Unlike the cattle remains, the caprine assemblage is much more skewed to the upper and lower meaty limb elements, with loose teeth making up only 8% and cranial fragments 2.5% of the assemblage. Few caprine vertebrae were identified (N = 8), however this is likely due to the difficulty in distinguishing between vertebrae of similarly sized species. Many of the vertebrae fragments that were identified to the higher taxonomic category of medium mammal probably belong to caprines.

Apart from the large number of phalanges (N = 65, 20.5%), the caprine specimens emphasize the meaty front and back limbs. This number of phalanges seems less anomalous

when the MNI of 16 individuals is taken into account, as each sheep has 24 phalanges. In the 1990 LBA report, the researchers posit that the presence of elements of the feet indicated butchery waste for Caprines, as they argue the metacarpal or metatarsal were left with the carcass but was usually chopped through in order to remove the lower extremities. However, the presence of feet does not necessarily indicate butchery rather than domestic food waste as nearly all the parts of the animal were consumed in the 18th century (Bowen and Brown 1998).

Based on Table 4, we can see there are far more specimens of lower limbs (i.e. radius, tibia) than upper limbs (humerus, femur), perhaps indicating a preference for leg of mutton than shoulder. The large number of carpals, tarsals and metapodia recovered may indicate that these elements were kept with the limbs after butchery (Landon 1996). The number and variety of bones belonging to the pelvis indicate different loin cuts, and the few identified cervical vertebrae could relate to a neck portion. Interestingly, there was at least one specimen that demonstrated a pathology or infection. A distal metatarsal was abnormally swollen and altered in its surface morphology, possibly due to a non-specific infection to the bone through the blood stream that could cause osteomyelitis (Baker and Brothwell 1980).

This collection of caprine specimens supports the idea that the assemblage is largely the result of domestic or butchery activities; there is very little in the collection that would not have been edible. A total of 48 caprine specimens (15.1%) exhibited butchery marks, although the total number of butchery marks recorded in the collection was 65. The discrepancy is due to the fact that several elements exhibited more than one butchery mark. Several limb bone specimens (N = 11) exhibited what was labeled a green or spiral fracture. This kind of butchery mark appears to result from the bone being chopped or hacked at and

then twisted until it breaks. Sometimes it was accompanied by a chop mark, but on others the chop mark was absent, potentially on the other portion of the bone. In this assemblage, this type of mark occurred on the humerus, radius, metacarpal, ilium, tibia, and metatarsal.

Many of the butchery marks found on caprine long bones (chops, shears and cuts) relate to the division of the limb into smaller portions or the disarticulation of the skeleton. Dismemberment of the carcass is reflected in the shears found near numerous joints: the glenoid fossa of the scapula, the distal end of the humerus, the proximal ends of the radius and ulna, and through the acetabulum of the pelvis. There is also a shear present on a fragment of a foramen magnum, which would indicate the splitting of the head. The metatarsals of the assemblage display a surprising amount of butchery: of the 7 butchered specimens there are 6 cuts, 2 chops, 1 spiral break, and 2 shears, with one specimen often having multiple butchery marks. Landon (1996) states that cuts perpendicular to the shaft on the metapodials of mammals may relate to the skinning of the animal, but any other marks present likely result from the division of the carcass into smaller portions.

Pig

Over 42 % of the pig specimens come from the head, including loose teeth (N = 34), mandible fragments (N = 7), and cranial fragments (N = 7). Approximately 30% of the collection comes from metacarpals, metatarsals, and phalanges. The limb bones in the collection are all likely high meat yield cuts, with several tibiae probably representing the ham and several humeri the pork shoulder. The pig remains displayed the least amount of butchery, with only 11 butchered specimens (9.6%), the most frequent modification being cut marks. One mandibular fragment exhibited cuts posterior to the 3rd molar which may relate

to either the removal of the tongue, or the removal of the jowl of the pig (Landon 1996). As with the cattle and caprine elements, we also see a number of shears through the vertebral column from the primary processing of the carcass. One astragalus displayed 5 parallel cuts on its superior articular surface, where it would connect with the tibia and fibula. These marks probably resulted from the separation of the tibia from the tarsals.

Bird

For each of the 6 species represented in the bird assemblage, the specimens were divided up into skeletal categories for further analysis (Table 5). The majority of the assemblage falls into the upper and lower fore and hind limbs and the body, indicating that these remains were from food cuts. The lack of cranial fragments supports this, as Landon (1996) states that heads were often removed from bird carcasses before they were sold. Of the limbs, the lower hindlimb was the least frequent, potentially due to the removal of the birds' feet. Few butchery marks were found on the bird bones ($n = 3, <1\%$), except for a couple of cut marks on long bones that are probably associated with the preparation or consumption of the bird.

Although birds did not contribute as much meat to the New England diet as the larger mammals did, their presence in the Faneuil Hall assemblage allow us more insight into the site's depositional history. The large number of bird bone indicates that the fill was deposited quickly and then covered, without much destruction or secondary deposition occurring that could damage the smaller bones. The bird bones in the assemblage were in very good condition, and the presence of small specimens and fragile body parts such as the beak demonstrate that archaeological recovery was very good at the site.

Body Region	Duck		Geese		Pigeon		Chicken		Turkey	
	NISP	% of NISP	NISP	% of NISP	NISP	% of NISP	NISP	% of NISP	% of NISP	% of NISP
Cranium	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mandible	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	11.1%
Vertebral Column	0	0.0%	0	0.0%	0	0.0%	1	2.6%	0	0.0%
Body	5	23.8%	4	80.0%	25	30.5%	12	30.8%	5	55.6%
Pelvis	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Upper Forelimb	7	33.3%	1	20.0%	25	30.5%	13	33.3%	1	11.1%
Lower Forelimb	5	23.8%	0	0.0%	11	13.4%	1	2.6%	1	11.1%
Upper Hindlimb	3	14.3%	0	0.0%	18	22.0%	8	20.5%	1	11.1%
Lower Hindlimb	1	4.8%	0	0.0%	2	2.4%	2	5.1%	0	0.0%
Unidentified Long Bone	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Unidentified Phalanx	0	0.0%	0	0.0%	1	1.2%	0	0.0%	0	0.0%
Total NISP	21	100.0%	5	100.0%	82	100.0%	39	100.0%	9	100.0%

Body Region	Chicken Family		Grouse		Small Bird		Large Bird		Unidentified	
	NISP	% of NISP	NISP	% of NISP	NISP	% of NISP	NISP	% of NISP	NISP	% of NISP
Cranium	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mandible	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vertebral Column	0	0.0%	2	20.0%	0	0.0%	0	0.0%	2	0.9%
Body	2	50.0%	3	30.0%	4	26.7%	0	0.0%	15	7.0%
Pelvis	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.9%
Upper Forelimb	1	25.0%	3	30.0%	4	26.7%	1	33.0%	21	9.8%
Lower Forelimb	1	25.0%	2	20.0%	1	6.7%	0	0.0%	1	0.5%
Upper Hindlimb	0	0.0%	0	0.0%	2	13.3%	0	0.0%	8	3.7%
Lower Hindlimb	0	0.0%	0	0.0%	4	26.7%	0	0.0%	11	5.1%
Unidentified Long Bone	0	0.0%	0	0.0%	0	0.0%	2	66.0%	150	69.8%
Unidentified Phalanx	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5	2.3%
Total NISP	4	100.0%	10	100.0%	15	100.0%	3	100.0%	215	100.0%

Table 5: Skeletal Part Representation for Bird Taxa.

Ageing and kill-off patterns

Age is an integral part of zooarchaeological analysis at urban sites because it helps us better understand how different husbandry practices (such as dairying, meat production, draft, and wool production) impacted what kinds of meat were available to the urban consumer throughout the different seasons (Landon 1996). For this study, age of the domesticates was determined by examining epiphyseal fusion of long bones and tooth eruption and wear sequences, which are well documented for these animals (Hillson 1986, Reitz and Wing 1999).

It has been noted by researchers that the proximal and distal epiphyses of the long bones fuse to the diaphysis (shaft) at different ages in the animal's life (Reitz and Wing

1999). By recording the fusion state of each long bone during the cataloguing process, the researcher can then attempt to reconstruct age at death. The main drawbacks of fusion rates are that once the epiphysis is fused, you cannot tell how old the subject is, and “assemblages are composed of an undetermined number of individuals, represented in ways we can only guess” (Bowen 1998: 141).

As the majority of the teeth present in the overall assemblage were loose teeth rather than intact tooththrows, the information provided by tooth wear analysis was used to complement the data from epiphyseal fusion. Wear stages were recorded for individual loose teeth, but their eruption stage was considered more important for the overall age profiles. In the end, 16 teeth were considered usable for the cattle age profiles, 12 for caprines, and 19 for pigs.

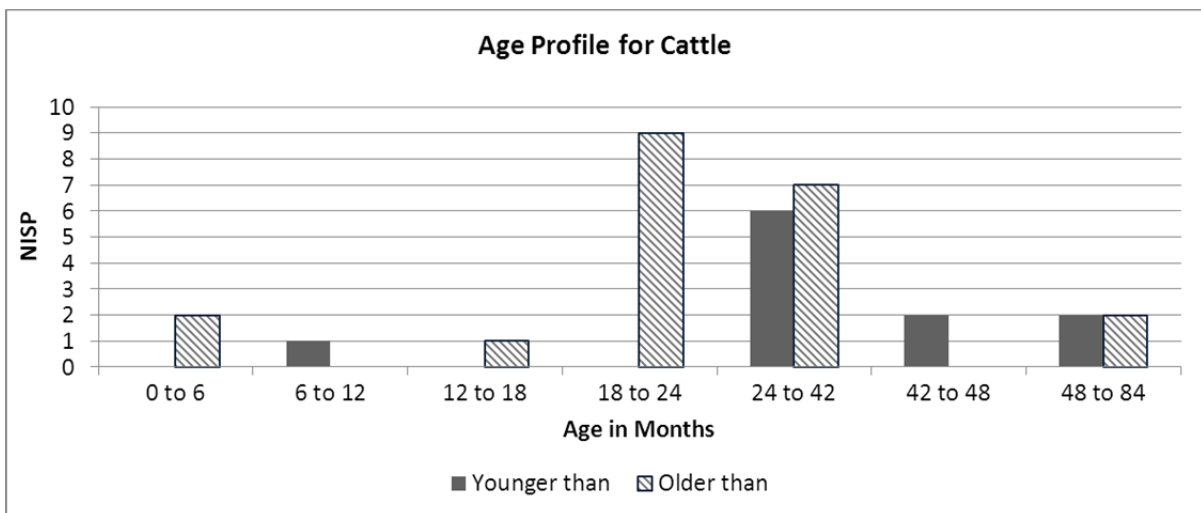


Figure 9: Age Profile for Cattle Specimens.

For cattle, analysis of fusion rates for the elements indicated the presence of two age groups (Figure 9). Fused proximal femur elements indicate an age older than 42 months, and a fused thoracic vertebral centrum indicates an age of 84-108 months. Several other

elements in the collection point to a much younger age group: an unfused distal metatarsal (<24-36 months) and an unfused distal tibia (<24-30 months), and an unfused acetabulum (>7-10 months). When combined with the data from tooth eruption and the MNI of 2, the results suggest that one individual was younger than a year old, and the other potentially older than 7 years at their death.

The caprine specimens in the assemblage were not identified as either sheep or goat, both species being very morphologically similar, so this affected the types of age categories than could be used in generating the profiles. The small number of identified loose teeth made a tooth wear profile not worthwhile, but the large number of caprine long bones made the epiphyseal fusion data more useful. Since sheep and goats have slightly different age ranges for element fusion, the data was split into early, middle, and late fusing, following Reitz and Wing (1999).

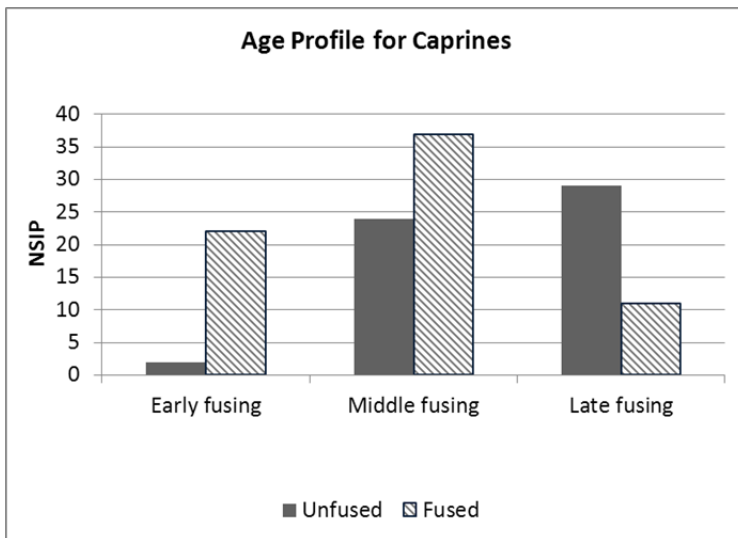


Figure 10: Age Profile for Caprine Specimens.

In examining the epiphyseal fusion of different skeletal elements within the assemblage, it appears that individuals from several different age groups are present (Figure 10). An unfused acetabulum and unfused proximal radii indicate individuals younger than a

year old, while several fused distal radii and vertebral centrums point to caprine individuals older than 3 years. The presence of juveniles is also supported by a mandibular fragment with a somewhat worn dp4, a deciduous tooth that is only present in younger animals. In comparison with the other domesticates present in the Faneuil Hall assemblage, the age profile of caprines displays the most variety, possibly indicating a more complex husbandry pattern.

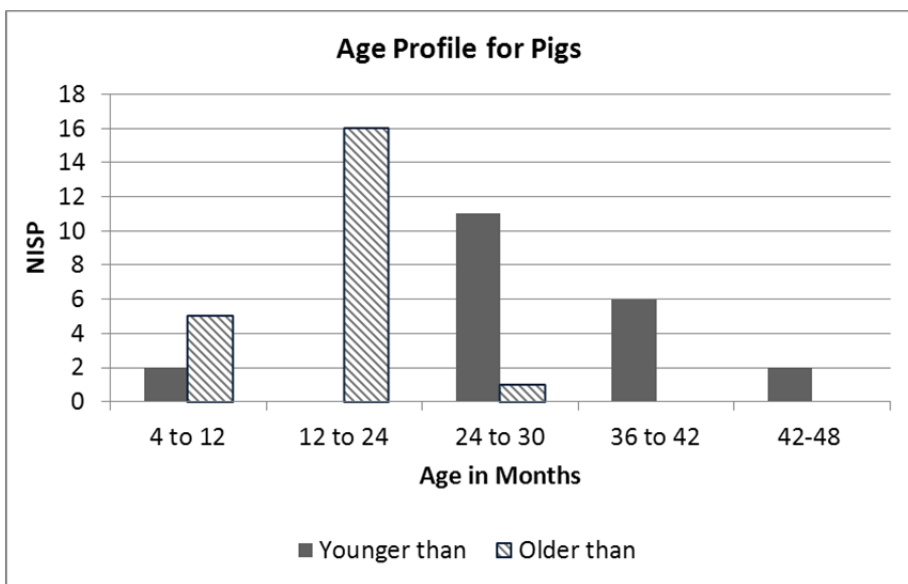


Figure 11: Age Profile for Pig Specimens.

The pig remains generated an MNI of 2, and the combined relative age data suggests that the individuals fall into two age groups (Figure 11). At least one of the pigs is a juvenile (less than a year old), based on an unfused acetabulum and several molar crowns in the process of formation. The other individual is an adult (older than 2-3 years), indicated by a fused distal metatarsal and dentary fragments with an erupted and in wear M3. There is also an unfused calcaneus fragment in the Faneuil Hall collection that was not positively identified to a taxon, but could be a neonatal pig.

Summary

The faunal assemblage from the Faneuil Hall excavation was made up of 4213 specimens. The limited disturbance from animal or human factors after deposition meant that the bones were very well preserved, and the high level of recovery during excavation allowed us to get the fullest idea of what Bostonians in the early 18th century were eating. Unsurprisingly, domesticated mammals were the majority of the total assemblage, with the caprines (sheep or goat) being the most common, followed by pig and then cow.

By examining body part representation, age at death, and placement of butchery marks within the mammal assemblage, we can deduce that the bones represent either the remains from daily food trash of the local community or the waste from local butchers. In either case, we see the use of everyday trash towards the creation of the landfill within the Town Dock. With the butchery marks we see evidence of both initial and subsequent division of the animal into specific cuts of meat, and the bones represent by and large the meatier portions. How this relates to the larger scholarship about diet in historic New England will be explored in the next section.

Whereas the mammal assemblage is comprised of the usual domesticates (cow, sheep, and pig), the fish, shellfish, and bird specimens represent a much more varied aspect of the Boston diet, as well as the use of wild resources by the urban community. Although a much smaller contributor to the diet overall (you can get a lot more meat from a cow than from a duck), the use of these wild resources is interesting and will be further explored in the next chapter.

CHAPTER 4

DISCUSSION AND CONCLUSION

Landfill is an important and inescapable aspect of the urban landscape. With much of modern Boston sitting upon historic garbage, archaeology of the city requires that we incorporate studies of landfill deposits into our understanding of its history. This material represents a community midden that lets us study an average of what people were doing in the past (Cantwell and Wall 2001). The landfill deposit under Faneuil Hall thus offer an opportunity to examine Boston's foodways and the influence of the growing market system as it represents the refuse and food remains from portions of a local community.

As mentioned earlier, other potential contributors to the fill underneath Faneuil Hall were local butchers who were given leave to dispose their waste at several water sources around Boston. One of the goals of the archaeological excavation at Faneuil Hall is to determine what types of activities the artifacts (including the faunal remains) represent. To that end, with the first excavation LBA divided the assemblage into three categories: commercial waste, butchery waste, and dietary waste (LBA 1999). As a whole, the faunal assemblage was seen as the remains of dietary or food waste, but the other two categories were present. Commercial waste referred to the faunal material that would have been used in

economic or trade activities; in this case, the presence of hacked off horn cores for both cattle and sheep were seen as an indicator, as these items would not have been eaten (LBA 1999: IX-11). Phalanges and certain skull elements (often those without butchery marks) were taken as indications of butchery waste, as the researchers reasoned that the heads and feet were typically discarded during the butchery process. However, this assumption is not foolproof, as the LBA researchers acknowledge. The numerous colonial recipes for calves' foot jelly and different kinds of brain meats indicate that the heads and feet were often consumed and therefore not necessarily waste (Simmons 1796, Carter 1803).

The present study sought to avoid this assumption, and determined that the Faneuil Hall assemblage represents domestic food waste from the surrounding Boston community. The collection emphasizes larger roasts and cuts over individual portions and the absence of saw marks on any of the specimens support its being an 18th-century assemblage (Bowen 1992:279). In general, the butchery follows the initial division of the animal carcass after evisceration and then additional separation into large roasts and other meat cuts. Though non-meaty elements, such as teeth, skull fragments, and toes, were present and often frequent, their numbers can be explained by different factors. The hard composition of teeth guarantees their survival in the archaeological record and their easily recognized shapes and features make them more identifiable in the field when screening, therefore it is no surprise that teeth are a large portion of what was recovered for each of the main domestic mammals. As for skull and toe fragments, neither of these was present in amounts that went beyond what would be expected for each species based on the calculated MNI. For instance, there are 35 bones in the head of a cow and 24 toes in a sheep skeleton. Perhaps more importantly, in

the 18th century there were no laws yet restricting either the use or disposal of an animal carcass' head or feet (Brown and Bowen 1998: 75).

If we accept that the Faneuil Hall assemblage represents food refuse over the other two categories, what can the remains tell us about the availability of different meat cuts and species in the urban market during the 18th century? Researchers estimate that shortly after its founding, Boston's food production was no longer able to support its inhabitants and the amount of available farmland and pasture and the number of livestock animals kept in the city steadily dwindled during the 18th century (Bowen 1998, Friedmann 1973, Landon 1996). In order to support its growing population, Boston increasingly relied on the surrounding towns as its sources of meat and other products. This shift may have prompted rural farmers to change their animal husbandry practices to better accommodate the demand from the city center (Bowen 1998, Landon 1996, Maltby 1979). The specific sources of the meat found at Faneuil Hall is not known, but from historic sources we do know that there were several large farms around Massachusetts that had enough resources to send animals into the Boston Market (Friedmann 1973, Landon 1996). However, Landon (1996: 13) emphasizes that we cannot assume all 17th- and 18th- century farmers in Massachusetts were wealthy enough to engage in specialized production specifically for urban markets. The majority of farmers had only a few animals and could not generate the surplus needed, so change in husbandry practices likely only reflects shifts of those larger farms around Boston.

Bowen posits that what we can expect from urban faunal assemblages are “an irregular distribution of body parts, a disproportionate percentage of meat bones, and a low number of bones that are commonly associated with butchering waste” (1998: 138). Landon adds that the increasing specialization in the urban environment would have led to more

butchery being done by specialized butchers rather than by individuals at home, with most urban residents buying their meat “from butchers, merchants, and local farmers who brought animals into town” (1996: 56). However, the declining number of butchers plying their trade in Boston by the end of the 18th century could potentially mean that urban residents were either doing some of their own butchery or were able to buy portions directly from the street sellers (Brown and Bowen 1998, Friedmann 1973, Landon 1996).

Many researchers have attempted to make a distinction in the faunal record between the animals that were killed and butchered on site and those that were bought already butchered from specialists, the hypothesis being that the presence of all portions of an animal’s skeleton could indicate that some processing was taking place on site (Brown and Bowen 1998, Crabtree 1990, Zeder 1984). However, this distinction is difficult to see in an urban environment as it is possible that an urban family brought the animal to a butcher for the primary processing, but did some secondary butchery at home (Brown and Bowen 1998, Landon 1996). It was not until the later part of the 19th century that people were no longer able to put their animals to pasture in Boston Commons or the nearby islands (Bowen 1992), so it is likely that many Bostonians contemporary with the filling of Faneuil Hall still kept a few domestic animals for themselves.

By combining the data generated from examining age at death and skeletal part representation at Faneuil Hall, we can attempt to tease out how this assemblage reflects the model of the urban market discussed above. Comparisons with other zooarchaeological studies in New England and contemporary sites will provide a better idea of what the Faneuil Hall faunal assemblage can contribute to our understanding of colonial Boston foodways and its market system.

Cattle

Although the cattle remains from the Faneuil Hall assemblage likely represent only two individuals, the age profile reflects what Landon (1996) found: a bimodal pattern of very young and much older individuals being slaughtered for food. In examining husbandry practices, the assumption is that animals raised primarily for food would be killed much younger, while animals used for draft, dairy or wool production would be kept alive for longer (Landon 1996:96). The Faneuil Hall cattle remains indicate that there were some animals being raised for meat and others kept at farms for draft or dairying until a more advanced age when they were then sold (Bowen 1998, Landon 1996). At contemporary Boston sites, Bowen (1998: 143) found that the increase in dairying during the 18th century led to a similar increase in the number of calves that could be sold to market, with the remains of veal accounting for 75% of cattle remains at Boston sites by the 1720s to 1740s.

The NISP for cattle is very small in this study, but as stated earlier, all portions of the skeleton are represented, apart from the humerus and metacarpal. While the meatier elements are represented in the assemblage, as would be expected in an urban setting, there are several examples of the head and feet. In their study of the Cross Street Backlot privy faunal assemblage, Brown and Bowen (1998: 75) document that this early 18th-century assemblage also contained all portions of the cattle body, including the head and feet. However, in his study colonial Boston foodways, Landon found that cattle distal metapodials and phalanges were underrepresented at urban sites, and attributed this lack to “the removal of the feet by urban butchers” (1996: 53). It must be noted here that Landon’s study covers archaeological sites that contain material dating from the 17th century to the 19th century, so greater variation is possible.

Seasonality is another important factor in this analysis. Bowen's seasonality model states that veal was available during the summer months, and after the dairying season was complete, beef was abundant from October to February (1998). If we follow what Seasholes (2003) states regarding the construction of Faneuil Hall, the site was filled between June of one year and February of the next. This would appear to be the prime time for beef consumption, and yet this is not necessarily reflected in the low numbers of cattle specimens and the MNI of only two individuals. We must take into account, however, the central bias within any faunal assemblage to "bone-in" meat cuts only. Fillets, flank steaks, and other boneless cuts remain invisible in the archaeological representation of urban diets" (Milne and Crabtree 2001: 32). In addition, while many animals were taken to market alive and "on the hoof," some farms "were shipping barreled or otherwise preserved meat to Boston," and it is not clear from historic records what portions or bones would have been put in those barrels (Landon 1996: 14-15).

Caprines

With a minimum of 16 individuals and a much higher NISP, the caprine age profile reflects a more complex husbandry pattern. As discussed earlier, there appear to be individuals from every age group in the assemblage, which is markedly different from the slaughtering ages of either the cattle or pig remains. According to Payne (1973), the best time to slaughter sheep and goats is between 18 and 30 months of age, when they are at their optimum meat weight. However, if wool was the primary goal, the sheep may be slaughtered as late as 6 or 7 years old (Payne 1973, Bowen 1998). Based on the data, the caprine specimens at Faneuil Hall represent both juvenile animals slaughtered specifically for their

meat and older animals that were raised for wool and later killed. From the age profile, there are also indications of individuals younger than a year old being slaughtered, which is paralleled at several contemporary Boston sites (Bowen 1998, Landon 1996). In his study, Landon argues that the presence of much younger caprine individuals suggest that rural farmers may have “raised lamb specifically for urban markets” (1996: 57).

Although the primary purpose of sheep husbandry was their wool, with meat as a secondary by-product, there was a shift during the 18th century towards an increased use of lamb and mutton as an urban food source (Bowen 1998, Greenfield 1991). Originally, a farmer’s small surplus of sheep was likely sent to a market, but with the intensification of meat production we see a decreasing number of older sheep individuals and an increase in the younger individuals raised specifically for their meat (Bowen 1998: 146). Slaughter patterns in the early 18th century were very similar between urban and rural sites, with the majority of sheep individuals being killed off after 42 months. However, by the 1740s the number of older sheep individuals at Boston sites decreases, potentially indicating a shift away from wool production as the primary goal.

The caprine specimens at Faneuil Hall represent all portions of the body, from the head to feet, with meatier elements (such as the fore and hind limb) being a larger portion of the total NISP, as is predicted for an urban setting (Bowen 1998, Zeder 1984). In particular, the emphasis on the femur, tibia, and calcaneus parallels the preference of Bostonians for leg of mutton found by Landon (1996). Bowen and Brown’s (1998) analysis of the Cross Street privy assemblage found there were far more caprine foot and head elements present than at most other historic sites in the Boston area. The researchers argue that this may indicate some

of the sheep eaten by city residents were kept and perhaps partially butchered on site (1998: 76).

Since the caprine collection at Faneuil Hall was extensive, I decided to do a comparison with the collections from the Wilkinson Backlot Site (BOS8) and Paddy's Alley/Cross Street Backlot Site (NEO3C) studied by Landon (1996) as he documented the difference in use of sheep between urban and rural sites in New England. Again, the main problem is making comparisons between the Faneuil Hall collection and assemblages spanning longer periods of time. Overall the three urban assemblages appear to be very similar in their emphases on the meaty upper and lower limb bones, however it appears that there are more carpals, tarsals, phalanges, and more examples of tibia fragments in the Faneuil Hall assemblage. The similarities between the assemblages support the idea that the material from Faneuil Hall represents an average of a Boston community.

Body Part	F.H.		BOS8		NEO3C	
	NISP	% of NISP	NISP	% of NISP	NISP	% of NISP
Cranium	5	1.6%	6	3.7%	17	6.23%
Mandible	3	1.0%	3	1.9%	7	2.6%
Teeth	26	8.3%	7	4.3%	24	8.8%
Vertebral Column	8	2.5%	37	23.0%	21	7.7%
Body	4	1.3%	4	2.5%	9	3.3%
Pelvis	24	7.6%	1	0.6%	16	5.9%
Upper Forelimb	50	15.9%	30	18.6%	55	20.1%
Lower Forelimb	22	7.0%	18	11.2%	20	7.3%
Upper Hindlimb	54	17.2%	19	11.8%	61	22.3%
Lower Hindlimb	53	16.9%	32	19.9%	31	11.4%
Phalanges	65	20.7%	4	2.5%	12	4.4%

Table 6: Caprine Skeletal Representation across Three Boston Sites. (F.H. = Faneuil Hall, BOS8 = Wilkinson Backlot Site, NEO3C = Paddy's Alley/Cross Street Backlot Site)

Landon (1996) found that caprines were twice as well represented at urban sites than rural sites, and that the urban market may have been a way for farmers to make a profit of their excess lambs or sheep that could not be used for wool production. And unlike beef or

pork, mutton was not usually salted or smoked and its preservation was limited (Bowen 1990: 143). This meant that once an animal was slaughtered, it needed to be sold quickly (Landon 1996). However, in terms of dietary importance (see Figure 12), the biomass figures indicate that the meat represented by the Faneuil Hall assemblage is almost equal for cattle and sheep, even though cattle are represented by fewer specimens overall.

Pigs

The slaughter profile for pig is very similar to cattle, but again, with an MNI of 2 it is difficult to make any substantial remarks. Like the other domesticates, the pig remains at Faneuil Hall represent nearly all of the skeletal portions. Overall, in terms of meaty elements, there appears to be an emphasis on the skull, upper forelimb and lower hindlimb, which parallels Landon's (1996) finding in his comparison of urban and rural foodways in New England. The biomass figures indicate that pigs were a much smaller contributor to the Bostonian diet (9.5 kg, 8%), but analysis of the dietary importance of pigs is difficult for several reasons. In contrast with the other domesticates, many pigs were typically slaughtered at a very young age so their more fragile bones may not survive as well in the archaeological record (Maltby 1979). In addition, we must also take the "bacon factor" into account (Crader 1984). Unlike most other meats, pork was available year round because it was the easiest to salt and cure, and could therefore be kept in barrels or storage and used when other meat was scarce (Bowen 1988). This type of processed meat would not necessarily leave any visible trace in the archaeological record. Thus what we see in the archaeological record may not accurately reflect the dietary importance of pigs.

In his study of the archaeological fill beneath 175 Water Street in New York City, Greenfield found that the role of pigs in the city's diet may have shifted during the 18th century, becoming less central as pasturage for keeping cattle and sheep became more secure. However, other researchers document the presence of neonatal and infant pigs at a 19th-century site, which many indicate New Yorkers were still raising their own swine in backlots (Milne and Crabtree 2001). It is likely that Bostonians too kept pigs and other small animals on their house lots into the 19th century. We know that in 1634 the town voted that pigs should be "kept up in yards," and were no longer allowed to freely roam the streets of Boston, but the keeping of domestic animals was not banned in Boston until much later in the 19th century (Landon 1996: 12)

Contribution of Wild Species

We see from the discussion above that the 18th century Boston diet was dominated by the three major domesticated mammals: sheep/goat, cattle, and pigs. While birds and fish had large MNIs (21 and 6 respectively), their overall contribution to the diet was negligible in comparison. This is demonstrated by the biomass calculations; see figure 12 below. In total, domesticated mammals made up for 113.6 kg, or 97% of the total biomass, but birds were only 2% and fish 1%. It should be noted here that several of the bird and fish specimens could not be included in the biomass calculations because they were not assigned to a particular species. The Boston diet may not have been diverse in terms of the meat consumed, but we can imagine that the use of animals such as wild birds and fish would have been seen as important in creating variety for day to day eating. The use of these wild species is often very informative about urban foodways and the market system and coincides

with one of the major differences found between urban and rural faunal assemblages (Landon 1996, Reitz 1984).

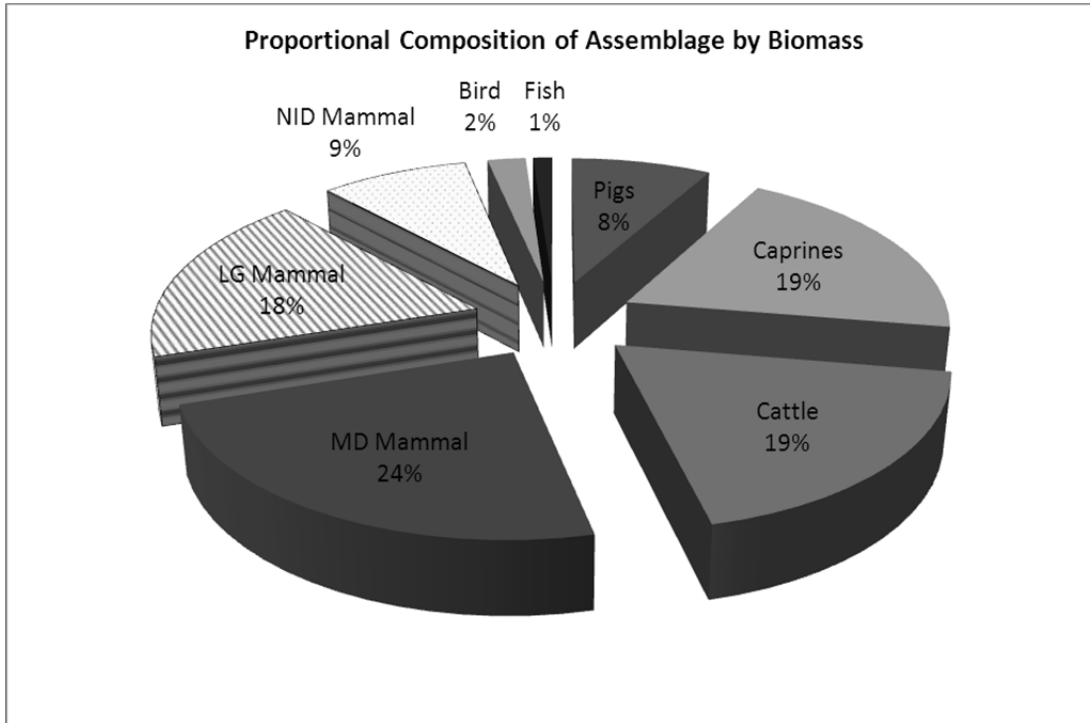


Figure 12: Proportional Composition of Assemblage by Biomass.

In studying urban foodways, authors often try to understand how urbanization and the creation of a specific urban market changed what kinds of meat were available to city residents (Crabtree 1990, Maltby 1979, Zeder 1991). It is thought that increasing urbanization leads to a decrease in the overall faunal diversity of the diet, as reflected through the use of domestic and wild animal resources (Rothschild 1989). Although the differences between urban and rural assemblages are often site specific and related to issues such as taphonomy and local environment, the general finding is that rural residents are more likely to have access to and exploit wild resources (Reitz 1984). This is usually the case at historic sites throughout the country, although the major domesticates were often by far the major

component of both rural and urban diets (Bowen 1992, Landon 1996, Reitz 1984, Zierden and Calhoun 1986).

While the use of wild species may be more visible at rural sites (Reitz 1984, Landon 1996), the presence of those same species on urban sites can tell us a lot about how city dwellers varied their diet. For example, fish can serve as sensitive indicators because of the “larger number of species found in most areas and their corresponding narrow ranges of ecological tolerances” (Brown and Bowen 1998: 77). Researchers have found large amounts of cod and haddock remains in Boston faunal assemblages, reflecting the influence of the fishing industry, and Brown and Bowen (1998) document the shift from cod to haddock during the 18th century, possibly due to overfishing. The Faneuil Hall assemblage fits in nicely here, as a large percentage of the identified fish remains, 22.2% or 40 specimens, were of the Gadidae family, which includes cod and haddock.

In New York City, zooarchaeological analysis has shown that city residents continued to exploit wild fish resources even into the 19th century, when standardization of meat cuts and available animals in the market was increasing (Milne and Crabtree 2001, Rothschild and Balkwill 1993). Milne and Crabtree document at least 22 different species of imported and locally available fish at the Five Points brothel, and point out that later 19th-century Five Points residents were consuming more imported fish, such as cod. Taking an environmental perspective, Rothschild and Balkwill (1993) highlight how the filling in of land around New York City likely altered the habitats of the wild animals, especially mollusk beds and the corresponding fish that fed off of them; thereby changing what fish species were available over time.

All of the species found at Faneuil Hall were locally available and could have been purchased at one of the several fish markets located near the Town Dock in the 18th century. However, the skeletal representation of the assemblage constrains what we can say. The small number of fish bones within the Faneuil Hall assemblage, combined with the small proportion of head elements (roughly 13% of the NISP) and high proportion of vertebrae and rays, suggest these bones are largely food trash from domestic households with no indication of fish bone refuse from commercial fishery activity. The presence of head bones within the fish assemblage would indicate that the fish were eaten fresh rather than salted, because “on board the fishing vessels during the salting process, heads were removed and either thrown away or used as bait” (Brown and Bowen 1998:78). Despite Faneuil Hall’s central location in Boston’s fishing industry, and the presence of numerous historic fish markets in the streets nearby, the assemblage reflects the fish remains from consumption, perhaps of salted rather than fresh fish.

From colonial cookbooks, such as *American Cookery* by Amelia Simmons (originally published in 1798), we know that New Englanders were keen on cooking and eating other wild resources such as pheasants, wild ducks, wood cocks, snipes, partridges and pigeons. In stark contrast with the fish remains, the preservation and representation of bird specimens within the Faneuil Hall assemblage was very good and allows for the comparison to other contemporary sites. As stated previously, the Faneuil Hall remains represent domestic food waste and contain examples of both wild and domestic fowl, with the emphasis being on those species that were potentially hunted: duck, geese, passenger pigeon, and grouse. The previous excavation at Faneuil Hall documented a similar spread of bird species, with the addition of some wild shorebirds (LBA 1999).

In their studies of urban versus rural foodways, Reitz (1984) and Landon (1996) document differences in the use of birds as a resource. Reitz found that the urban residents consumed a greater range of domestic birds (such as chicken) and little to no wild resources. Landon found a variety of domestic and wild birds in the urban and rural assemblages, with at least 12 different types of wild birds at the combined rural sites and 5 at the urban (1996: 117). Many of the taxa documented at the urban and rural sites are found in the Faneuil Hall assemblage, but the rural sites in Landon's study also contained remains from hawk, bald eagle, bluejay, and other perching and aquatic birds. However, Landon attributes this apparent differential use of wild bird taxa to issues of preservation and recovery at the rural sites (1996: 117). In their study of the Cross Street privy, Brown and Bowen (1998) find a similar lack of diversity in the faunal assemblage, the major bird resources being chicken and passenger pigeon, with little wild game present. But this dearth of wild resources in historic Boston may not extend to all colonial cities. In their study of New York City's changing faunal resources, Rothschild and Balkwill (1993) document as many as 20 different bird taxa from urban assemblages, with a great diversity of wild and domestic resources throughout the 17th and 18th century, although there is a marked increase in the use of chicken over time.

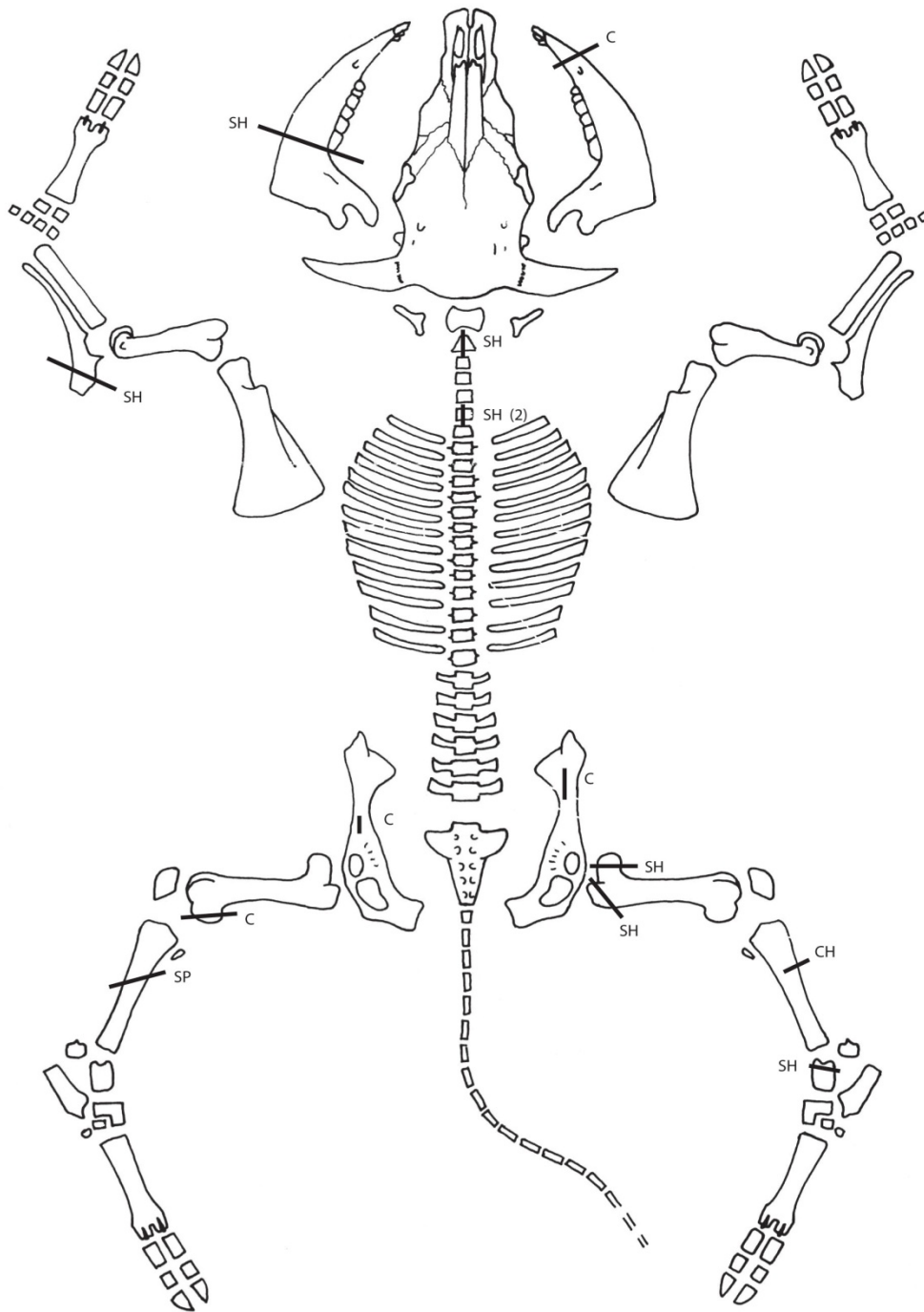
Conclusion

The goals of this thesis have been to understand who could have contributed to the fill underneath Faneuil Hall and what the faunal remains in the fill can tell us about the 18th-century Bostonian diet. From historic documents we know that the Town Dock was filled in piece-meal over time, but there are no clear statements about where the material came from. But by extrapolating from contemporary views on public health and related archaeological

sites, we can argue that the Faneuil Hall assemblage represents the domestic trash from the nearby community. As the Town Dock fell into disuse and disrepair, garbage from the town's ad-hoc sanitation system, the nearby Mill Creek (a favored place for dumping animal remains), and the city streets threatened to gradually fill it up. When the southern portion of the Dock was to be purposefully filled in 1728-1729, it was a receptacle for the daily trash of the merchants, shop-keepers, and other residents of the surrounding community.

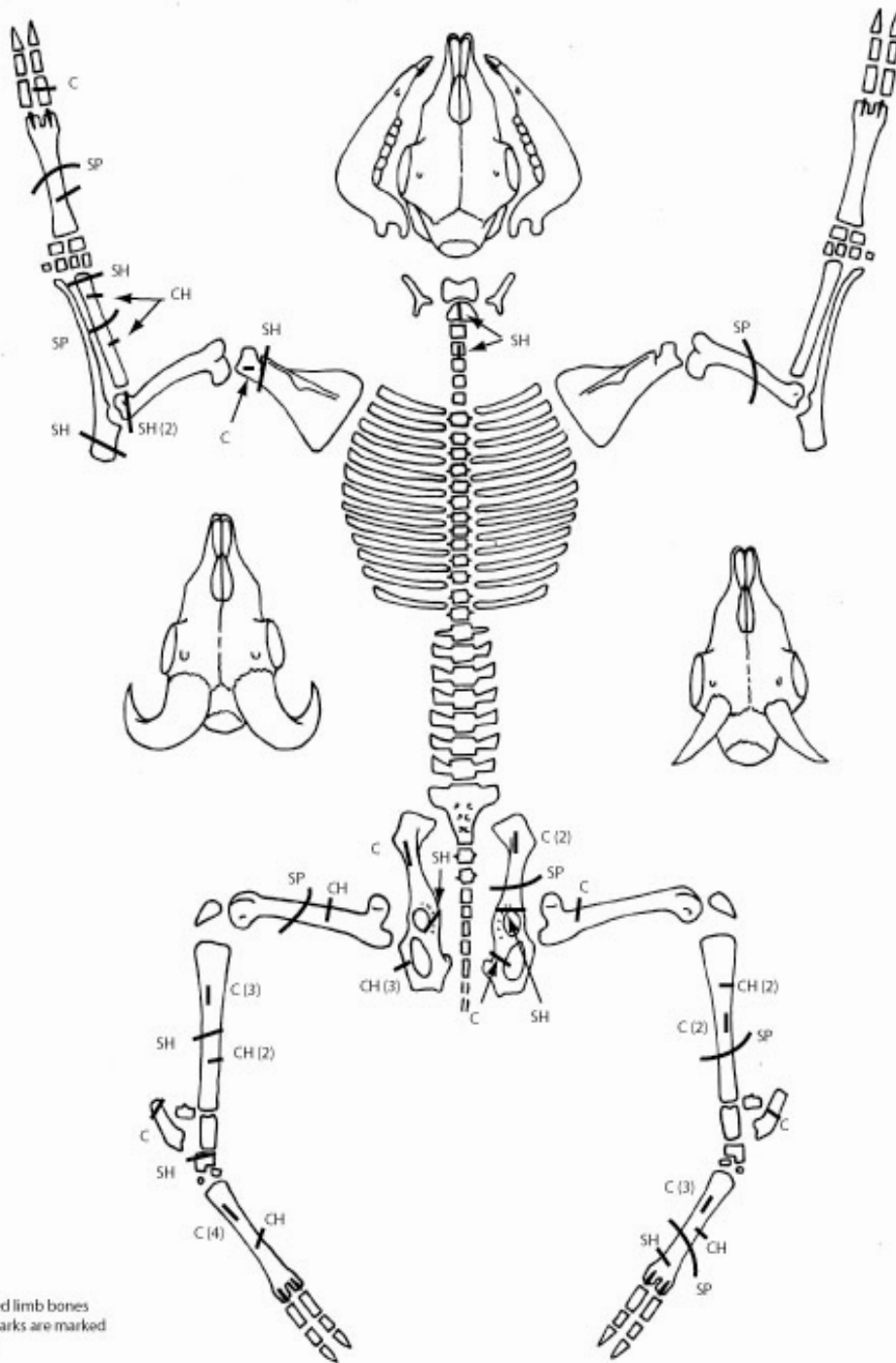
Although the assemblage comes from a landfill context, it gives us a glimpse into the everyday foodways of an 18th century Boston community. The 18th century was a time when rural producers are changing and negotiating their husbandry methods with the requirements set by the growing urban market, so more variety in ages and species is possible. The Faneuil Hall faunal assemblage demonstrates that domestic mammal meat—beef, mutton, and pork—was clearly the dietary staple. This was augmented by small quantities of domestic and wild birds, saltwater fish, and shellfish. As is to be expected with a growing city, meat raised on rural farms provided the bulk of the diet, and wild animals resources were less and less used as people came to depend on markets for their meat.

APPENDIX A
LINE DRAWINGS OF BUTCHERY MARKS



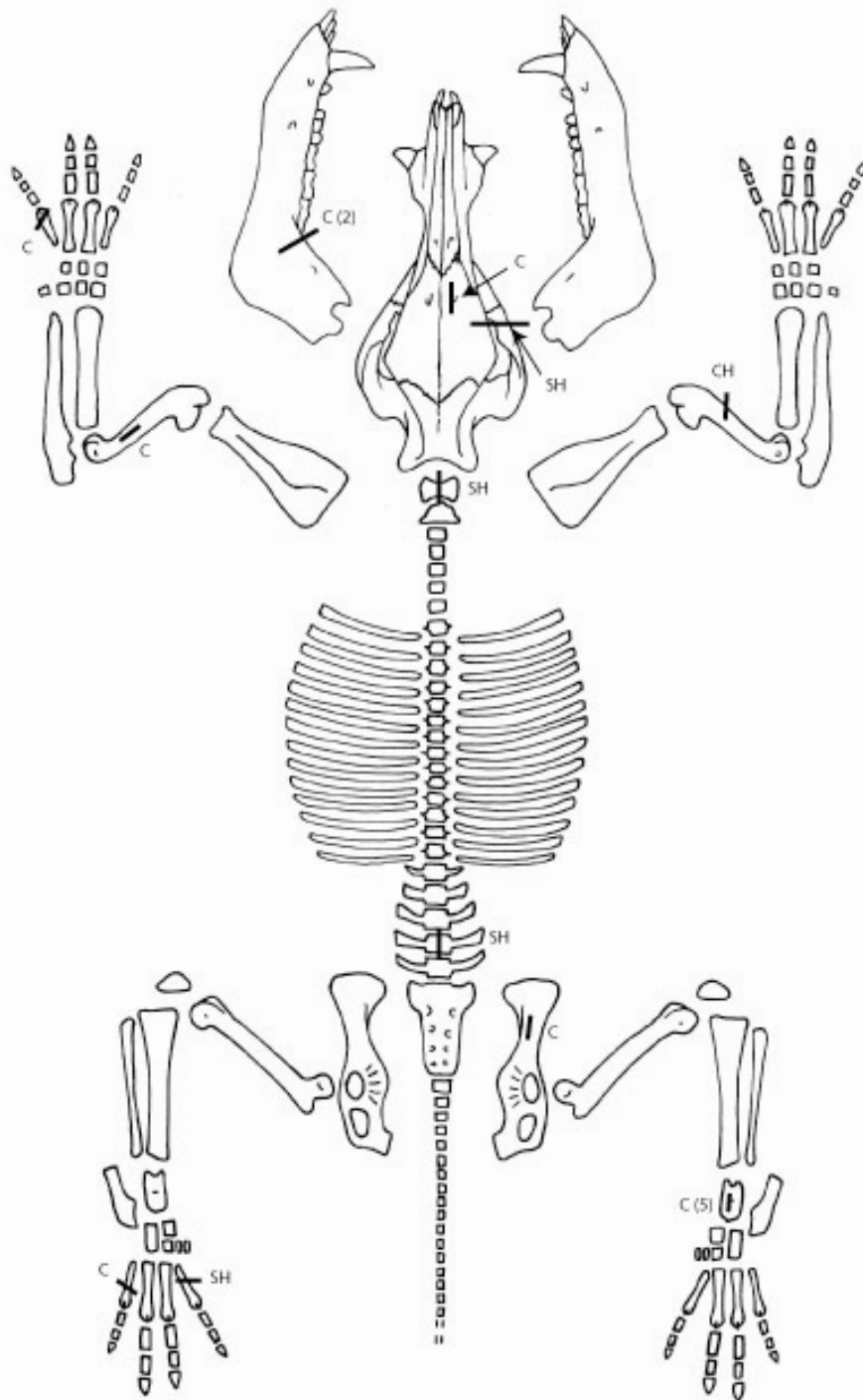
Cattle Butchery Mark Representation for the Faneuil Hall Assemblage. Adapted from Hemler 1987

SH = Shear, SP = Spiral Fracture, CH = Chop, C = Cut



Caprine Butchery Mark Representation for the Faneuil Hall Assemblage. Adapted from Hemler 1987

SH = Shear, SP = Spiral Fracture, CH = Chop, C = Cut



Pig Butchery Mark Representation for the Faneuil Hall Assemblage. Adapted from Hemler 1987

SH = Shear, SP = Spiral Fracture, CH = Chop, C = Cut

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