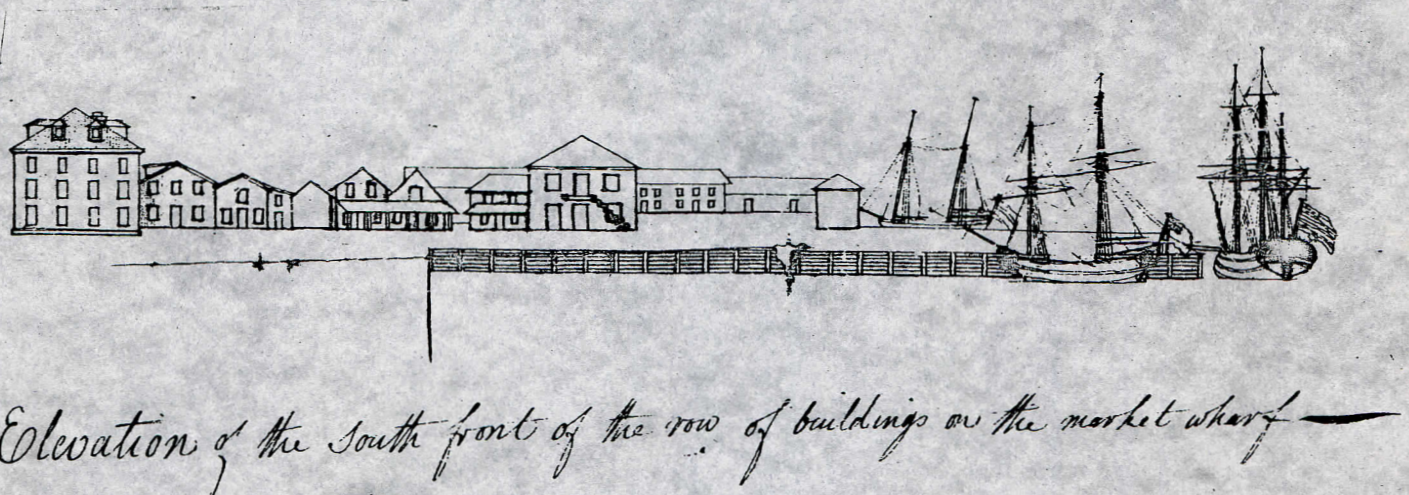
Excavations on Charleston's Waterfront: the Atlantic Wharf Garage Site



Archaeological Contributions 30
The Charleston Museum
February 2002

Excavations on Charleston's Waterfront: the Atlantic Wharf Garage Site

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A summary and interpretation of
excavations conducted in 1983

PREPARED FOR
the City of Charleston
The Charleston Museum

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Acknowledgments

The project was sponsored by the City of Charleston. Ms. Mary Ann Sullivan of the Mayor's office, Mr. Mario Ciappa of the City Engineer's Office, and Mr. Steve Livinston of the Department of Parks provided much-needed assistance. Fieldwork was conducted by the Museum archaeology staff, Martha Zierden, Elizabeth Paysinger, and Jeanne Calhoun. Volunteers included Myrna Rowland, Kathy Swanson, Oliver Buckles, Del Perry, and Michael Trinkley. We thank them for their time and assistance. Historical research was conducted by Jeanne Calhoun. Special thanks to New South Associates for use of data from the Vendue/Prioleau project. Bonnie M O'Brien and H. Catherine Brown provided invaluable assistance on the faunal analysis.

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The Atlantic Wharf Project

Introduction

In 1983 the City of Charleston proposed to build a multi-story parking garage on the block bounded by East Bay Street, North Atlantic Wharf Street, Prioleau Street, and Mid Atlantic Wharf Street. At the time of construction, the block was nearly vacant, but documentary study suggested that the land was fill, or 'made land', east of the original high water mark, and part of the docks and wharves of the 18th and 19th centuries. Because the project was supported in part by an Urban Development Action Grant to the City of Charleston, archaeological study was required. Documentary and archaeological research ongoing at that time, in preparation for a Research Plan for the city, suggested that the filled land could contain intact archaeological resources worthy of study. Therefore, a grant from the City of Charleston to The Charleston Museum allowed for testing at the site.

The project was conducted in 1983 and consisted of limited documentary research and archaeological testing. Two units were excavated by hand in a two-week period. The excavations were conducted to just below the water table, and revealed a layer of fill dating to the late 18th to early 19th century. The fill contained well-preserved cultural, botanical, and faunal materials, which were subject to detailed analysis. Though small, the samples from Atlantic Wharf contained materials unique to Charleston. Inadequate funding delayed completion of the project. This report makes those data available.

The Charleston Waterfront

When the Charles Town settlement was moved from Albemarle Point to the peninsula, an area of relatively high bluffs, narrow marsh, and deep water access was deliberately chosen for the new port city. This area along the Cooper River appeared best suited for shipping, and in 1680 the settlers founded a walled city bounded by present-day East Bay, Water, Meeting, and Cumberland Streets. Water Street and Market Streets represent original creeks outside of the south and north walls, respectively. The eastern edge of the city, present day East Bay Street, was also the water's edge in the early years of settlement, surrounded by a brick sea wall by the early 18th century

During the first decade of the existence of the town, the captains of ocean-going vessels had to use lighters to carry their goods to the town's docks (Zierden and Calhoun 1984:69). In the 1690s, however, those areas deep enough for large ships were converted into wharves (Green

1965:12) while the other areas along the bay became fashionable residential districts. A map drawn by Edward Crisp in 1704 indicates two wharves, roughly opposite present-day Tradd and Queen Streets. Begun as mere docking facilities, these wharves rapidly expanded. Shops, storage, and counting houses were soon built on such structures.

The map drawn by Roberts and Toms in 1739 shows eight wharves extending east from the curtain tide (East Bay Street). The western half of these areas was apparently dry at low tide. These wharves were located in the southern half of the walled city, between Broad Street and Granville's bastion.

A commercial core, focusing on the wharves, developed during the first half of the 18th century (Calhoun et al. 1982). As Charleston gained importance as a distribution point for the surrounding region, more and more wharves were built. The growth and development of the town resulted in the filling of marsh and creeks. Some were filled casually with trash and debris, other areas were filled deliberately, as when Christopher Gadsden advertised for ships' ballast to provide solid ground for the wharf which he planned to build. Christopher Gadsden completed the construction of his massive wharf in 1768. His 'stupendous work' inspired other merchnts and factors to invest in similar construction ventures (Bridenbaugh 1955:138).

By the Revolutionary period, a series of substantial brick and wooden structures were on the western portion of the waterfront. Cartographic sources reveal that approximately 150 feet of marsh had been filled in and docks extended an additional 250 feet into the Cooper River. Wharves also extended northward. A line of substantial wharves stretched from Water Street to Craven's bastion and a series of three wharves were built just north of the market, opposite Guignard and Pinckney streets.

The encroachment on the Cooper River by fill and wharves continued throughout the first half of the 19th century. By 1852 a solid line of wharves extended from Water Street to Society Street. The filled land now appears to have extended 400 feet with wharves continuing to a distance of 900 feet. The construction of portions of Concord Street in the 1860s indicates that the first 400 feet were indeed solid land by this time. A strip of marsh separated Bennet's Wharf at Society Street from the enlarged and subdivided Gadsden's Wharf between Laurens and Calhoun streets. Wharves were also located sporadically as far north as Chapel Street. Today, most of the wooden wharves extending into the Cooper River are gone; the made land between East Bay and Concord Street was the site of incremental filling and occupation up to the present time.

The Charleston Data Base

The development of archaeology in Charleston parallels the development of urban archaeology in much of the United States. Investigations began with a few small-scale, isolated projects, essentially descriptive in nature. A number of research efforts initiated in Charleston in

1981 served to bring the city into the mainstream of the urban archaeology of the 1980s. These included initiation of large-scale, federally-funded excavation and subsequent monitoring of the Charleston Place site (Honerkamp et al. 1982; Zierden and Hacker 1987), expansion of artifact studies (Herold 1981; Singleton 1984), and the initiation of archival research for preparation of an archaeological plan, sponsored by the City (Zierden and Calhoun 1982, 1984; Calhoun and Zierden 1984; Calhoun et al. 1982).

The archival research served as an archaeological survey of the city, for the purposes of predicting site location, type of activity, and length of occupation throughout the city. The project was funded by Community Development Grants from the City and matching Historic Preservation Grants administered by the South Carolina Department of Archives and History. Based on the length and density of human occupation of the urban center, the entire peninsular city below the cross-town is considered a contiguous archaeological site, with many components, defined on the individual lot or project level. In order to expand research efforts, a similar documentary study focusing on the 19th century suburbs of Charleston Neck was completed. The project concentrated on the development of 19th century suburban areas and on Charleston's industrial growth, with particular attention to the city's African American population. Many of the original research questions were refined and new ones proposed.

A product of this research was the formulation of long-term, overarching research topics for the urban archaeology program at The Charleston Museum (Zierden and Calhoun 1984; Rosengarten et al. 1987). In the ensuing years, this approach has proved successful, as most of the archaeological projects in the city, including the Atlantic Wharf study, are small in scale. By addressing broad anthropological questions on a continuing basis, the individual projects are united in a comparative framework, making each inclusive and cumulative (Zierden and Calhoun 1986; Reitz 1986; Singleton 1984; Zierden and Herman 1996; Zierden 1997, 1999). Research topic selection for individual projects is based on the scale of the project, as well as temporal and functional affiliation of the site.

Following completion of the city plan, excavations focused on sites located in the colonial commercial core. Occupied since at least the early 18th century, most of the sites served a dual function as businesses and residences, while others served a commercial, or at least public, function. All experienced multiple building episodes, and often the function and/or configuration of the property evolved. The limited time available for historical research on these projects provided a general site history, but illustrated several limitations. With incomplete knowledge of site occupants (often different from owners) and activities, equation of specific excavated proveniences with specific occupants, the traditional approach in historical archaeology, was difficult.

With this avenue closed, both in Charleston and in other urban areas, consideration of new methods commenced. The incomplete site histories were combined with general data on the growth and development of the city to formulate a 'neighborhood' level of study (Honerkamp 1987; Zierden and Calhoun 1986; Honerkamp et al. 1982, 1983). Based on then-current state of

knowledge, similarities as well as differences among the assemblages became apparent. Taken together, the sites revealed a general pattern for dual-function sites in the city. The Atlantic Wharf refuse, then, is considered as a 'neighborhood' assemblage, not attributable to individual household units.

Beginning in 1985, research shifted from dual-use sites in the commercial core to townhouses in the residential areas of the city. These historically residential sites were less complex, better documented, and thus less ambiguous in traditional archaeological terms. Since 1985, twelve such sites have been examined, some extensively. The data from these sites have provided a measure of elite and middle-class daily life in the city, and serve as a source of comparative data for the Atlantic Wharf refuse. References for all of the relevant individual site studies may be found in the bibliography (figure 1).

Research Approaches

When conducted in 1983, the Atlantic Wharf project was only the third urban study conducted by the author. In the ensuing years, this list has expanded to nearly 30 projects, with continual refinement of methods and results. The project remains only one of two conducted by The Charleston Museum in the filled land east of East Bay Street. In 1979 Elaine herold excavted waterfront deposits beneath the Exchange building at the foot of Broad Street (Herold 1981). Zierden also encountered these deposits on the building's interior in 1985 (Zierden and Hacker 1986) A more recent study in this area, however, was conducted in 2000 by New South Associates of Atlanta, Georgia, under the direction of Dr. Joe Joseph. This excellent study was conducted a block east of the Atlantic Wharf garage, on land that shares ownership history with Atlantic Wharf. This report, then, follows from the excellent work of Joe Joseph, Theresa Hamby and Jennifer Langdale on the Vendue/Prioleau project, and relies heavily on their study (figure 2).

The Vendue/Prioleau project used mechanical equipment to open large areas for recovery of data on the appearance and form of early wharves, the processes and material used in land filling, and the architectural adaptations used for building on fill (Joseph et al. 2000:1). As the fill encountered contained principally architectural debris, relatively little in the way of cultural materials were retrieved. The Atlantic Wharf project thus complements the Vendue/Prioleau project, in that the focus of research was the fill materials, with lesser attention paid to the architecture of the wharves. Indeed, our limited ability to lower the groundwater precluded detailed examination of the wharf materials evidently well-preserved below the water table.

The focus of the analysis of the Federal-period midden sampled at Atlantic Wharf is three-fold. First is analysis of refuse disposal practices by city residents as exhibited in communal dumps. Second is consideration of the unique aspects of the assemblage relative to the waterfront location, particularly the retrieval of exotic (Spanish, French, and Caribbean) artifacts and ecofacts in proportions not seen elsewhere in the city. Third is a consideration of urban health and sanitation, particularly the presence and control of vermin, as reflected in this assemblage. These issues are discussed in detail in the final chapter of this report.

Figure 2
Waterfront sites excavated in Charleston (in relation to the walled city)

A. Exchange building/half moon battery

B. Atlantic Wharf site

C. Vendue/Prioleau site

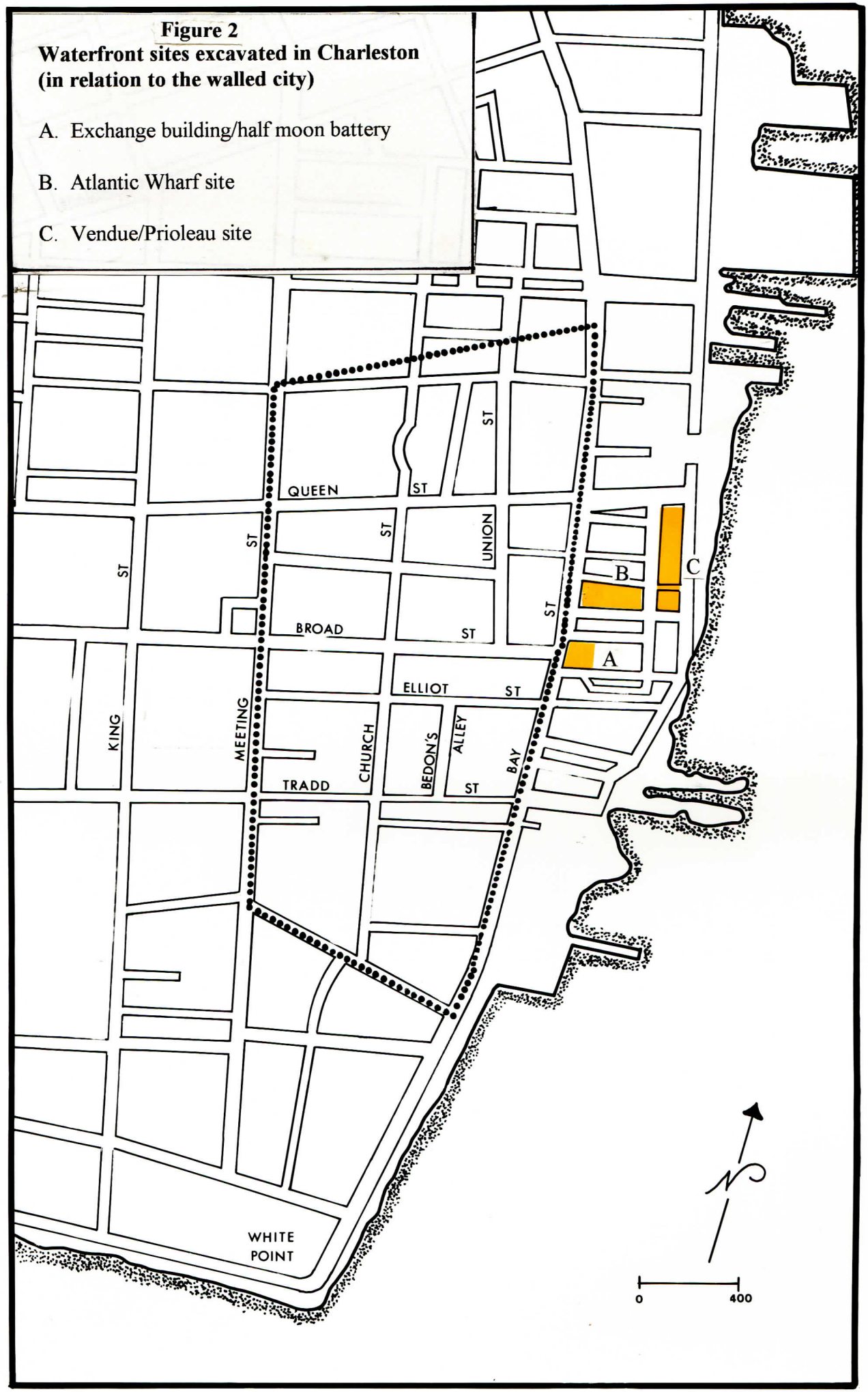
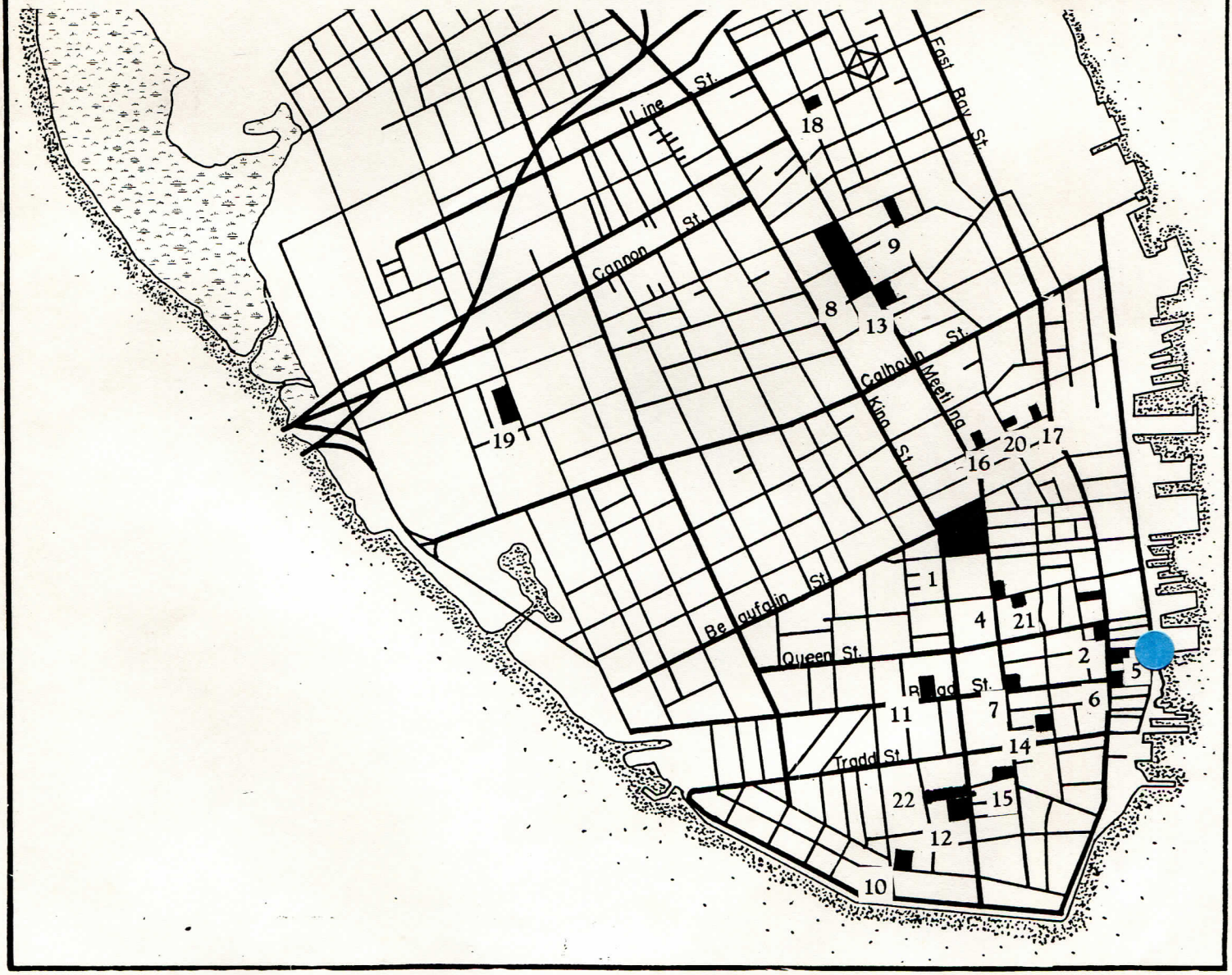


Figure 1

Sites Excavated in Charleston

Dual-Function sites	Town-house sites	Single-house sites
1. Charleston Place	9. Aiken-Rhett	16. 66 Society St.
2. McCrady's Longroom	10. William Gibbes	17. 40 Society St.
3. Lodge Alley/38 State	11. John Rutledge	18. 70 Nassau St.
4. First Trident	12. Miles Brewton	19. President St.
5. Atlantic Wharf	13. Joseph Manigault	20. 72 Anson St.
6. Exchange building	14. Heyward-Washington	
7. Beef Market	22. 14 Legare St.	
8. Visitor's Center		
21. Powder Magazine		



Chapter II
The Charleston Waterfront

Relatively little specific research has been conducted on the buildings and facilities of Charleston's 18th and 19th century waterfront. The following summary derives from a title search of the Atlantic Wharf site conducted in 1983, but not completed, by Jeanne Calhoun of The Charleston Museum. This, plus Calhoun's research on the city in preparation of a research design, and on other sites, provides a basis for discussion of the waterfront (Zierden and Calhoun 1984; Calhoun and Zierden 1984; Calhoun et al. 1982) The more detailed research on this area by Jennifer Langdale of New South Associates for the Vendue/Prioleau project in 2000 included the portion of the Atlantic Wharf tract just east of the 1983 project area. The southern portion of the Vendue/Prioleau tract, then, shares the same site history with the Atlantic Wharf garage. The following description draws from the excellent research conducted by New South Associates (Joseph et al. 2000). Additional data are derived from archaeological research on other waterfront sites in Charleston (Herold 1981, Zierden and Hacker 1986) and elsewhere (Faulkner et al. 1978; Huey 1984; Mrozowski 1985, Lewis Berger Group 1987; Reed et al. 1995).

The Colonial Seaport

The Carolina colonists' reasons for moving their new settlement from Albemarle point to the current site included the idea that the peninsula was "ideally cituated for trade" (Matthews 1954:153; Calhoun 1984:33). Located at the confluence of the Ashley and Cooper rivers and the Atlantic Ocean, the new town possessed a good, though somewhat shallow, harbor. The Cooper River was the more navigable of the two, as it was wide, deep, and relatively free of shoals. A strip of relatively high bluffs and narrow marsh, with its suggestion of a nearby river channel, on the Cooper River was selected for the initial settlement. The new town, eventually walled for protection against the Spanish, French, and Native Americans was located between two major creeks, now Water Street and Market Street. The walled city encompassed the areas between Water Street, Meeting Street, Cumberland Street (roughly) and East Bay Street (figure 2).

During the first decade of Charleston's existence (1680-1690), most captains of ocean-going vessels used lighters to carry their goods to the town's docks. In the 1690s, however, those areas along the shoreline deep enough for large ships were converted to wharves. By the time of Crisp's map of the city in 1704, two wharves (or bridges) were shown projecting into the Cooper River from the brick seawall, or curtain, along East Bay Street (figure 3).

One task facing the early settlers of Carolina was to find a profitable commodity to trade. Early experiments in the cultivation of such staples as wine, silk, and oranges proved disappointing. While experiments in husbandry continued, "beefe and porke" became the main export of the colony, much of the meat shipped to New England, Jamaica, and Barbados. During this period, servants and slaves often worked as ranchers (Edgar 1998:134; Brooks et al. 2000).

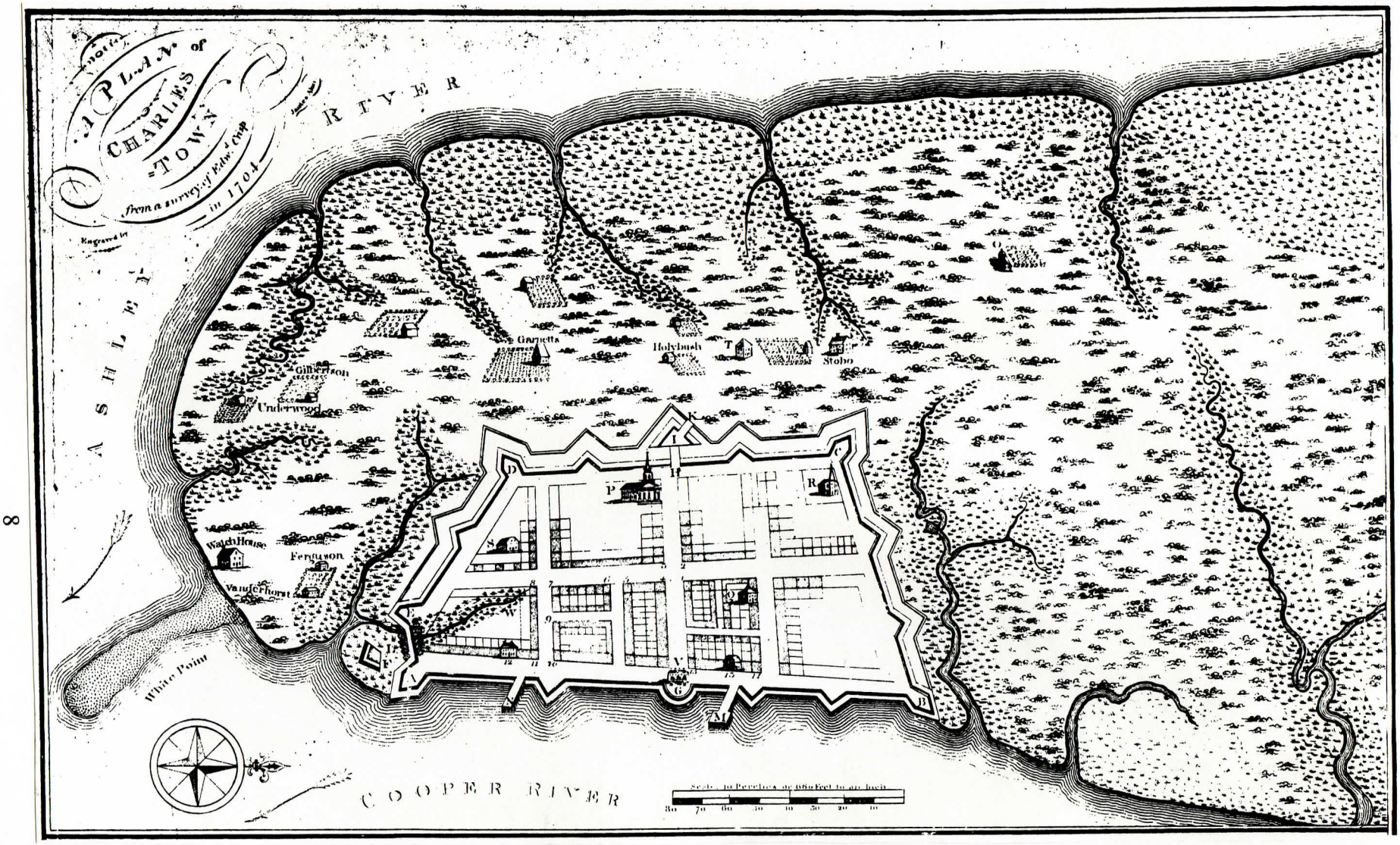


Figure 3: Crisp map of Charleston, 1704

The economy of Charleston in the late 17th century was based upon an intercolonial trade with the Caribbean in foodstuffs and lumber, as well as the export of deerskins to England.

The deerskin trade with Native Americans soon proved profitable, and many aspiring planters engaged in casual trading with nearby native residents. Native Americans had long managed the south Atlantic forests for deer and agriculture by selectively clearing and burning portions of the longleaf pine and hardwood forests (Cronon 1983; Lefler 1967; Silver 1990) Some of these aspiring entrepreneurs hired an Indian hunter to supply them with skins while others traded with whomever wandered by (Crane 1981:118; Weir 1983:16-17). Between 1699 and 1715, approximately 200 traders sent, on the average, more than 53,000 skins a year to England (Weir 1983:143). These commodities passed through the port of Charleston, and many skins were tanned in the city, as well (Bridenbaugh 1955:76; Calhoun et al. 1984).

This informal network was radically altered by James Moore's raid of St Augustine in 1702 and the Spanish missions in 1704 (Arnade 1959; Hann 1988), as well as the Yemassee War of 1715. This final defeat of the coastal Indians caused the remnants of the tribes to retreat inland, culminating two centuries of movement, dislocation, and realignment sparked by the first European contact (DePratter 1990; Merrell 1992). The movement of the defeated Indians and the expansion of the Indian trade into the interior of the Southeast changed the mechanics of this enterprise; those settlers involved in the fur trade found it more difficult to obtain skins and were forced to invest in extensive storage facilities. Soon the trade was transformed from one operated by a number of individuals on a small scale to a capital-intensive industry controlled and dominated by the burgeoning mercantile community in Charleston. These merchants established credit relations with British businessmen, enabling them to procure and finance the trading goods necessary for the bartering carried on with the Indian hunters (Merrell 1989; Braund 1993). The recognition, power, and wealth that many of these merchants achieved made it possible for them to become involved in other trades as the 18th century progressed - slaves, naval stores, provisions, and rice (Calhoun et al. 1992:2; Earle and Hoffman 1977:37),

Expansion of the Port

The decade of the 1730s witnessed Charleston's transformation from a small frontier community to an important mercantile center. When royal rule replaced the inefficient propriety government in 1719-1729, Carolina entered the mainstream of the British mercantile system. Defeat of the coastal Indians in the Yemassee War and the reduction of the Spanish threat allowed white colonists to develop outlying communities; begun in the 1690s, this settlement accelerated in the 1730s following passage of the Township Plan. This brought new people to the Carolina frontier and an influx of products from the backcountry. Lowcountry settlers, meanwhile, had discovered rice as a profitable staples. Enslaved laborers from Africa, imported in increasing numbers, worked the growing rice plantations of the lowcountry. Exported rice flowed through the port of Charleston.

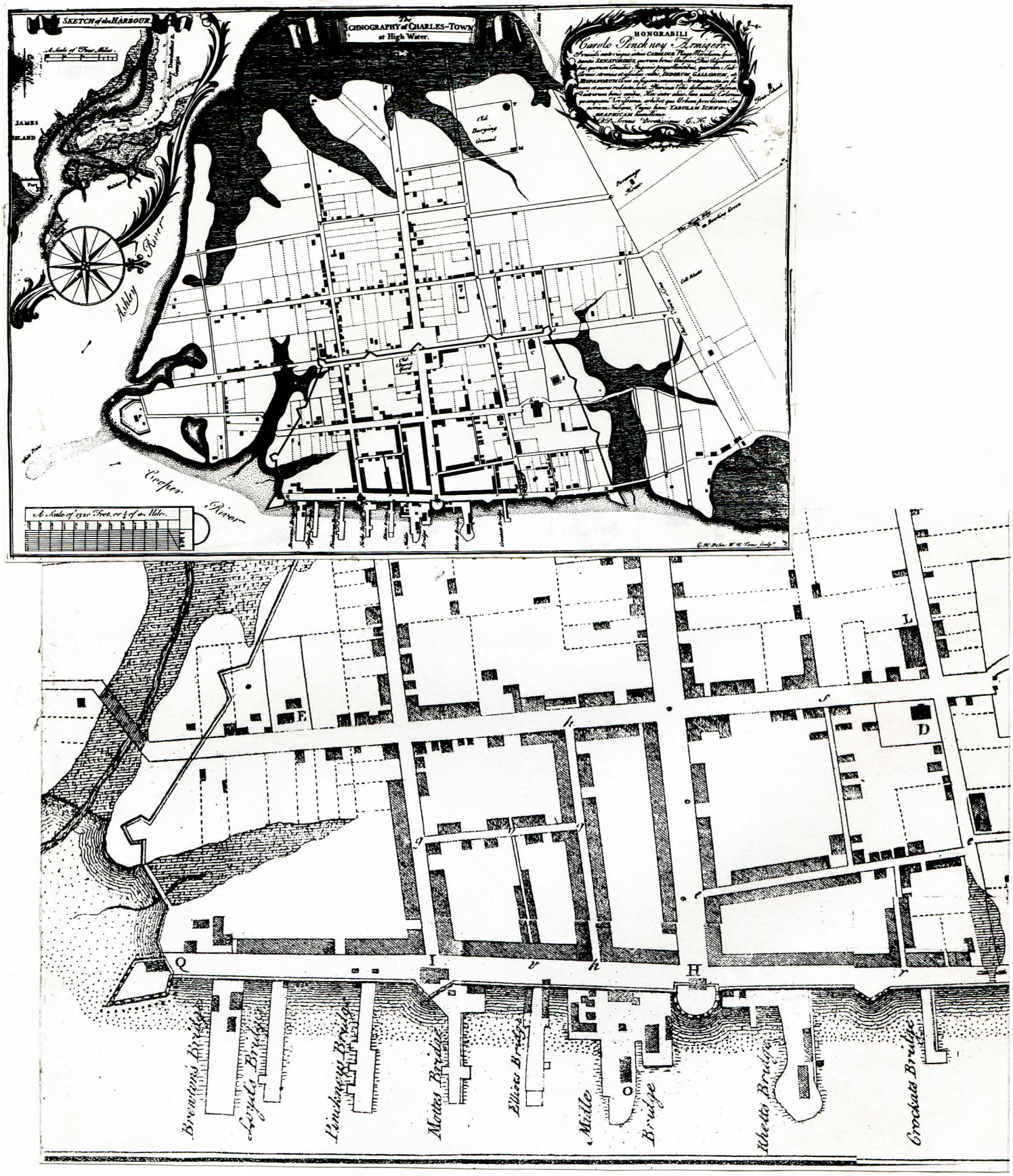


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Figure 4: 1739 map of Charleston, close-up of the waterfront

During this period, merchants emerged as a distinct group; further, they began to invest their earnings in the local economy instead of returning to England after making their fortunes (Rogers 1980; Stumpf 1971). Charleston's economic expansion was matched by physical expansion. By the time Roberts and Toms drew their map of 1739 (figure 4), the city had grown well beyond the city walls, and development was primarily to the west (Calhoun et al. 1982). The city spread to the banks of the Ashley River and south to the tip of the peninsula, though much of the peripheral area was sparsely occupied.

The colonial city focused on the waterfront. The 1739 Bishop Roberts engraving (figure 5) of the harbor shows post-medieval and Jacobean structures along Bay street; these are multi-storied and substantial, and the streetfront is crowded (Poston 1997:25). Merchants clustered on Bay Street and on three principal east-west thoroughfares leading from the waterfront; Broad, Elliott, and Tradd streets (Calhoun et al 1982). In the 1730s, 20% of the advertising merchants were located on Broad Street; the thoroughfare retained this prominence throughout the colonial period. Nearly 26% of the merchants advertising in the *South Carolina Gazette* operated shops on East Bay Street, and another 14% eventually maintained shops directly on wharves. Following the fire of 1740, the southern portion of the city was rebuilt in a diverse architectural style, one typical of English port and market towns (Herman 1997:38). Both row houses and Georgian townhouses combined commerce and residence in a single dwelling. Herman notes that the most common form included a street-level shop in front, with general living spaces behind and 'best' rooms above.

Figure 5: Bishop Roberts engraving of the Charleston Harbor, 1739

The 1739 etching and map also show considerable development of the wharves, or bridges, along the waterfront (figure 3). Eight wharves are shown on these figures, located between Granville's bastion (at the foot of Water Street) and Queen Street. The western half of these features was apparently dry at low tide. As Charleston gained in economic importance, more and more of these structures were built. The growth of the town resulted in the filling of marsh and creeks, such as those bordering the walled city. Some were filled casually with trash and debris; others were filled deliberately, as when Christopher Gadsden advertised in the 1760s for ship's ballast to provide solid ground for the wharf he intended to build (Bridenbaugh 1955; Zierden and Calhoun 1984). Except for the public landing at the Exchange Building (built in 1761), wharves were privately owned in Charleston (Joseph et al. 2000:4).

Joseph et al. (2000) and others describe the methods of constructing colonial wharves. Unlike those of the 20th century which are suspended on pilings, the colonial structures resembled stone breakwaters. Joseph suggests that cribs of palmetto logs resembling long cabins were built on shore and floated to their desired location. Several were placed in a line running towards land and were then filled with stones (usually ship's ballast), until they sunk (Coker 1987:42; Joseph et al. 2000:4). This line of sunken cribs was connected on the surface by a wooden walkway. Carl Lounsbury suggests that such wharves lasted several years (Lounsbury 1994:403). Some Charleston wharves were further protected by granite stones placed in a curtain or wall around the cribs.

Buildings were constructed on the wharves. They mostly consisted of storehouses where goods could be counted, shipped, purchased, and kept dry. The 1739 Roberts and Toms map shows one of the eight wharves in the location of the Atlantic Wharf tract. Rhett's bridge was evidently one of the largest and featured several large, linear buildings, probably storehouses. If this map is accurate, then one of these was likely in the center of the eastern portion of the Atlantic Wharf block. Very little is known about Rhett's bridge (Joseph et al. 2000:9).

Joseph et al. suggests that buildings on wharves were regulated by the House of Assembly. The first pertinent law actually pertained to the curtain line, or sea wall. Issued in 1700, it required persons holding lots on the "Bay of Charles Town" to build a brick wall before their land and keep it in repair at their own cost. They were given permission to build wharves to the low water mark, but were not allowed to erect any houses or buildings. This law was renewed in 1718, but laid aside in 1725, when a provision was made for those "Persons having right to any of the lots to the Eastward of the Front Wall to build and erect on the Flats or Bridges built or to be built, Cranes, Crane Houses, and Ware Houses not exceeding ten feet in height" (Libscomb and Olsberg 1977:53 in Joseph et al. 2000:5). A revision to this law in 1736 raised the height of the structures to sixteen feet. It also allowed the parapet to be opened on Bay Street "for all Bridges that extended twenty Feet beyond Low Water Mark..." The openings could be fifteen feet in width, "convenient for...communication of said Bridges with the said Bay Street." Danger of fire prompted a 1738 law requiring a fifty foot buffer between the curtain line and any buildings (Stevens 1988:502 in Joseph et al. 2000:5).

The Commercial City

As the 18th century progressed, more and more wharves were built. Government officials who felt the increased openings in the curtain line left the city vulnerable to attack were over-ruled by those who felt closing the openings would impede trade. The massive hurricane of 1752, however, completely destroyed the waterfront (Calhoun 1983) as well as the goods stored on the many wharves and store houses (Herold 1981). The brick seawall itself evidently suffered considerable damage (Herold 1981). It is likely that all of the wharves shown on the 1739 map were destroyed and rebuilt after 1752.

The rebuilding after the 1752 hurricane coincided with Charleston's economic heyday. Joseph et al. (2000:6) notes that there were seventeen wharves by 1770. Commerce was interrupted by the American Revolution, but business was reviving by 1780. In 1786 the City made plans to widen East Bay Street to sixty-six feet (figures 6 and 7), and wharf owners were permitted to build "convenient Brick Houses, to be covered with Tile", in return for providing the land "east of the Curtain Line" for the road (Stevens 1988:502 in Joseph et al. 2000). Another law in 1787 may have encouraged infill of underwater sections. The 1788 Petrie map of the city shows twenty-two wharves covering nearly every open space along the Cooper River (figure 8). Thomas Cochran owned the wharf covered by the Atlantic Wharf property. Joseph et al. note that Cochran was operating a wharf as early as 1785 (figure 9). In 1789, Cochran and his neighbors, Samuel Prioleau, John Blake, and John Champneys agreed to lay out a street along their whaves called Prioleau Street. (On the 1788 map, Samuel Prioleau's wharf is number 92, Cochran's is number 91, and John Champneys is number 89. The wharf numbered 90 is listed as "Jervey's wharf"; Jervey may have sold his tract to John Blake a year later.) Prioleau Street runs from Queen Street nearly to the foot of Broad Street (see figure 10).

In 1803 Thomas Cochran died and his wharf was sold in 1810 to Simon Magwood, an Irish immigrant who came to Charleston after the Revolution. Some years later, Magwood constructed a modest house on Smith Street (Poston 1997:565). The Magwood family owned the wharf for forty-six years. A plat of the property discovered by Jennifer Langdale suggests the wharf was of relatively moderate size, with two stores, both likely located on the Atlantic Wharf tract. A small passageway from East Bay Street to the wharf may have become North Atlantic Wharf street (Joseph et al. 2000:16). A similar plat drawn in 1841 shows little change to the property (figure 11). These maps suggest the property was completely filled by the early 19th century. Filling of the wharf space to the east occurred throughout the second half of the 19th century.

Though some progressive citizens of the 19th century encouraged industrialization and diversification, Charleston's economy remained linked to cash crops and the plantation system. Examination of the city's economy following the economic depression of the 1820s proved ominous. Import trade had decreased 51%, and exports had dropped from $11 million in 1816 to 7.5 million in 1826. Charleston's cotton trade had increased 42% in the 1820s, but this gain was

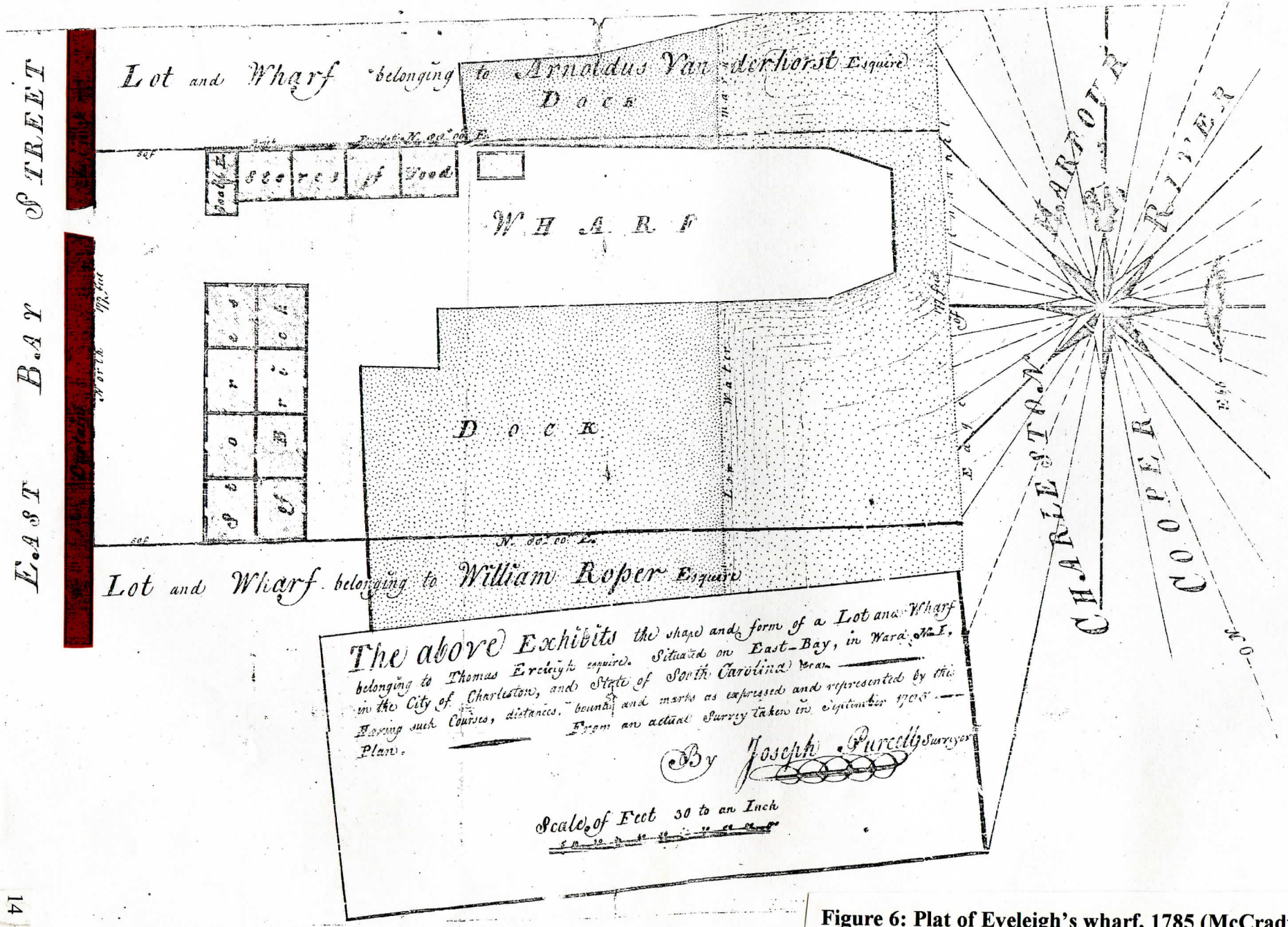


Figure 6: Plat of Eveleigh's wharf, 1785 (McCrady Plat 1211)
(note curtail line along East Bay Street)

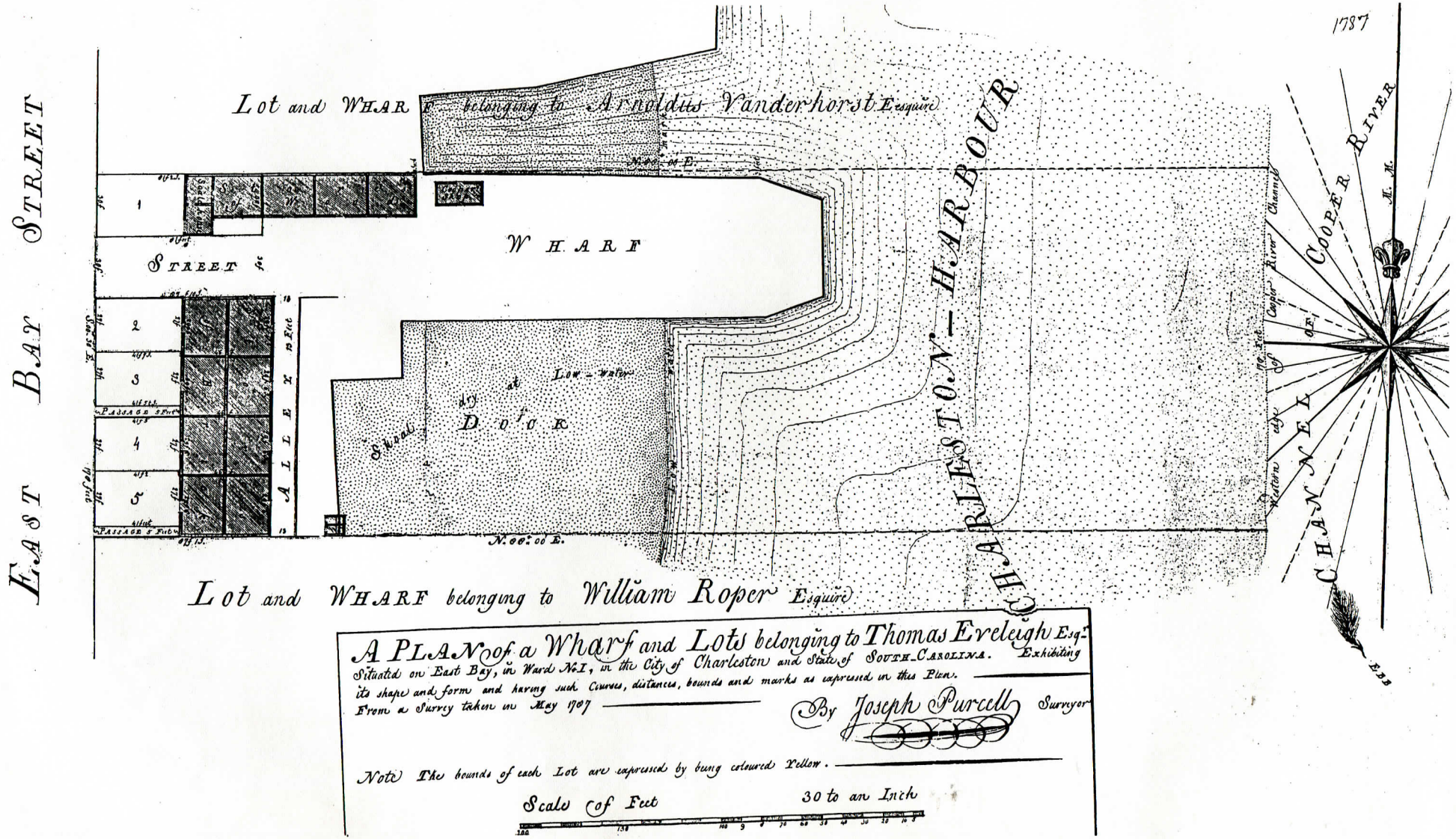


Figure 7: Plat of Eveleigh's wharf, 1787 (SCHS 32-31-15)
(note that curtail line is gone)

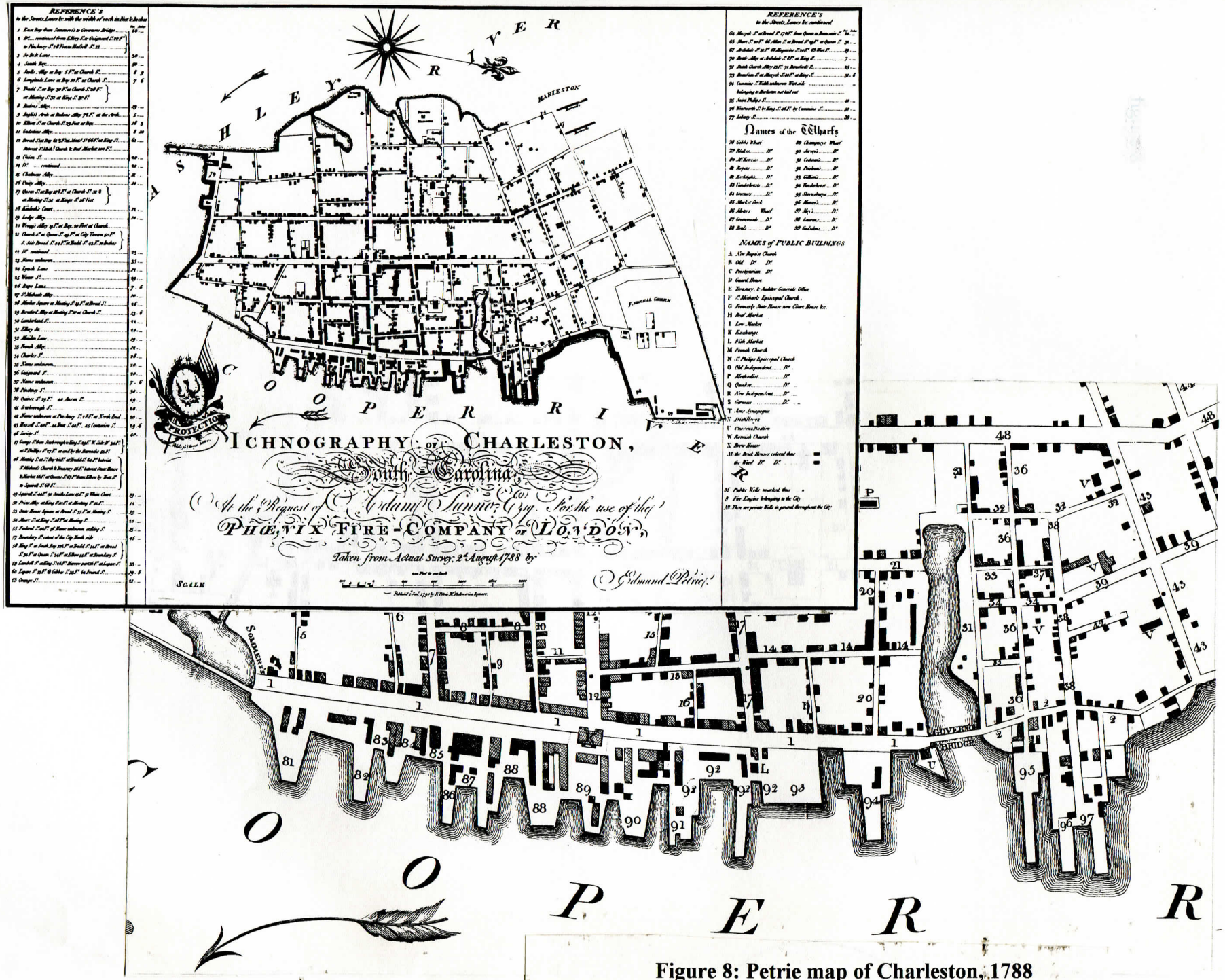


Figure 8: Petrie map of Charleston, 1788 close-up of the wharves

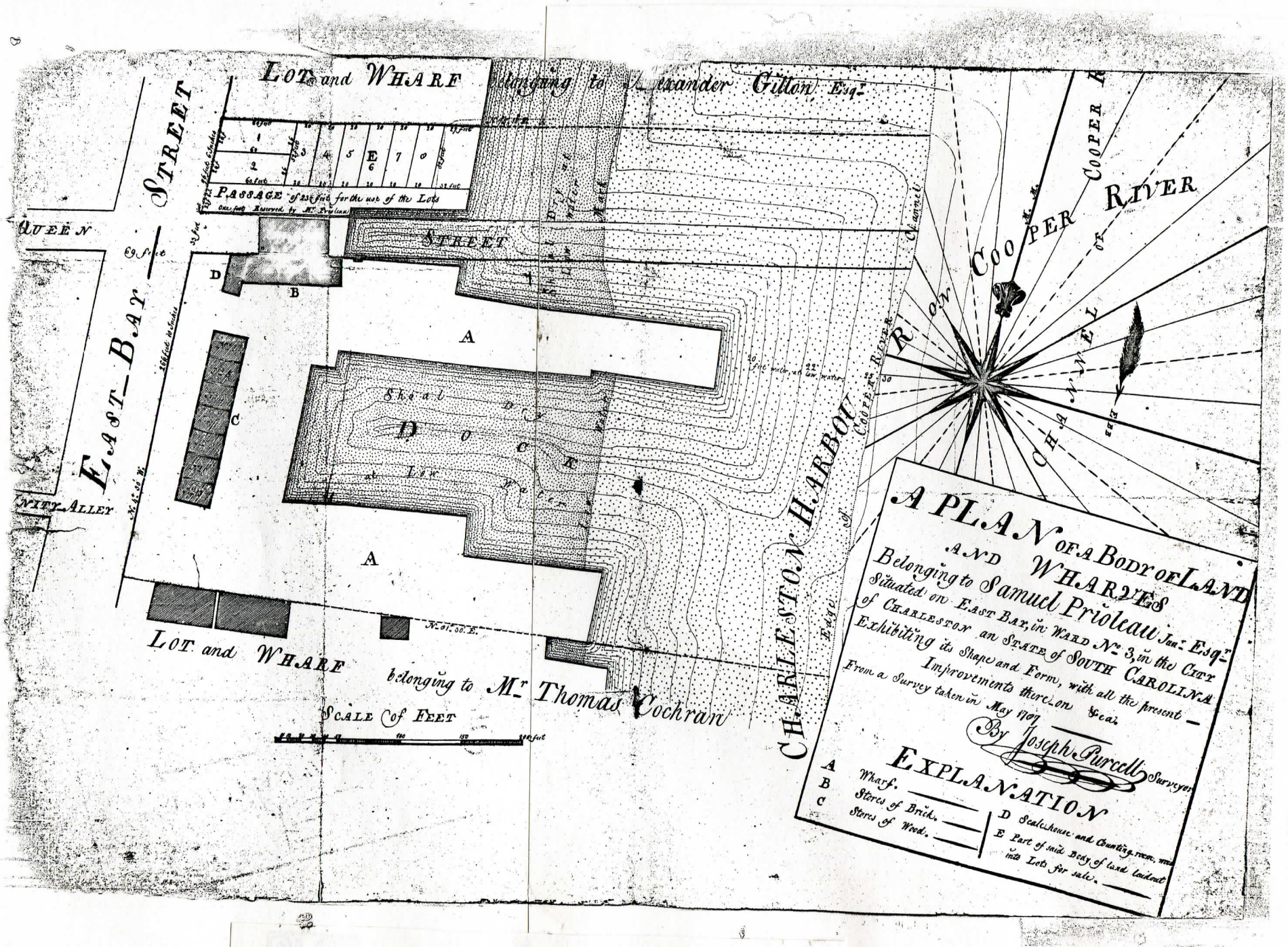


Figure 9: Plat of Prioleau's wharf, 1787 (McCrady Plat 622)

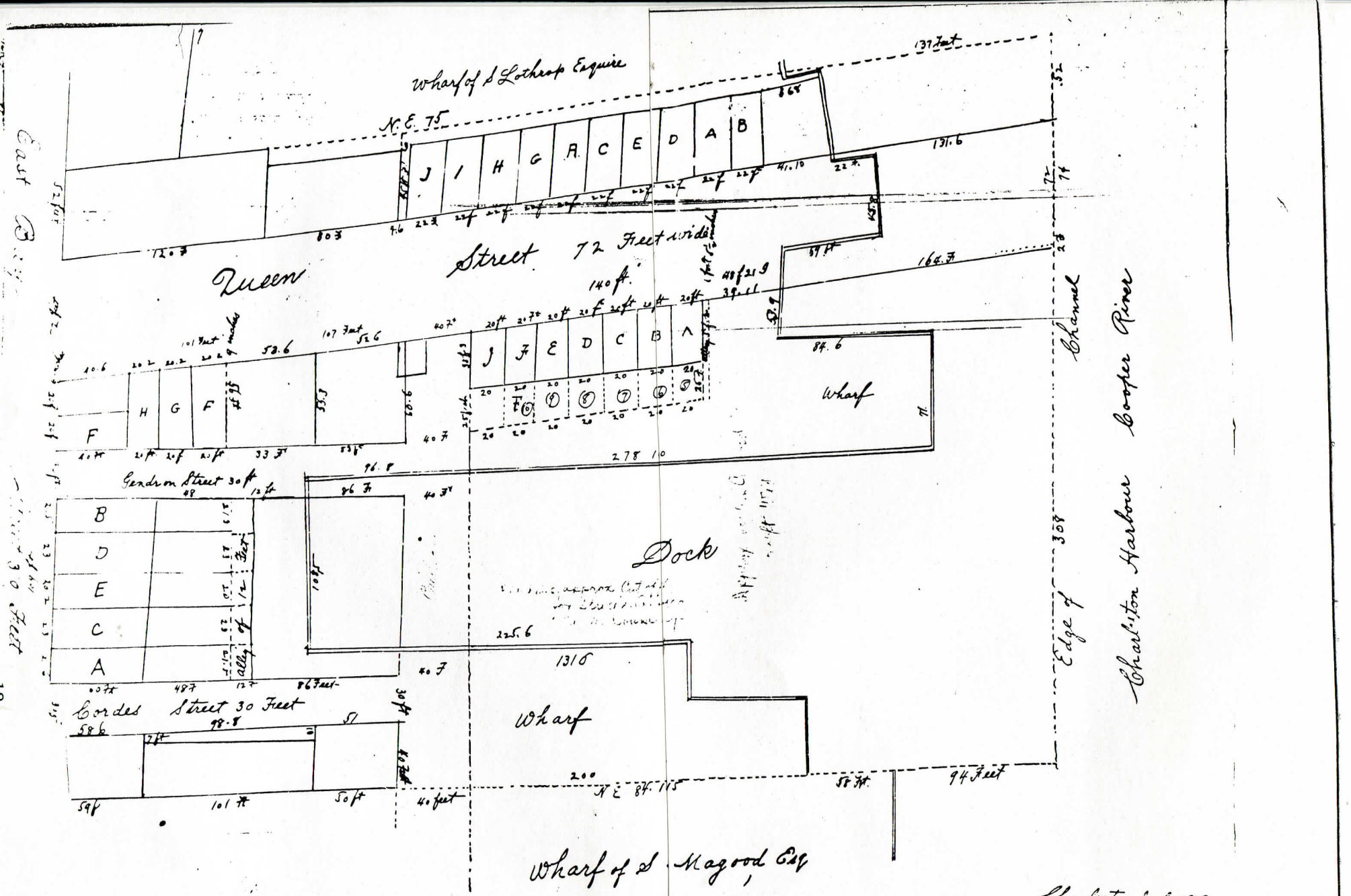


Figure 10: Plat of Prioleau's wharf, 1816 (CCRMCO V8:372)

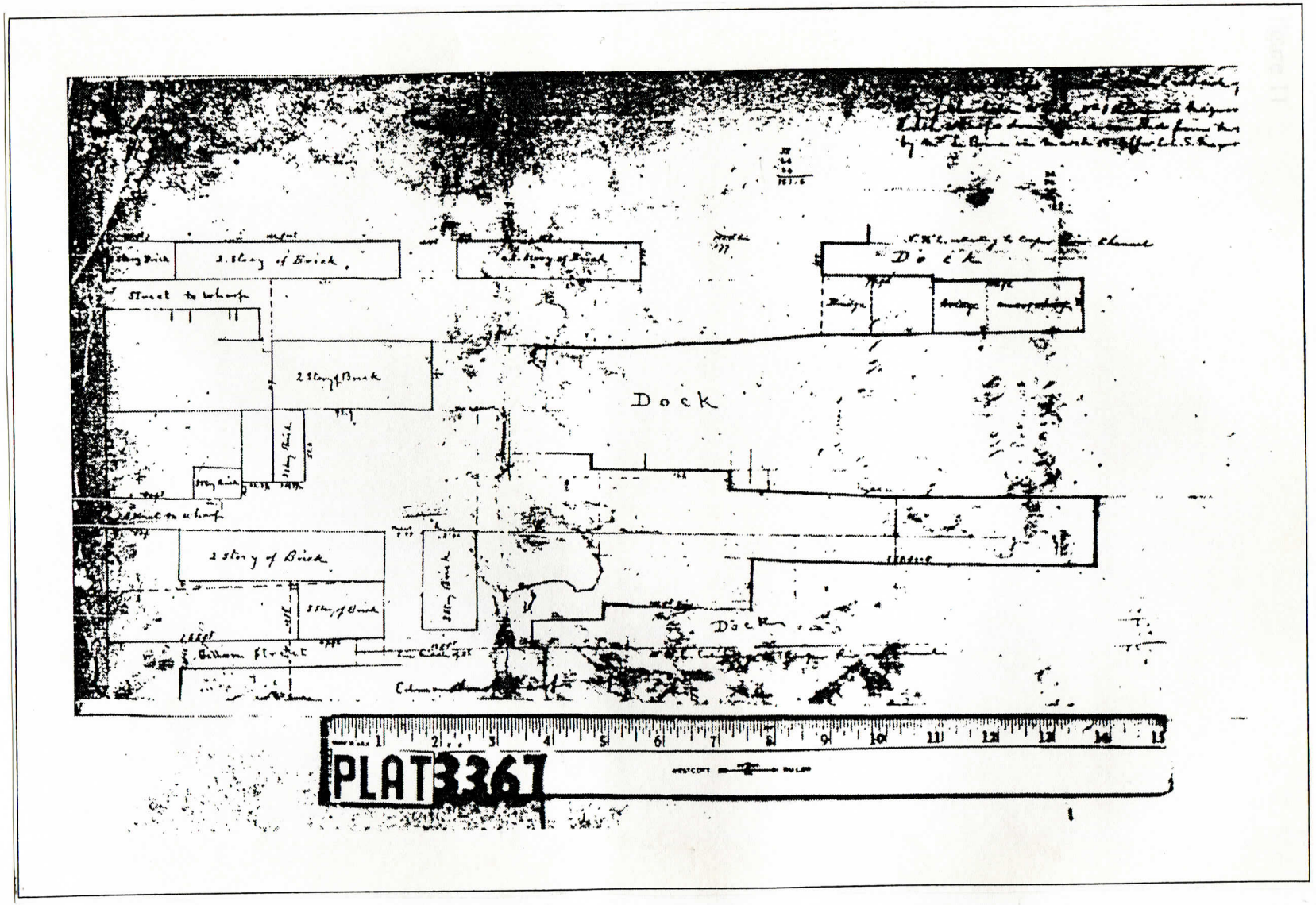


Figure 11: Plat of Magwood's wharf, 1841 (from Joseph et al. 2000)

only half that of adjoining states. Moreover, new towns along the Fall Line used rivers to connect them to ports which had railroad links. The progressives realized that the key to renewed trade was better transportation.

But those enterprises built between 1830 and 1850 were not successful in reversing Charleston's trade fortunes. Those new economic enterprises that did develop were often located in the Neck, above Calhoun Street. Such was the case with the railroad lines, as terminals were built at Line Street and later at Mary Street. This created a gap between the rail lines and the wharves. Rivalry among wharf owners as to whose wharf would be the terminal further impeded completion of the rail lines. The draymen and wharfingers who then hauled goods from the rail depots to the wharves also opposed line construction. Lines connecting the Neck to the wharves would remain unbuilt through the Civil War, and were not in place until 1881 (Fraser 1989:304).

Decline and Revitalization

Charles Magwood, likely Simon Magwood's son, sold the wharves to Otis Mills and and Erastus M. Beach in 1849. They changed the name to Atlantic Wharves, the same title that appears on the 1852 Bridgens and Allen map of the city (figure 12). The 1852 map shows the Atlantic Wharf tract now covered with buildings oriented east/west, likely storehouses. The tract remained occupied in this fashion throughout the 19th century. The 1884 Sanborn map lists a row

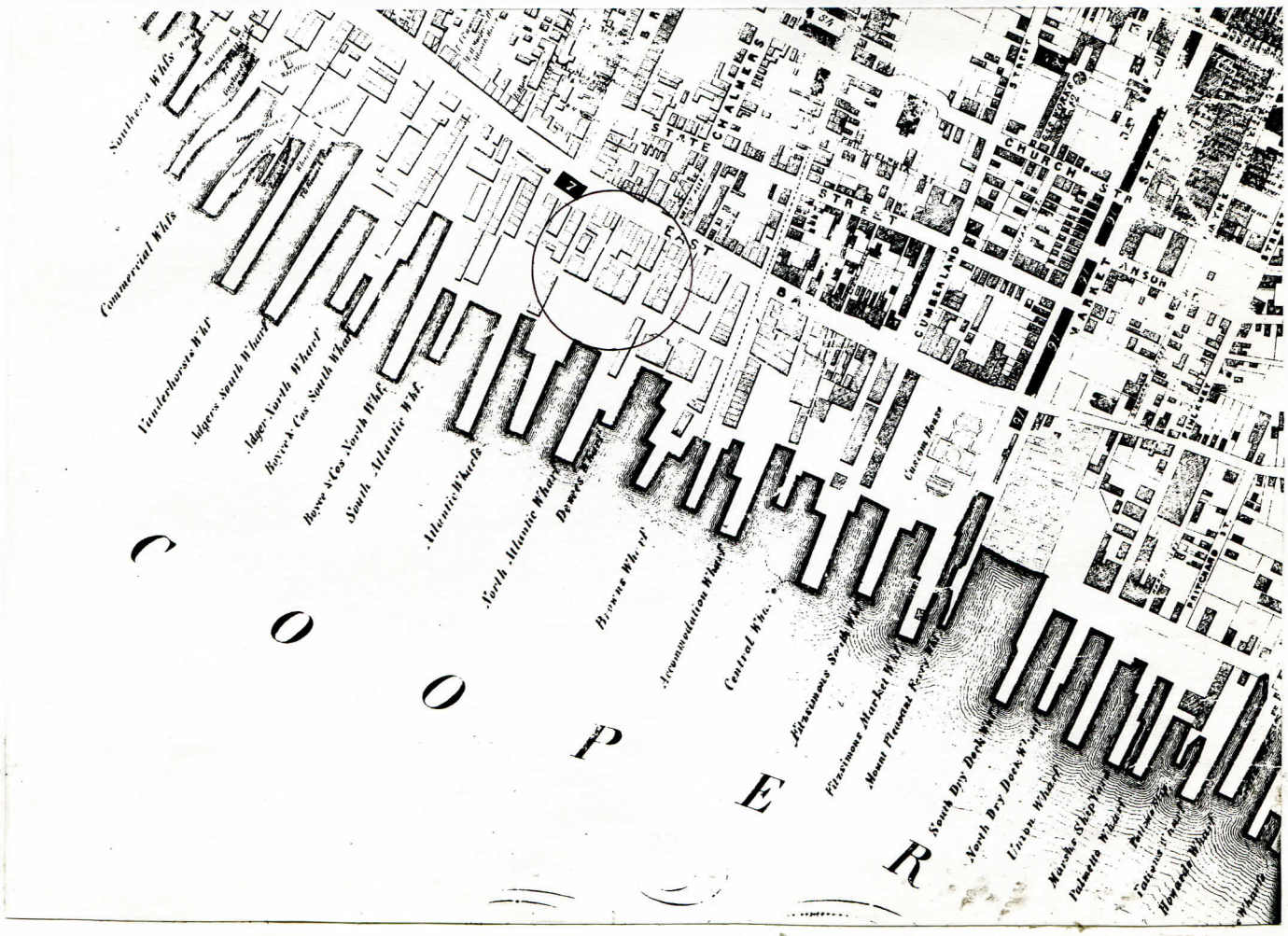


Figure 12: portion of the 1852 Bridgens and Allen map: Atlantic Wharf is circled

of buildings fronting East Bay Street as cotton packing houses and a grocery warehouse (figure 13). Three of the six buildings are listed as vacant. The group of four structures on the eastern half of the property are listed as warehouses. The 1872 bird's eye map of the city shows these structures as multi-storied (figure 13). In the early 1890s, the Atlantic Wharves were purchased by the East Shore Terminal Company, and the area was controlled by the railroad for three decades (Joseph et al. 2000:18). During this time, the wharves and their buildings continued to decay as trade remained depressed. The economic depression of the postbellum period and the degradation of the waterfront was exacerbated by a series of devastating hurricanes in the late 19th century and the earthquake of 1886 (Waddell 1983).

In the early 19th century, the wharves and waterfront remained a focal point of the city, and merchants continued to congregate near the waterfront. By the middle of the century, however, King Street had become the retail center Charleston, and the city was somewhat realigned along a north/south axis centered on this overland thoroughfare. The new railroad terminal was built between King and Meeting Street in 1852 (Rosengarten et al. 1987; Calhoun and Zierden 1984). During this time, wharf ownership became consolidated into firms owning larger pieces of real estate. Filling of land and construction of piers continued, but by the turn of the 20th century, many of the wharves were abandoned and became "rotting piles of decaying timbers" (Fraser 1989:343).

Through the 1920s, the Cooper River wharves were controlled by the Terminal Company, a railroad company. They neglected the waterfront, and Mayor Grace campaigned to bring the property under City control. He created the Ports Utility Commission Authority, the local precursor to the South Carolina Ports Authority. The authority has greatly enlarged and modernized the port of Charleston, and it remains the nation's fourth busiest container port (Rosen 1992:141; Joseph et al. 2000:8). The locus of the commercial waterfront activity has shifted north, however, and is now centered on the Cooper between Calhoun Street and the Cooper River bridge. Mayor Joseph P. Riley has continued the city's effort to revitalize the waterfront. The areas between Market and Broad Street still controlled by the City have been revitalized for public and visitor use, including the Atlantic Wharf parking garage and the Waterfront Park

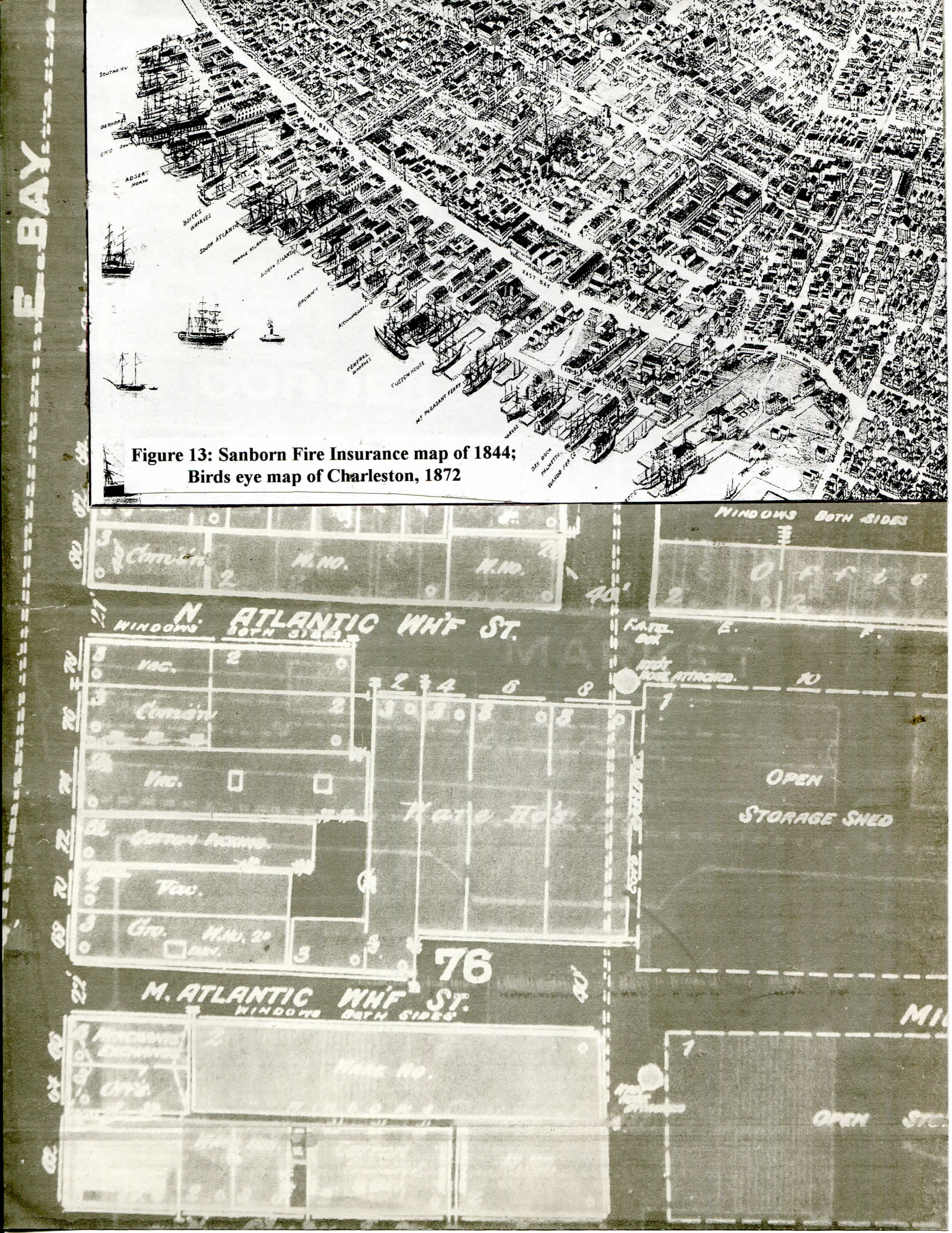


Figure 13: Sanborn Fire Insurance map of 1844; Birds eye map of Charleston, 1872

Chapter III
Field Work: Methods and Results

Site Description

The Atlantic Wharf site consists of as small city block bounded to the north by North Atlantic Street, to the east by Prioleau Street, to the south by Mid Atlantic Wharf Street, and to the west by East Bay Street. At the time of the controlled excavations, the central portion of the block was occupied by a modern one-story brick structure that housed Jenning's Shell Station. Behind this structure, to the east, was a brick wall of presumably 19th century construction, based on the presence of lime mortar and 5-course American bond (figure 14). The entire two-thirds of the block to the west of this wall was covered with concrete and/or asphalt.

The eastern one third of the block was covered with a loose gravel surface. A concrete block garage structure and an open parking shed were located adjacent to the brick wall. The block slopes downward to the east, with the ground surface on the east side of the brick wall generally two feet lower than the western side. Elevations on the block range from 11.69' ms. To 7.92' msl.

At the time of the excavations, the open spaces of the block were used for parking. The eastern third of the block was owned by the Ruscon corporation. Following the closing of Jenning's station, the western two thirds of the block was also used for parking (figure 15).

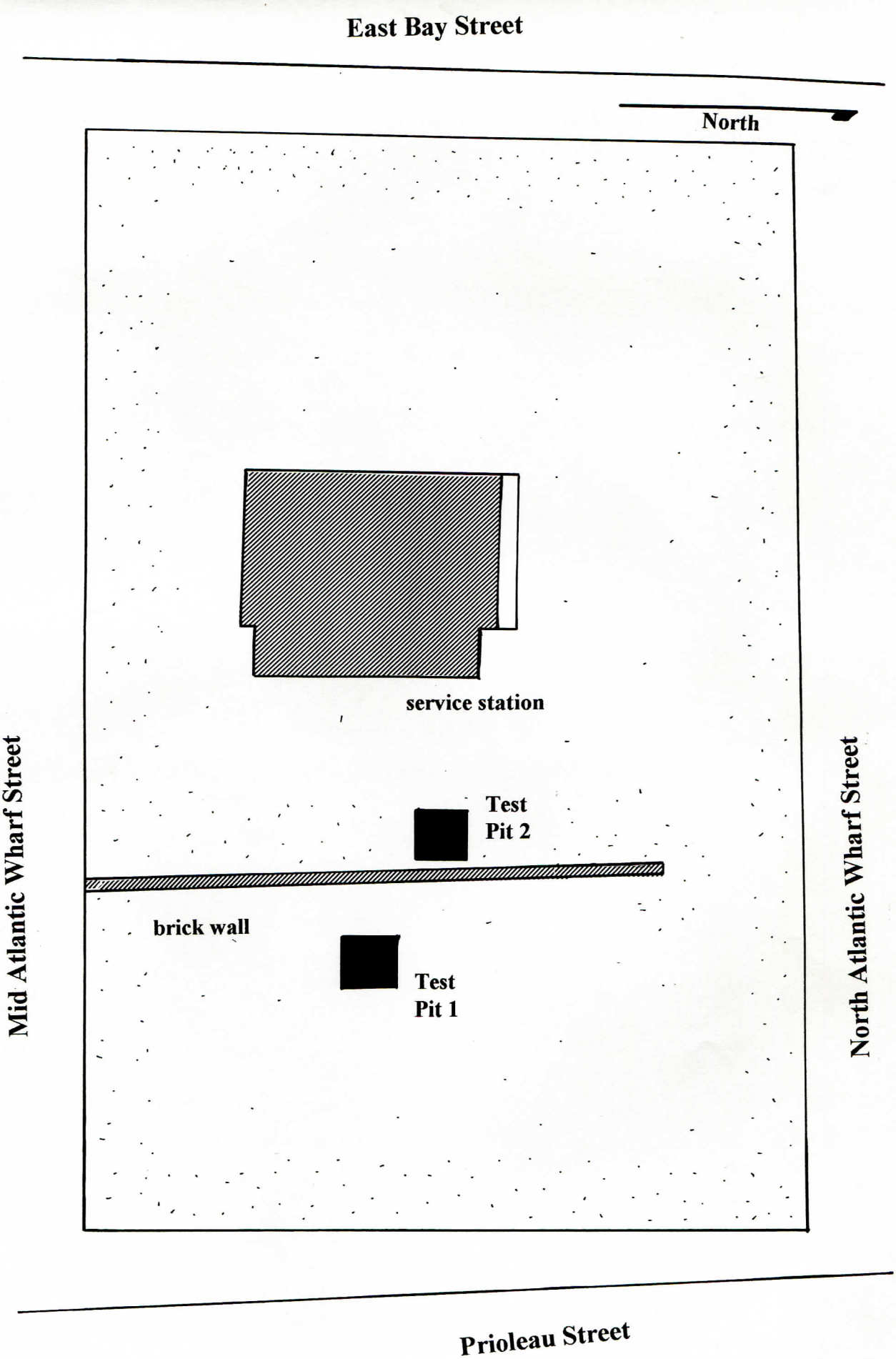


Figure 15: Site map, Atlantic Wharf, showing extant structures and excavation units

Excavation Techniques

Because of the congested nature of the urban site, a Chicago grid was not established site-wide. Instead, a trench-unit grid was used. Excavation units were designated as test pits and were numbered consecutively in order of excavation. Each test pit was located in reference to existing landmarks.

Vertical control was maintained with the use of a transit. Elevations were taken in reference to a datum point established during the pre-construction survey of the block. Several data points were then established in reference to this point. Elevations are presented here as feet above mean seal level (msl).

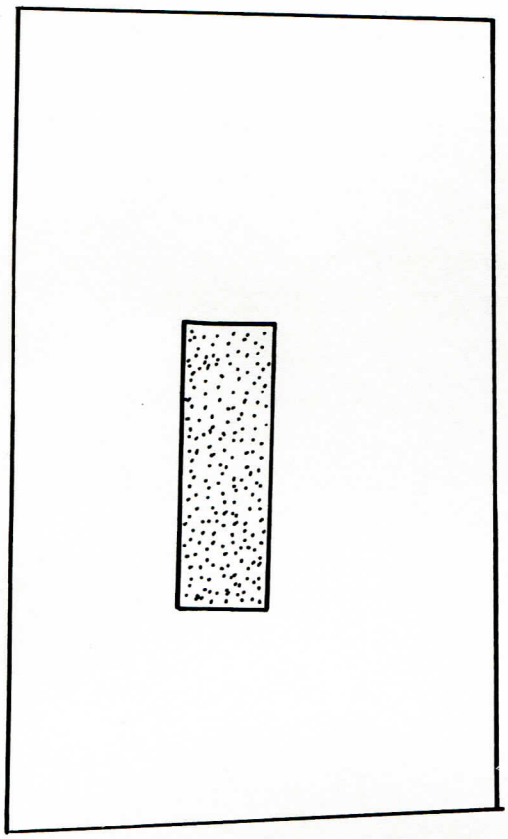
A backhoe was used to remove the overburden from Test Pit 1 and a jack hammer was used for removal of the asphalt and concrete cap from Test Pit 2. With these exceptions, all units were hand excavated using shovels and trowels. All proveniences were water screened through 1/4-inch mesh. In addition, a ½ gallon soil sample was retained from each provenience. A four gallon sample was retained from organically rich deposits. Due to their waterlogged nature, these samples were gently screen through 1/16" mesh to recover plant remains. All proveniences were bagged and tagged separately and each proveniences received a field specimen number (FS#). Narrative notes, field record forms, and photographic documentation was maintained during all phases of fieldwork.

Description of Excavated Proveniences

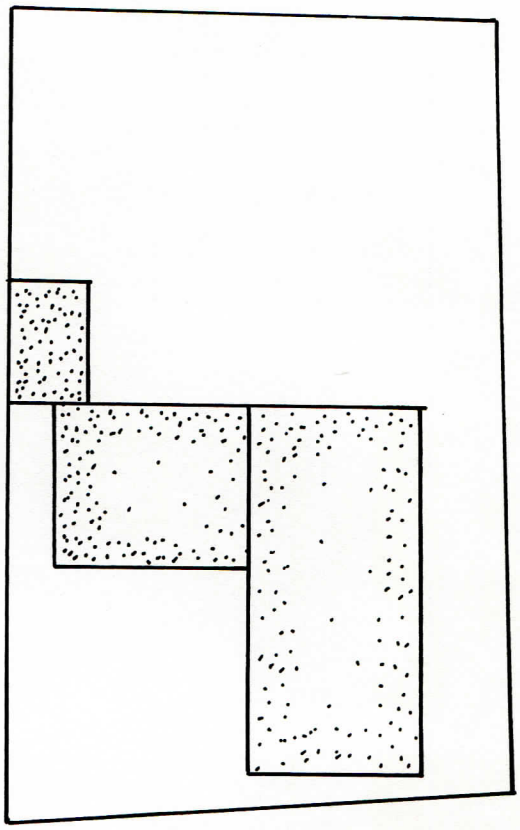
Two ten-foot squares were excavated at the Atlantic Wharf site (figure 15). Test Pit 1 was located just east of the brick wall, between the standing shed and the concrete block garage. The southwest corner of the square was 73.3' west of the western edge of Prioleau Street and 93.5' south of the southern edge of North Atlantic Wharf Street. The unit was located to intersect the east wall of a warehouse structure shown on the 1841 plat of Magwood's Wharf (figure 16).

The first zone of the square was removed with a backhoe. This zone consisted of the surface plus a modern deposit of demolition rubble, composed primarily of whole brick, clay roof tile, and burned slate in a matrix of dark soil and mortar. This zone was 1.7' thick, initiating at 8.86' msl. No materials were retained from this provenience.

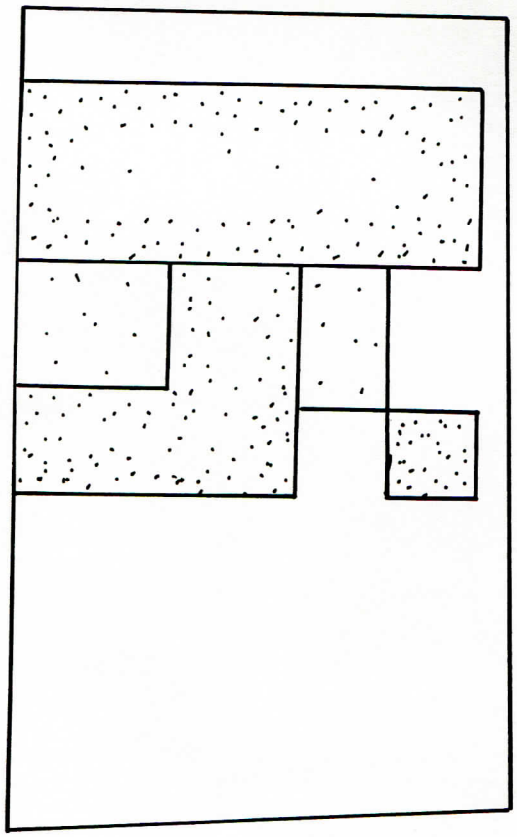
Hand excavation began with zone 2, initiating at 7.18' msl. Zone 2 was comprised entirely of wood charcoal, representing a burned structure. The deposit contained sparse artifacts, mostly architectural in nature. Zone 2 was excavated in two levels. Level 1 contained some mortar and was .8' thick. At the base of level 1 a brick foundation running north/south was encountered. This feature (feature 1) will be discussed in more detail at a later point. Zone 2 level 2 initiated at the top of feature 1 and contained less mortar. Zone 2 was uneven in depth, being deeper adjacent to feature 1 along the east side of the square. The base of zone 2 on this side was 4.9'



1739 Roberts and Toms map



1841 plat of Magwood's wharf



1788 Petrie map

Figure 16: Site map of Atlantic Wharf, showing locations of structures suggested on maps and plats

msl., while the base of this deposit along the west wall is 6.5' msl. Artifacts recovered from zone 2 indicate the structure burned in the late 19th century.

Feature 1 consisted of a brick foundation running north/south along the east wall of the square. The feature was 2.7' wide and consisted of three bricks laid end-to-end. Between the two easternmost rows of brick was a channel, possibly a track for a sliding door. The visible, western wall of the foundation was laid in English bond and continued to a depth of 3.13' msl. The base of the feature was not encountered during excavation. Based on the stratigraphic position of Feature 1 beneath zone 2, and adjacent to zones 3 and 4, the foundation could have been constructed in the late 18th or early 19th centuries, and is interpreted as the building shown on the 1841 plat. No builders trench was encountered.

Directly beneath zone 2 was designated zone 3, consisting solely of fallen brick and mortar. No artifacts were contained in this level. It appears that the deposit represents a demolished brick building, possibly deposited in the early 19th century. This deposit was uneven in depth and deepest along the west wall, suggesting that the building tumbled to the east. Zone 3 initiated at 6.7' msl. along the west wall and 5.1' msl. along the east wall at feature 1. The deposit had a level base at 4.55' msl. No artifacts were recovered from this deposit (figure 17).

Figure 17: South profile, Test Pit 1

Directly beneath zone 3 was a deposit of medium grey-brown sandy soil containing extensive cultural materials. This zone 4 initiated at 4.55' msl. The water table was encountered at 4.0' msl, and excavation continued with the aid of an electric pump. Due to problems with groundwater, excavation of zone 4 and test pit 1 was suspended at 3.13' msl. Zone 4 has a TPQ of 1795, provided by Annular Pearlware.

Test Pit 2 measured 10' by 10', and was located west of the standing brick wall. The southwest corner of the square was located 61.5' north of the north edge of Mid Atlantic Wharf Street and 92.8' west of the west edge of Prioleau Street. The top levels of asphalt and concrete were broken with a jack hammer and removed by hand. The underlying deposit was designated zone 1. The southwest corner of the asphalt surface initiated at 11.09' msl and zone 1 initiated at 10.67' msl.

Zones 1 through 8, as designated, represent a series of fill episodes, likely deposited to raise the elevation of the property. Fragments of porcelain electric insulator, as well as emerald green lamp shade glass and a 1916 penny recovered from zone 8 suggest that these zones were deposited from c. 1920 through the last few years. The zones averaged .4' in depth and were sand fill deposits in a range of colors, containing redeposited artifacts from the 18th through the 20th centuries. The base of zone 8 was encountered at 6.93' msl. Zones 1 through 8 are shown in figure 18.

Directly beneath zone 8 was an extensive deposit of brick and mortar rubble, representing the same deposit as zone 3 in Test Pit 1. Zone 9 initiated at 6.93' msl and continued to 4.54' msl. No artifacts were encountered in this zone. At the initiation of zone 9, the unit was truncated to 6' by 10'. A brick foundation was encountered along the west wall of the unit, running north/south (see figure 21).

Directly beneath zone 9 was a deposit of medium grey-brown sandy soil, similar in color, texture, and content to zone 4 in Test Pit 1. The date of the deposit, early 19th century, was slightly later than the sample in Test Pit 1. Zone 10 was excavated in five arbitrary levels. Level 1 initiated at 4.54' msl. and was closed at 4.23' msl. At the top of level 2 a brick wall was encountered, running east to west. The presence of this wall, designated feature 4, further reduced the excavated area to 4' by 6', north of feature 4. At the base of level 3 a third brick feature was encountered along the north wall of the square, further reducing the excavated area (figure 19). At the base of level 5, at 2.2' msl, a solid flooring or layer of wood planks was encountered. This flooring was two feet below the water table, and was never exposed due to the inefficiency of the small pump system. Further, the solid nature of the planks prohibited further excavations (figure 20).

The three foundations were difficult to date, due to a lack of builder's trenches, and the massive scale of the demolition and fill activities evidenced at the site. Feature 3 was oriented in a north/south direction along the west wall. The wall showed extensive evidence of repair and patching, although the bond appeared to have been primarily English. The stratigraphic position of

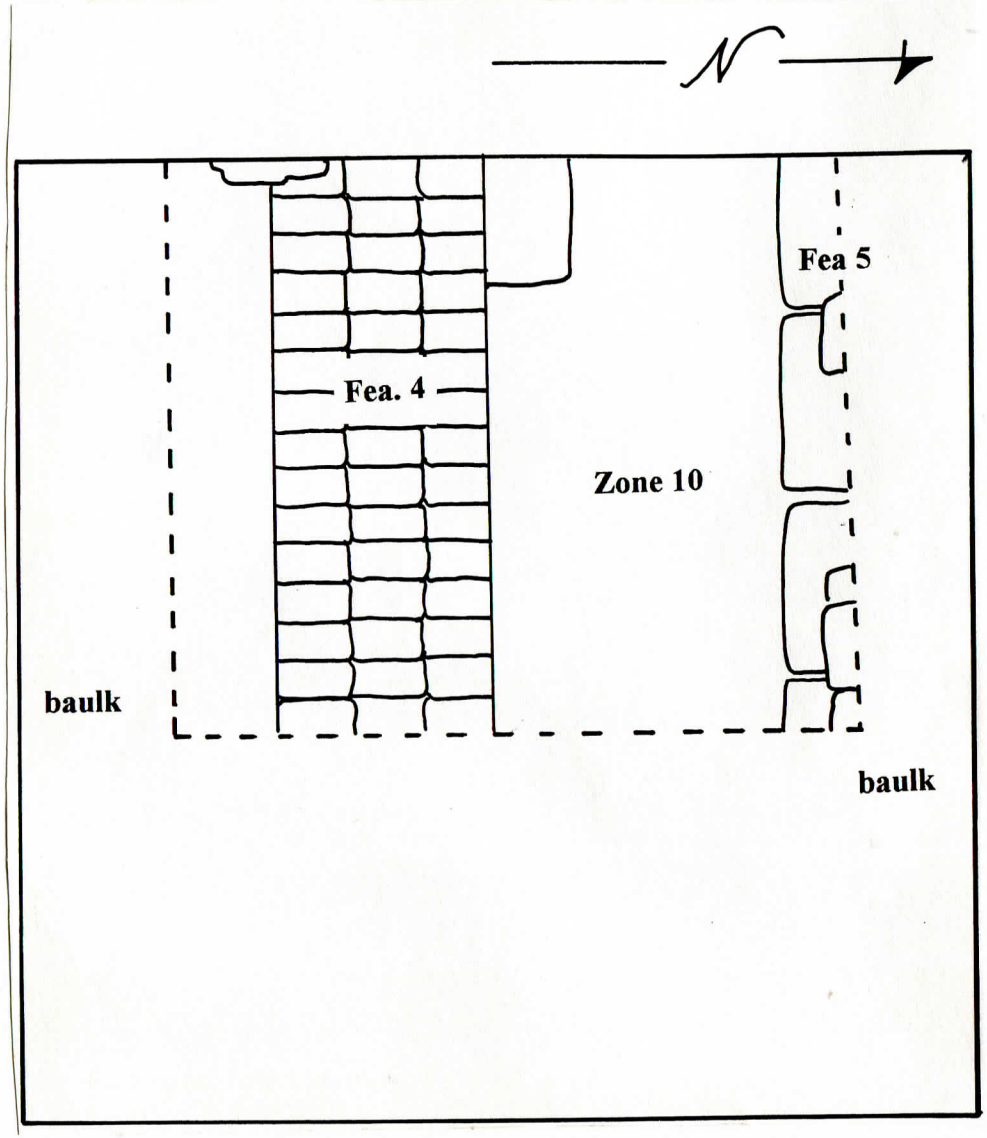


Figure 19: Planview, Test Pit 2, zones 9-10

Figure 18: North profile, Test Pit 2

feature 3 above feature 4 and zone 10 suggests that the foundation was constructed some time after the 1830s (figure 21).

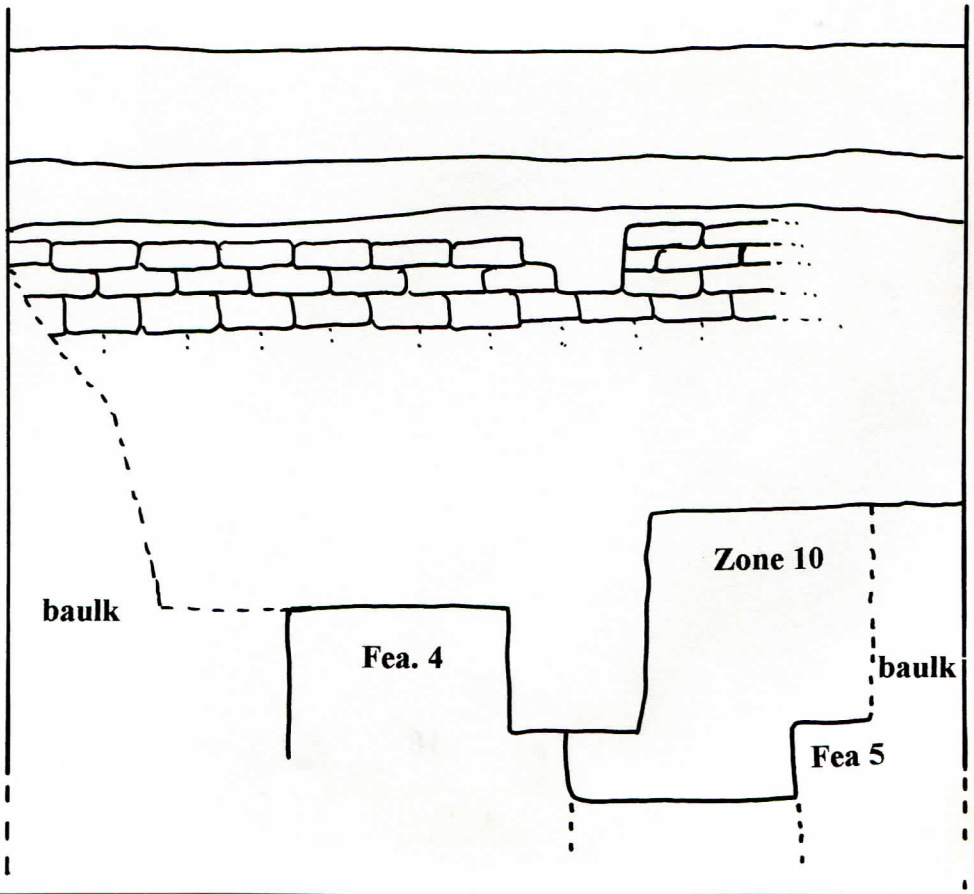
Feature 4 was a wall foundation running east/west, three stretcher bricks wide, placed end to end. The feature initiated at 4.2' msl, under zone 10 level 1, with a TPQ of 1795. Feature 4 was probably constructed some time around 1800. The feature was five courses deep in the western portion of the unit, and was laid on a foundation of oak planks (figures 20 and 21). In the eastern portion of the unit, the feature continued beneath the water table.

Only a small portion of feature 5 was visible in the excavation unit, and therefore interpretation of the feature is tenuous. The wall consisted of a course of brick overlying at least one course of granite block. The feature initiated at 3.13' msl and the first block continued to the limits of the excavations at 2.2' msl.

The stratigraphic position of the feature below the majority of zone 10 suggests that the wall was constructed prior to the deposition of the soil, and probably represents an 18th century structure. All three walls may represent the foundations of brick warehouses located on wharves from the 18th century through the present. The brick fall in test pits 1 and 2 and the charred wood remains in test pit 1 may reflect destruction of these buildings. Alternately, the network of foundations, or at least some of them, as well as the wood below, may represent cribbing for wharf construction. The c. 1800 date of the fill suggests that this was casual refuse accumulation during the era of Thomas Cochran's ownership, or deliberate fill and wharf construction conducted by Simon Magwood.

Figure 20: Close-up of zone 10, north profile, Test Pit 2

Figure 21: Photograph and drawing, Test Pit 2, west profile



Chapter IV
Analysis of Cultural Materials

Twenty-four discrete proveniences were defined from the two test pits excavated at the Atlantic Wharf site. The four defined zones in test pit 1 included two fill episodes from the 20th century, a layer of brick rubble containing artifacts from the mid-19th century, and the underlying Federal midden. Test Pit 2 contained similar stratigraphy, with additional layers of 20th century fill above the brick rubble (here defined as zone 9) and the Federal midden (here defined as zone 10). Only the midden zones yielded enough cultural material for meaningful analysis. The other proveniences are summarized in Table 1.

The midden deposits from the two units were initially analyzed separately. Comparison of the two assemblages suggest that they are the same deposit (see discussion before), and so are described as a single unit below. Taken together, the zone 10/zone 4 midden has a Terminus Post Quem of 1795 (transfer-print pearlware) and a Mean Ceramic Date of 1787.0.

Laboratory Methods

Following excavation, all materials were removed to The Charleston Museum where they were washed, sorted, and analyzed. All bagged materials were sorted by the field provenience number (FS#) and inventoried. Each artifact in each provenience was then washed in warm water with a soft brush and rebagged when dry. Analysis by provenience included identification and counting of each artifact by type. Washing and sorting commenced immediately after the field project and was conducted by trained laboratory technicians and volunteers.

Conservation procedures included reconstruction of ceramic and glass vessels, where possible, and stabilization of metal artifacts. Ceramic and glass artifacts were restored with DAP China and Glass Mender, reversible in acetone. Ferrous materials were separated during analysis and stabilized by soaking in distilled water. Selected ferrous and non-ferrous metal items were conserved via electrolysis some years after excavation. The ferrous artifacts were placed in electrolysis in a weak sodium carbonate solution with a current of six ampheres. Upon completion of electrolysis, ranging from a few weeks to a few months, they were placed in successive baths of distilled water to remove chlorides and dried in ethanol. Finally the artifacts were coated with a solution of tannic and phosphoric acid, and dipped in microcrystalline wax to protect the surfaces. Non-ferrous artifacts were also placed in electrolytic reduction, in a more concentrated solution with a current of six ampheres. Electrolytic reduction of these artifacts was usually accomplished in one to two days. They were then placed in distilled water baths to remove surface chlorides, dried in ethanol, and gently polished before being coated with Incralac to protect the surfaces.

Faunal materials were washed, separated from other materials, and weighed by

provenience. They were then shipped to the Zooarchaeology Laboratory, University of Georgia for analysis. The report by Dr. Elizabeth Reitz appears as the next chapter in this volume. Soil samples and flotation samples, ranging from one to five quarts in size were retained for ethnobotanical, pollen, and soil analysis.

The City of Charleston decided that permanent curation of the collection at The Charleston Museum was appropriate, and deeded the collection to the Museum. The Atlantic Wharf materials received accession number 1983.195. All excavated materials are curated in The Charleston Museum's storage facility according to museum collection policy. Artifacts are packed by provenience in standard low-acid boxes, labeled, and stored in a climate-controlled environment. Those artifacts worthy of individual study or exhibition, including all illustrated in this report, are stored in easily-accessible drawers in fireproof metal storage cabinets in the same facility. Field records and photographs are curated in the Museum's archive in acid-free containers in the security section. Archivally stable copies are available in the general research section of the archive and in the Archaeology department.

Analysis

The first step in the analysis of materials was the identification of the artifacts. The Museum's type collection, Noel Hume (1969), Stone (1974), Ferguson (1992), and Deagan (1987) were the primary sources used. Other references included Towner (1978), Lorrain (1968), Huggins (1971), Kechum (1975), and Switzer (1974).

For basic descriptive purposes, the artifacts from each of the temporal and horizontal assemblages were sorted into functional categories, based on South's (1977) model for the Carolina Artifact Pattern. South's methodology has been widely adopted by historical archaeologists, allowing for direct intersite comparison; all of the Charleston data have been organized in this manner. For nearly twenty years, archaeologists have attempted to classify the artifacts they recover by function, or how they were used in the everyday life of their owners. Artifacts are quantified in relative proportion to each other within eight broad categories. Broad regularities, or patterns, in these proportions prescribe the average retinue of activities on British colonial sites. While some have criticized this methodology as being too broad, it has been widely adopted by historical archaeologists working in the southeastern United States. In Charleston, it has been used as an initial organizing tool.

The midden assemblage is first described below, by artifact category. A functional and temporal analysis of the provenience, and comparison to other Charleston assemblage, follows.

The Federal-period Midden

The midden assemblage exhibited the contents and proportions of artifacts found in domestic middens throughout the city. Ceramics dominated the kitchen group and, as with most

Federal period assemblages, the relatively new and inexpensive refined earthenwares dominated the ceramics. The assemblage was distinctive in the presence of a small, but significant amount of Caribbean, Spanish, and French ceramics. These may relate to the Caribbean fishes recovered in the faunal assemblage, and discussed in the next chapter.

The earliest tableware is delft, present in small amounts. Delft is a tableware common in the early 18th century that persists in use through the late 18th century. Delft is more common on 17th century sites, but the wares were fragile. Tea cups and small vessels faded in popularity after 1750, but larger vessels, such as plates, platters, and punch bowls continued throughout the century (Austin 1994). British delft features a soft yellow-to-buff colored earthenware paste and an opaque, sometimes chalky-textured glaze consisting of tin oxide in a lead glaze. The glaze can be white, but often exhibits a light 'robin's egg' blue background color. Individual vessels may be undecorated, or feature hand-painted decoration in blue or a range of colors, the latter classified as polychrome. The Atlantic Wharf midden contained fragments of undecorated, blue-on-white, and polychrome wares.

Also recovered were a few fragments of the French tin-enamelled earthenware, known as Faience. These are similar to the British delft wares in style and quality. A small, but consistent amount of these wares are recovered on Charleston sites. The Navigation Acts of 1651 and 1660 required that foreign goods, including most ceramics, should be imported into England and her colonies only aboard English ships. Further proclamations and embargoes in 1672 and 1676, restricting the trade of any 'kind or sort of Painted Earthen Wares whatsoever (except those of China, and Stone bottles and juggs)" remained in effect until 1775, when trade was interrupted by the American Revolution. By that time British ceramic factories dominated the world market, and so few 18th century European ceramics arrived in the British colonies (Noel Hume 1969:140-141). The small, but consistent, amount of French faience present in the southern colonies has been attributed to alternate trading situations during the Revolutionary years. Some earlier wares, however, may be present in Charleston as the result of privateering, illicit trade, or via the French colonies of Louisiana or Canada. The Atlantic Wharf assemblage included two painted rim fragments and two fragments of brown-glazed wares from the Rouen potters.

The tin enamelled tablewares of the 18th century were briefly, but quickly, replaced by dinner and tea wares of white saltglazed stoneware. First developed in the 1740s, these became the typical English tableware of the mid-18th century. Plates and soup bowls, as well as a host of serving vessels and tea wares, are the most common forms recovered in Charleston, reflecting the rising importance of individual place settings and matched sets. While much of the saltglazed stoneware was undecorated, elaborately molded and sprigged examples are recovered as well. Typical plate forms included the 'dot, diaper, and basket", bead and reel, and barley patterns, though plain rims are also recovered. The Atlantic Wharf assemblage included a moderate amount of these wares.

A mid-18th century variation was decorated with incised lines that were filled with cobalt. The well-made examples date to the third quarter of the 18th century, but the more utilitarian

wares in the 'debased' version, in which the excess cobalt was left in the general area of the incising, was most popular from 1765-1775. The scratch blue stonewares are often found in such vessels as chamber pots, mugs, and pitchers. The Atlantic Wharf assemblage contained a few fragments of these wares.

Other stoneware teawares were part of the Atlantic Wharf assemblage as well. The midden contained a small amount of Nottingham stoneware. This is characterized by a hard grey stoneware body and a smooth or lustrous brown glaze over a white slip. The white slip distinguishes the Nottingham ware, and can be seen by viewing a ceramic fragment from the side. Noel Hume (1969:114) notes that several potters may have produced a variation of this ware. Also recovered on most Charleston sites is a coarse earthenware variety that features the Nottingham glaze and vessel forms. The assemblage also yielded fragments of the two unglazed stonewares. Elers ware is a fine red-bodied stonware, usually unglazed, featuring sprigged decoration of earlier vessels and engine turning on the later forms. Manufactured in the 1760s, the Elers wares were produced until 1775. The black bodied version, known as Black Basalte, remained in use later, until 1820, as it became popular as a mourning ware. The Atlantic Wharf assemblage contained a few fragments of Elers ware and a slightly larger amount of the Black basalte ware.

Three finely made redwares were produced by the Staffordshire potters and are recovered in small, but consistent amounts in Charleston: Jackfield ware, Agate ware, and Astbury ware. The earliest, Astbury, was not recovered at Atlantic Wharf. Agate ware, manufactured from 1740 to 1775, was recovered in small amounts. This consists of red and yellow clays swirled together and covered with a clear lead glaze. Five fragments were recovered at Atlantic Wharf. More common here, and more popular in Charleston in general, was Jackfield, produced from about 1740 to 1790. The ware was made by various potters and features a fine clay body that ranged from grey to purple to red, the red being the hallmark of the Staffordshire potters. The common feature was a deep black, oily or shiny black lead glaze. Jackfield vessels include tea wares and pitchers. Bowls and tea pots are the most common Charleston forms.

The most elaborate and popular tea and table ware of the 18th century were porcelains from China. Relatively rare and expensive in the late 17th to early 18th centuries, they were increasingly popular and available as the 18th century progressed. Robert Leath suggests that porcelain had become fairly commonplace in South Carolina by the 1730s, and a decade later was advertised regularly among merchants in the *South Carolina Gazette* (Leath 1999:50). Porcelains often comprise over 20% of the Federal-era ceramics at elite townhouse sites; they were 5% of the Atlantic Wharf ceramics. Chinese porcelain was made from a combination of kaolin clay and a finely ground feldspathic rock, and can be distinguished from other ceramic wares by a high-gloss glaze fused to the body. Those wares with an underglazed blue design are most common, followed by the more elaborate hand-painted designs over the glaze. Tea wares - handleless cups and saucers - are the most common forms recovered, but plates are also found in large numbers. The majority of the Atlantic Wharf porcelains were blue-on-white underglaze examples.

The most important ceramic development of the 18th century, and the one most strongly reflected in the Atlantic Wharf assemblage, was the gradual perfection of a thin, hard-fired cream-colored earthenware that could be dipped in a clear glaze. The ware fired at a lower temperature than stoneware, and was thus a refined earthenware. The resulting wares were durable, attractive, and inexpensive, and they rapidly spread throughout the world. Pioneering efforts in this direction were made by Thomas Astbury and Thomas Whieldon, but it was Josiah Wedgwood who ultimately perfected these wares and marketed them successfully. The original cream bodied ware featured clouded or swirled underglaze design in purple, brown, yellow, green and grey, introduced in the 1740s. In 1750, Wedgwood produced a wholly-green ware. All of these are loosely categorized as Whieldon Ware by American archaeologists. The Whieldon wares were manufactured until 1770, and are consistently present in 18th century contexts in small numbers. Only three fragments were recovered at Atlantic Wharf.

Far more numerous, in fact dominating the Atlantic Wharf assemblage, were creamwares. Creamwares, in fact, comprise 50% of the ceramics. They usually comprise about 20% of a domestic assemblage of this period, in keeping with the almost universal popularity of cream-colored earthenware in the late 18th century. (The relatively undisturbed late 18th century assemblage from 14 Legare Street, for example, contained 37% creamware). After Josiah Wedgwood went into business on his own in 1759, he found the green glazed ware was not so popular, and he turned his attention to refinement of the cream ware. Wedgwood appears to have perfected the ware by 1762, although diverse archaeological sites have produced evidence of earlier use (c. Deagan 1975). Regardless of the development date, by 1770 these wares could be found in the four corners of the colonial world, and are ubiquitous on archaeological sites of the period. The Atlantic Wharf assemblage contains a variety of forms, including chamber pots, plates, bowls, and smaller hollow ware forms.. Most distinctive among the Atlantic Wharf wares are several fragments decorated in an overglaze transfer print pattern in black. Such transfer-printed creamware often depict nautical scenes or commemorative decorations, and so are associated with maritime events.

The creamwares were augmented after 1780 with pearlwares. Throughout the 1770s, Wedgwood continued to experiment with production of a whiter ware, which in 1779 he termed 'pearl white'. Thus 1780 marks the beginning of the era in which British refined earthenwares feature a bluish tint to the glazing and blue pooling in the cracks and crevices. It was not Wedgwood's intention to replace the earlier creamware, but this did occur to a certain extent, as other potteries produced the new wares in quantity. In general, pearlwares are 17% of Charleston ceramic assemblages of the 1760-1820 period, compared to 25% creamware. The Atlantic Wharf assemblage contained 25% pearlwares.

Pearlwares come in a wide range of decorations, compared to creamware. Earliest (1780-1810) was hand painting in underglaze blue, most often in chinoiserie designs. The contemporary shell edged pearlware is perhaps the most readily recognizable historic ceramic. The ware comes most often in flatware - plates, soup bowls, platters - and feature rims molded in a feathery design which has hand-painted in blue or green. The earlier pieces, c. 1780-1795, feature careful,

individual brush strokes, accenting the individual mold marks. By the early 19th century, the hand painting had deteriorated to a single swiped band around the rim. The early 19th century also witnessed rims molded in designs other than feathers. The Atlantic Wharf assemblage features a large amount of shell edged wares, including some relatively rare hollow-ware forms.

Pearlware was also hand painted in a polychrome earth-tone pallet. These wares are most frequently tea wares - handleless cups and saucers. The colors of the 1780-1810 era are brown, sage green, cobalt blue, orange-rust, and yellow. The vessels feature small, delicate designs. While there is a wide range of patterns, the number is finite, and patterns are repeated across Charleston. Polychrome pearlwares are a common feature of the Atlantic Wharf assemblage.

Two other decorative styles were applied to pearlware in 1795, and they dominate the early 19th century ceramics. Transfer or bat printing involved the creation of detailed designs in myriad of patterns. The north Staffordshire potters, led by Josiah Spode, successfully produced this blue on white ware in 1784. This development, coupled with a significant reduction in the transportation of porcelains from Canton after 1793, resulted in a large market for the new ware (Copeland 1994:7; Miller 1991). Transfer printed wares were the most expensive of the decorated refined earthenwares and are usually recovered in a wide variety of forms, including tea, dinner, and serving pieces. The contemporary annular wares contrast with the transfer-printed vessels in that they were the least expensive, and come in a limited number of hollow ware forms. The multi-colored stripes, or bands of slip, are found on the exterior of bowls, mugs, and pitchers. Variants of this ware include wide bands decorated with a dendritic design, called mocha, and swirled blobs of color, called cabled. Transfer print wares outnumber annular wares in the Atlantic Wharf assemblage.

The British potters, including Wedgwood, continued to refine their glaze formulas so that by c. 1820 the blue tinge had been removed from the wares, leaving a white china. Much to the confusion of archaeologists, the same decorative motifs continue from pearlware to whiteware. The Atlantic Wharf assemblage, however, contained no whitewares, suggesting the midden was covered and depositions ended by 1810 or so.

The Federal period assemblage from Atlantic Wharf also yielded numerous fragments from utilitarian ceramics, though these together comprised only 8% of the ceramics. The earliest was North Devon gravel-tempered ware, which consists of a smooth red and grey clay body with quartz inclusions. The interior of the vessel is coated with a thick apple-green lead glaze. The Charleston examples are usually cream pans or one-gallon pots. The North Devon wares were manufactured from 1650 until the third quarter of the 18th century. The other early utilitarian ware, Buckley, was manufactured from 1720 until the Revolution. Buckley ware features the agate-like body of red and yellow clays, but the heavy vessels are ribbed on the interior and/or exterior and covered with a thick black glaze. Charleston forms include cream pans and bowls, glazed only on the interior, and large storage jars glazed on both sides (Noel Hume 1969:135).

The most common utilitarian ceramic on 18th century sites in Charleston are the body of

wares known collectively as combed and trailed slipwares. Noel Hume attributes most of these wares to factories in Staffordshire and Bristol, but British archaeologist David Barker (personal communication 1988) suggested Buckley or Liverpool as a source for much of the slipware imported to Charleston. The majority of these wares feature a buff- to yellow body and are decorated with combed lines of iron oxide or manganese under a clear to pale yellow glaze. The simplest were trails of brown glaze over the buff body, sometimes combed into elaborate designs. Other variations occur with light trailed stripes over a brown slip, or a 'skillfully marbelized blend of white, dark, and light-brown slips". Noel Hume declines to date these variants with accuracy, but suggests that the importation of these wares ended with the Revolution.

Slipwares are recovered in large numbers on Charleston sites. They average 10% of the ceramics for this period in Charleston, and have been as much as 25% of some domestic assemblages. They comprise only 5% of the Atlantic Wharf assemblage. Most distinctive among those recovered here were a significant portion that were a lighter color than commonly seen in Charleston. Most of the recovered fragments were from hollow ware forms, such as the small cups. It appears that both the body and the glaze were lighter than normal. These were grouped separately during analysis. Such fragments have since been recognized in small, but consistent numbers on Charleston domestic sites. It is possible that these ceramics are from a particular pottery, either in Britain or possibly in the American colonies. A possible source for these wares was the Cainhoy pottery of John Bartlam, operated from 1765-1770. Similar 'pale' slipwares were recovered there by Stanley South and Carl Steen (South 1993).

In late 18th century contexts, we also recover red-bodied slipwares decorated with trailings of white clay. Sometimes these vessels feature splotches of green or brown glaze. All of these are attributed to potteries in the North American colonies, possibly Philadelphia or Salem, North Carolina. Carl Steen has recently suggested that the many Philadelphia potters were the source of these wares, and the *South Carolina Gazette* regularly advertises ships arriving from that port. The most common Charleston examples are called Trailed Philadelphia Earthenware by Steen (1999), and match the description above. Cream pans and heavy, small bowls are the most common vessel forms recovered in Charleston. These are most common in the third quarter of the 18th century, and provide archaeological proof of inter-colonial trade, a venture rarely discussed in the documentary record (Steen 1999:68); these wares are about 1% of the Atlantic Wharf ceramics.

The other class of 18th century utilitarian ceramics are the stonewares manufactured in the Rhineland. Noel Hume suggests that these wares were imported into England and later onto the colonies in large numbers throughout the 17th and first half of the 18th centuries. After 1760, Rhineland's virtual monopoly was broken by the saltglaze potters of Staffordshire (Noel Hume 1969:276). The type known to archaeologists as Westerwald is grey-bodied and decorated in blue, and sometimes purple. Vessel forms of the later period include chamber pots, small crocks, and mugs of various sizes; earlier 18th century sites contain jugs with bulbous bodies and reed necks, and porringers. A small number of westerwald sherds were recovered from the waterfront. The Rhineland potters also produced saltglazed stoneware in brown. Most common are

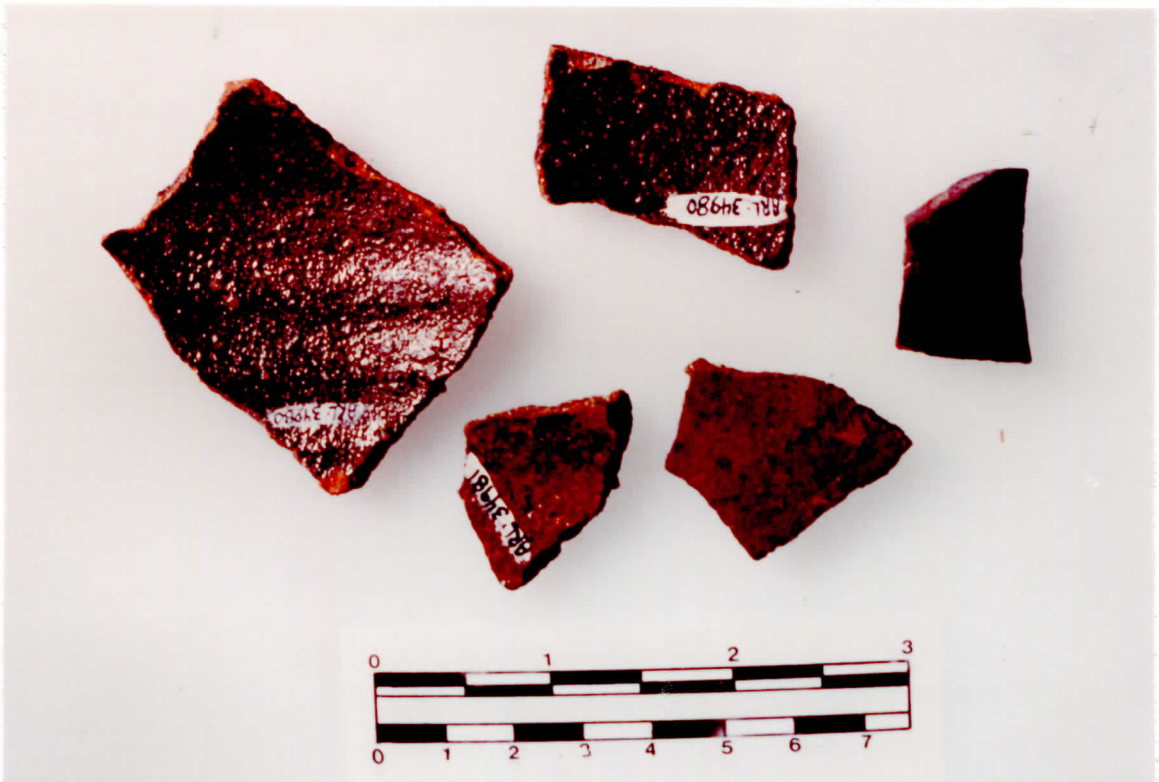
undecorated bottles or jugs. Only two fragments came from Atlantic Wharf.

The final class of ceramics, presumably used in the kitchen, were colono wares. Colono wares are locally made, unglazed earthenwares. They are recovered on all lowcountry sites from the early 18th century to the early 19th century. In Charleston they average 6% of the ceramics, though some lowcountry plantation sites contain as much as 50% colonowares. The most common forms are the globular jar and shallow bowl, though some vessels copy European forms (Anthony 2001; Crane 1993; Ferguson 1992). Colono wares are relatively sparse at Atlantic Wharf, comprising only 1.5% of the ceramics.

Atlantic Wharf also featured a number of lead glazed or unglazed coarse earthenwares, in a variety of forms and glazes. None are distinguished by name, but several attributed to British potteries were noted. But the most unusual aspect of the Atlantic Wharf assemblage was the presence of a number of Spanish or Caribbean wares. Most numerous, and most unusual, were the many fragments of El Morro ware, the majority of which were reconstructed. This vessel is a shallow, rimmed bowl, apparently without a foot ring (figures 21 and 22). The signature pronounced rim form is identical to that shown by Deagan (1987:50). As described by Deagan, El Morro ware is a lead-glazed coarse earthenware, distinguished by its granular, minimally smoothed surface. The paste is tempered with quartz sand, which is visible within the paste and felt through the thin lead glaze. The interior lead glaze is most commonly orange or olive green. The Atlantic Wharf vessel fits this description. A few fragments of this ware have been recovered from other Charleston sites, as well. Deagan, following Smith (1962) suggests a date of 1600 to 1770 for the ware. Though Hale Smith originally suggested a Caribbean source for the ceramic, Deagan suggests that the ware may be Spanish. More recently, Gregory Waselkov has suggested Mexico as the source for a significant amount of El Morro at the French colonial site of Old Mobile. Here, El Morro was found in association with majolica types manufactured in Mexico (Waselkov 1999:50).

Also recovered at Atlantic Wharf (and occasionally throughout the city) is an unglazed ware known as Greyware. These ceramics exhibit a compact and fine-textured dark grey past, well smoothed on exterior surfaces and exhibiting throw marks on the interior (figure 23). All datable examples are from post-1750 contexts, and they have been recovered in Second Spanish Period contexts in St. Augustine (Zierden 1981). The vessels reported by Deagan (1987:40) and from Charleston are hidroceramos, or water jugs, which feature a loop handle on top of the vessel and pouring spouts to either side of the handle. The most intact examples from Charleston have come from the waterfront (at the Exchange building) and in filled creeks, particularly Water Street.

A few other ceramics from Atlantic Wharf were more difficult to define. These were fragmentary and unglazed; the quality of their paste, however, suggests a non-English origin, possibly Spain or the Caribbean. Until further definition is possible, these have been classified as "caribbean earthenwares". Deagan (1987:36) loosely defines these as "Spanish storage jar", a term that has generally been used to classify 'mineral-tempered, unglazed coarse-earthenware sherds that fall within the range of attributes associated with Olive Jar, but have elements of form



Figures 22 and 23: fragments of El Morro ware, reconstructed El Morro vessel

Figure 24: examples of Greyware

Figure 25: miscellaneous unglazed earthenwares, probably Caribbean or Spanish

that eliminate them from that category". The Charleston assemblages have yielded vessels, both unglazed and featuring a light green tin enamel, that fall within that description.

The Atlantic Wharf site yielded a few fragments of Spanish Olive Jar, defined as the large amphora-shaped vessels with constricted necks. They are ubiquitous on Spanish colonial sites, and are often recovered in small numbers on English sites, as well. Charleston sites consistently yield a few fragments of these wares (figure 25). Finally, the Atlantic Wharf assemblage yielded a few small fragments of majolica, the Spanish version of tin-enamelled earthenwares. Majolica was produced in Italy and Spain, and later in Mexico (Deagan 1987; Waselkov 1999). A small, but consistent number of 17th and 18th century majolicas have been recovered in Charleston, many of them from the Mexican factories. The small fragments from Atlantic Wharf are difficult to type, but appear to be 18th century varieties, based on vessel thickness and glaze quality. Visitors, newly-arrived settlers, illegal trade and privateering are a few of the many ways that Spanish and Spanish Caribbean ceramics arrived in Charleston.

Olive green bottle glass comprised the majority of the other kitchen wares; nearly 2000 fragments were recovered. Other condiment and medicine bottles included those in clear or aqua glass. These were far less common at Atlantic Wharf. More common were fragments of small clear or aqua vials for holding medicines. In the late 18th century these were small cylinders, hand-blown with the distinctive pontil scar on the base of the bottle. Surprisingly common at Atlantic Wharf were fragments of table or serving glass. The most distinctive was a complete serving dish, consisting of an oval body with a short stem and heavy foot, in a style attributable to c. 1800. Drinking glasses, both tumblers and stemmed goblets, were recovered in large numbers. The neck of a decanter was also present. Handles from two knives were also recovered.

Architectural items were relatively sparse at Atlantic Wharf, compared to the Carolina pattern and to general Charleston patterns. This suggests that relatively little building material was discarded here. The midden, then, seems to be primarily the domestic debris of daily life, from neighboring houses. The architectural items present included the ubiquitous aqua window glass of the late 18th century. Interestingly, very little was recovered from Test Pit 1, while a far larger amount was recovered from Test Pit 2. This horizontal variation may suggest that the window glass, and perhaps the other architectural debris, came from building on the wharf and were incidental inclusions in the midden. Nails and nail fragments, in contrast, are fairly evenly distributed between the units. The other hardware and hinges were concentrated in Test Pit 1. The most distinctive architectural artifact were a few fragments of delft tiles, painted in blue on white backgrounds. Four brass nails, likely for slate roofs, were also recovered.

The proportions of the remaining categories of artifacts are consistent with the Carolina pattern and with other Charleston domestic sites, suggesting a 'domestic neighborhood' source for the refuse. All were present in small, but consistent patterns. Arms materials comprised .23% of the assemblage and consisted exclusively of flakes of English flint. These flakes may represent on-site gunflint manufacture, or they may be accidental inclusions. Four intact or partial gunflints were also recovered, and could be part of a transported domestic debris.

The eighty-seven clothing items comprised .94% of the assemblage. This group was dominated by one-hole bone button discs. These could represent on-site manufacture, as such items were often produced in a household setting. No button 'blanks' were recovered, however, and such a number of bone discs are possible in an average domestic debris assemblage. Shell buttons were also present; one unusual example was a large shell disc with a wire eye attachment on the back. A small number of brass buttons were recovered, as well. Several glass beads were also recovered. These included to tube beads, one blue and the other a cornaline d'alleppo, featuring the green glass body covered with opaque red glass. The others were wire-wound examples, and were much smaller, including two 'seed beads'. All were blue. Personal items comprised .13%, and included a slate pencil, a bone sewing bobbin, and a fragment of a figurine. Most numerous were fragments of bone slats from women's fans. A single furniture item was recovered; this was a brass keyhole surround.

Fragments of kaolin tobacco pipes were more common, and comprised 3.8% of the assemblage. The activities group comprised only .74% of the assemblage, and was somewhat limited in diversity. The group included a marble and a toy dish. The remainder were fragments of barrel straps. Again, these may have traveled here with domestic debris, or they could be evidence of on-site use. These issues are discussed in greater detail in the following section.

Table 1a
Provenience Guide

FS#	Provenience	Function	TPQ	Date of Deposition
2	T.P. 1, feature 2	fill in sill	mortar	20th century
3	TP1, zone 2 lev 2		ironstone	early 20th century
4	TP1, zone 2-3		creamware	early 20th century
6	TP1, zone 3	brick wall fall	hand-paint pw	mid 19th century
7	TP1, zone 4 lev 1	midden	annular ware	1800s
23	TP1, zone 4 lev 2		annular ware	1800s
24	TP1, zone 4 lev 3		annular ware	1800s
9	TP2, zone 2	fill	bathroom tile	20th century
10	TP2, area A	fill	rubber tire	20th century
11	TP2, zone 5	fill	beer bottle	20th century
12	TP2, zone 7	fill	1916 penny	20th century
13	TP2, area B	burned deposit	emerald glass	20th century
14	TP2, zone 78	fill	telephone insulator	20th century
15	TP2, zone 3	fill	coke bottle	20th century
16	TP2, zone 9	brick fall	4-hole button	mid-19th century
17	TP2, zone 10 lev 1	midden	transfer print pw	1800s
18	TP2, zone 10 lev 2		transfer print pw	1800s
19	TP2, zone 10 lev 3		transfer print pw	1800s
20	TP2, zone 10 lev 4		transfer print pw	1800s
21	TP2, zone 10 lev 5		transfer print pw	1800s

Table 2a
Quantification of the Assemblage

	Test Pit 1 Zone 4	Test Pit 2 Zone 10	Total
Porcelain, blue on white underglaze	15	65	80
Porcelain, overglazed	12	17	29
Porcelain, undecorated	10	21	31
misc. stonewares	27	67	94
Elers ware		1	1
Elers, glazed	1	1	2
Black basalte ware	3	6	9
White saltglazed stoneware	8	35	43
Scratch blue stoneware	2	4	6
Nottingham stoneware	1	4	5
brown saltglazed stoneware	1	1	2
Westerwald stoneware	2	11	13
grey saltglazed stoneware		1	1
Whieldon ware	2	1	3
Creamware	768	1124	1892
hand-painted creamware	5	1	6
transfer printed creamware	4	7	11
Pearlware, undecorated	112	171	283
blue hand painted	104	31	135
polychrome hand painted	81	49	130
annular	26	68	94
shell edged	42	102	144
transfer printed	15	76	91
North Devon gravel tempered ware		1	1
Buckley ware	8	6	14
lead-glazed earthenware	9	22	31
unglazed earthenware	8	43	51
black lead glazed earthenware		6	6
Agate ware	1	4	5
Jackfield ware	5	2	7
Slipware, combed and trailed	25	66	91
Slipware, 'pale'	44	38	82
Slipware, American	8	19	27
Delft, bisque	11	6	17
polychrome		15	15

blue on white	3	9	12
undecorated	4	28	32
Faience, misc	1	1	2
Faience, brown	2		2
Colono ware	13	40	53
El Morro ware	30		30
Olive Jar		2	2
Grey ware	3		3
Caribbean unglazed	1		1
Caribbean aboriginal		1	1
Olive green glass	910	1050	1960
clear container	24	83	107
pale green container glass	1		1
amber glass	4		4
blue glass	2		2
brown glass		1	1
pharmaceutical glass	30	26	56
glass tableware, misc	95	115	210
decanter		1	1
stemware	5	8	13
tumbler	19	17	36
serving piece		1	1
cutlery		1	1
window glass	111	1971	2082
nail fragment	191	379	570
delft tile	2	3	5
hardware	20		20
brass nail	2	2	4
flint flake	6	12	18
flint		4	4
furniture hardware		1	1
brass button	2	3	5
bead	6	3	9
bone, one hole	1	27	28
shell button	7	11	18
pin		27	27
figurine	1		1

slate pencil	1		1
bone sewing bobbin		1	1
fan slat		3	3
misc	2	4	6
pipe stem fragments	102	252	354
marble	1		1
toy dish	1		1
barrel strap	26	41	67

Chapter V
Vertebrate Fauna From Atlantic Wharf

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A number of archaeological sites have been excavated from urban Charleston (e.g., Zierden, Calhoun, and Paysinger 1983; Zierden, Calhoun, and Pinckney 1983; Zierden, Reitz, Trinkley, and Paysinger 1982). Much of this work focuses on elite properties in the town, but a few sites representing commercial, middle-class residential, and urban poor have also been excavated. In summarizing the information obtained from the vertebrate materials excavated from Charleston it appears that several features characterized diets in the town during the eighteenth and nineteenth centuries. These urban characteristics are sharply defined by contrasting them with what is known of rural subsistence at the same time (Table 1; Reitz 1986). In this comparison, urban sites from Charleston studied through 1988 are compared to rural sites from sea island or coastal plantations on St. Simons Island, Colonel's Island, and Camden County, Georgia.

Studies of animal remains from these urban and rural sites indicate that domestic sources of meat were commonly exploited, but were not the exclusive source of meat (Table 1). Urban diets included more domestic meat than did rural ones and diets in both situations contained more beef than pork. Caprines (sheep/goats) were much more common in urban diets than in rural ones. The only domestic birds found at urban sites are chickens and rock doves. Chickens are the most abundant fowl in both rural and urban collections, but chicken remains are far more common at urban sites than at rural ones.

Urban diets included fewer wild species than did rural ones (Table 1). Deer were the most common wild mammal in urban diets, though the remains of opossum, rabbit, squirrel, raccoon, and mink are also present in urban archaeological collections. Urban diets included more wild bird individuals, but fewer species, than did rural ones. The use of turkeys and Canada geese typlified the Charleston diet. Turkeys and Canada geese were far more commonly used by urban residents than by rural ones, but other wild birds in urban diets were limited to ducks, herons, and small perching birds (Passeriformes). Turtles and alligators were less frequently used by urban residents than by rural ones, though sea turtles are more common in urban collections than in rural ones. One area of substantial contrast between urban and rural sites is that fish are far more commonly identified in rural samples. The fish species identified in rural and urban collections are similar, but fishes generally constitute 18% of the individuals at urban sites, compared to 38% of the individuals in rural collections. Commensal species such as mice and rats are a common component in Charleston archaeological collections. These include not only vermin but also cats, dogs, and horses. Vermin, however, are usually more commonly identified at rural sites than at urban ones.

These characteristics describe in a general way Charleston collections as well as urban collections from Savannah (Honerkamp, Council, and Fairbanks 1983). Each site, however,

presents variations on this theme that may represent site history, social status, ethnicity, recovery methods, site formation processes, or a combination of these variables. Fishing is one aspect of urban animal use that may be particularly impacted by site formation processes and recovery technique. Although located adjacent to what appears to be a rich estuary, fishes comprise less than 18% of the individuals in most Charleston collections. However, some collections have high numbers of fish individuals, in a few cases over a third of the estimated vertebrate individuals are fish (Table 2). Such high levels of fish use are more typical of coastal and sea island plantations (Table 1).

One explanation for the low percentage of fish individuals in Charleston collections is recovery technique. Flotation has not been extensively used to recover materials from Charleston and this might result in the loss of fish remains, particularly of small fishes. However, when flotation was used at the Brewton site, it did not enhance the recovery of fish remains. No fish specimens were collected in the Brewton flotation samples and only four of the -Motte-Alston fish specimens were recovered by flotation. The high percentage of fishes in the Pringle-Frost drain is probably not due to recovery technique because only 67 of the 2,207 fish specimens in the drain were recovered in the floated fraction.

Site formation processes, particularly preservation environment, and deposits in which a third or more of the estimated individuals are fishes are strongly correlated. Before it was filled, the First Trident site was a low-lying damp area of the type that usually creates an anaerobic environment where preservation of fish specimens is enhanced. Preservation of organic artifacts such as leather goods was unusually good at First Trident and fish individuals comprise over a third of the estimated individuals in all three occupational contexts at the site. This suggests that behavior and time period alone are not explanations for the high numbers of fish specimens. Likewise, the highest concentration of fish at the 14 Legare Street site is in a collection from a late eighteenth-century well. While contemporaneous non-well deposits at 14 Legare have higher than average concentrations of fish, fishes are far more abundant in the well. A vaulted drain from the Pringle-Frost occupation of the Brewton site provided a moist, protected environment for good preservation. Thirty-five percent of the Pringle-Frost vertebrate specimens (NISP=2,587) and 72% of the Pringle-Frost fish specimens (NISP=2,207) are from this drain. Such evidence suggests that the low percentages of fish at some Charleston sites is a function of preservation. Such deposits lead to the conclusion that the urban diet included far more fish than the normal archaeological record indicates.

However, the collection with the highest concentration of fish remains (46% of the individuals) is the Brewton deposit at the Brewton site and thee fish do not appear to be related to depositional environment. There was a privy associated with the Brewton occupation. Although 10% of the vertebrate specimens (NISP=252) from the Brewton occupation are from this privy, only nine of the 562 Brewton fish specimens are from this context. Likewise, only 89 of 695 fish specimens are from the Motte-Alston privy at the Brewton site. The western edge of the Brewton site was bordered by a marshy area across which residential property at 14 Legare Street

was eventually developed and it is possible that these fish remains were primarily from random discard toward the western edge of the property.

On the other hand, fishes comprise between 21% and 29% of the individuals in many contexts that are not related to damp, protected environments (Table 2). Vertebrate remains from the Powder Magazine, McCrady's Tavern, the Russell House, the Motte-Alston occupation at the Brewton site, non-well materials from 14 Legare, Rutledge House, and 70 Nassau Street do not appear to be from damp locations. The pattern of fish use/deposition is highly variable in collections from these occupations but they suggest other explanations in addition to preservation.

Another explanation is that the use of fish is related to time period and social status as well as depositional environment. Most of the percentages of fish individuals above 30% are in contexts that originate in the eighteenth century, particularly the earliest part of the century. In only two of the collections dated exclusively to the nineteenth-century do fish comprise more than 30% of the individuals. It also appears that elite households in the late eighteenth-early nineteenth centuries, consumed higher percentages of fish than did other Charleston households (Table 1). Perhaps wealthy households demonstrated their wealth through a display of diversity not enjoyed by other people in the city enabled by access to outlying rural properties.

The materials from the Atlantic Wharf site provides an opportunity to observe subsistence behavior as preserved in another wet context, one not associated with high social status. The Atlantic Wharf site was formed by disposal of trash from businesses and residences north of Broad Street into the convenient Charleston Harbor. Over the years this disposal habit filled in the wharf area, forming land recently developed as a parking lot. The Atlantic Wharf trash dump was near a series of taverns such as McCrady's Tavern and the materials recovered from the former dump probably pertain to those taverns and other nearby commercial and lower-income residences. Atlantic Wharf is the type of setting where we would expect high numbers of fish remains if depositional environment alone was the primary factor governing recovery of fish remains. The depositional environment and the time period (1790-1820) would suggest that fish remains will be common; but the social status of the sites from which these materials originated suggest that fish remains would be similar to the General pattern for the city.

Materials and Methods

Excavations at Atlantic Wharf, Charleston, South Carolina, were conducted by Martha Zierden of the Charleston Museum, in 1983. Faunal materials were recovered from an area which had formerly been part of the Charleston harbor, on the water side of the wharf. A list of the Field Specimen numbers examined is presented in Appendix A. Faunal remains were recovered using 1/4-inch mesh screen. All of the materials date to the Federal Period (ca. 1790-1820), hence all of the proveniences were lumped into a single analytical unit.

Standard zooarchaeological methods were used during identification and analysis. The identifications were done by H. Catherine Brown using the comparative skeletal collection of the Zooarchaeology Laboratory at the University of Georgia. She was assisted by Bonnie M. O'Brian and Elizabeth J. Reitz. Specimens of all vertebrate taxa were weighed and counted in order to determine relative abundance of the species identified. Notes were made of modifications to the specimens and of elements represented. Measurements were recorded following Driesch (1976) for avian and mammalian elements. The greatest length of fish otoliths is recorded whenever possible. No fish atlas were identified. Minimum Numbers of Individuals (MNI) is estimated using paired elements, size, and age as criteria. In estimating MNI, all archaeological proveniences are combined.

Although MNI is the standard zooarchaeological quantification medium, the measure has several problems. MNI is an index which emphasizes small species over large ones. A faunal collection may have 10 catfish individuals and only one deer, based on MNI. It seems unlikely that the catfish contributed more meat than did the deer, however. Further, MNI is based upon the assumption that the entire animal was used at the site. This ignores a basic facit of human behavior: exchange or trade. This is a particularly important problem when dealing with historic samples where marketing of processed meat products was substantial, but the exact extent unknown. In addition to these problems, MNI is influenced by the manner in which the data from the archaeological proveniences are aggregated during analysis (Grayson 1973). Finally, some specimens, such as pig teeth, are simply more easily identified than others and the taxa represented by such specimens may appear more significant in the species list than they were in the daily diet.

In addition to MNI, specimen count, and specimen weight, an estimate of biomass provides information on the quantity of meat supplied by the identified taxa. In some cases the original live weight or size of the animal can also be estimated. The predictions are based upon the allometric principle that the proportions of body mass, skeletal mass, and skeletal dimensions change with increasing size. This scale effect results from a need to compensate for weakness in the basic structural materials, in this case, bone. The relationship between body weight and skeletal weight is described by the allometric equation:

$$Y = aX^b$$

(Simpson, Roe, and Lewontin 1960:397). Many biological phenomena show allometry in accordance with this relationship (Gould 1966, 1971). In this equation $\underline{X}$ is the skeletal weight or a linear dimension of the bone, $\underline{Y}$ is the quantity of meat or the total body size, $\underline{b}$ is the constant of allometry (the slope of the line), and $\underline{a}$ is the $\underline{Y}$-intercept for a log-log plot using the method of least squares regression and the best fit line (Reitz et al. 1987; Reitz and Wing 1999:222-229; Wing and Brown 1979:127-129). A given quantity of bone or a specific skeletal dimension represents a predictable amount of tissue due to the effects of allometric growth. Values for $\underline{a}$ and $\underline{b}$ are obtained from calculations based upon data at the Florida Museum of Natural History, University of Florida and the Georgia Museum of Natural History. The allometric formulae used in this study here are presented in Table 3.

In this study, allometry is used to estimate kilograms of meat represented by kilograms of bone where X is archaeological bone weight. This is a conservative estimate of biomass derived from the faunal materials actually recovered from the site. (The term "biomass" is used to refer to the results of this calculation.) Biomass reflects the probability that only certain portions of the animal were used at the site. This would be the case where preserved meats or redistributed meat was consumed.

The species identified from Atlantic Wharf are summarized into faunal categories based on vertebrate class and economic relationships. The categories are Domestic Mammals, Domestic Birds, Wild Mammals, Wild Birds, Aquatic Reptiles, Fishes, and Commensal Taxa. Domestic mammals include pig, cow, and caprines. The term "caprine" refers to both sheep and goats because these animals are frequently difficult to distinguish using osteological evidence. Domestic birds are chickens and rock doves. Wild terrestrial mammals include all such animals except the mice and rats. Wild birds include not only the ducks and thrush, but also Canada geese and turkeys. Turkeys and Canada geese species might have been domesticated or captive animals. According to the American Poultry Association (1874) standards of excellence for these two species were established by the mid-nineteenth century. However, morphological and other evidence of domestication has not been found in the Charleston archaeological record. Until such evidence is found, and because these birds are common in the Carolina low country, the conservative interpretation is that they are wild resources. In order to make comparisons of MNI and biomass estimates possible, the summary tables include biomass only for those taxa for which MNI is estimated.

Taxa tentatively classified as commensal are New World mouse (Peromyscus spp.), Hispid cotton rats (Sigmodon hispidus), Old World rats (Rattus spp.), Norway rats (Rattus norvegicus), roof rats (Rattus rattus), and cats (Felis domesticus). Many species of rodents are consumed by human populations, however, they are also associated with human residences and could easily be introduced into the archaeological record by accident. Given the type of deposit represented by Atlantic Wharf, these animals could have died where they lived, in a dump at the water's edge, providing evidence of the city's large vermin population. While commensal animals might be consumed, they are commonly found in close association with humans and their built environments either intentionally as pets and work animals, or unintentionally as vermin or as members of the urban wildlife. In an urban environment, other animals classified as consumed might actually have been commensal.

The presence or absence of elements in an archaeological assemblage provides data on animal use such as butchering practices and transportation costs. The rat and artiodactyl specimens recovered from Atlantic Wharf are summarized into categories by body parts. The Head category includes only skull fragments and teeth. The atlas and axis, other vertebrae, and ribs are summarized in the Axial category. It is likely that Head and Axial specimens are under-represented because of recovery and identification difficulties. In particular, vertebrae and ribs of pig-sized animals cannot be identified as deer, pig, or caprine unless distinctive morphological features support such identifications. Usually they do not, and specimens from these elements are

classified as UID Mammal because some non-artiodactyls also fall into the size-range of these medium-sized ungulates. Forequarter includes the scapula, humerus, radius, and ulna. Carpal and metacarpal specimens are presented in the Forefoot category. The Hindfoot category includes tarsal and metatarsal specimens. The Hindquarter category includes the innominate, sacrum, femur, patella, and tibia. Metapodiae and podiae which could not be assigned to one of the other categories, as well as sesamoids and phalanges, are assigned to the Foot category. The elements identified for artiodactyls are further summarized visually to illustrate their number and location in a carcass. Loose tooth fragments are not illustrated. Specimens identified only as sesamoids, metapodiae, podials, or phalanges are illustrated on the right hindfoot.

The archaeological cow elements represented are also compared to a standard unmodified cow skeleton using a ratio diagram (Simpson 1941; Reitz and Zierden 1991). Described by George Simpson (1941; Simpson et al. 1960:357-358), the formula is as follows:

$$d = \log_e X - \log_e Y$$

where $\underline{d}$ is the logged ratio, $\underline{Y}$ is percentage of each element category in the standard cow skeleton, and $\underline{X}$ is the same percentage of this category in the archaeological collection. It does not matter to what base the quantities are converted, though one should be consistent in order to remain comparable.

The standard cow skeleton is based on the number of elements present in an unmodified skeleton. In order to compare the archaeological data with the standard, the percentages of each element category for the standard are converted into logarithms, subtracted from the logged value of the same element category for the archaeological percentages, and plotted against the standard cow represented by the vertical line in the accompanying figure. Values on the positive side of the standard's vertical line are over-represented compared to the standard and values on the negative side of the vertical line are under-represented. A burial would present an essentially vertical line compared to the standard. Although the archaeological values are specimen counts and the values for the standard animals are whole elements, the relationships in the ratio diagrams are similar to those found in unmodified histograms.

Relative ages of the artiodactyls at death are estimated based on the degree of epiphyseal fusion for diagnostic elements and dental characteristics. When animals are young their elements are not fully formed. The area of growth along the shaft (diaphysis) and the end of the element (epiphysis) is not fused. When growth is complete the diaphysis and the epiphysis fuse. While environmental factors influence the actual age at which fusion is complete, elements fuse in a regular temporal sequence (Gilbert 1980; Purdue 1983; Schmid 1972; Silver 1963; Watson 1978). During analysis, specimens are recorded as either fused or unfused and placed into one of three categories based on the age in which fusion generally occurs. Unfused elements in the early-fusing category are interpreted as evidence for juveniles; unfused elements in the middle-fusing and late-fusing categories are usually interpreted as evidence for subadults, though sometimes size and degree of porosity indicate the specimen is from a juvenile. Fused specimens in the late-fusing group provide evidence for adults. Fused specimens in the early- and middle-fusing groups

are indeterminate. Clearly fusion is more informative for unfused elements which fuse early in the maturation sequence and for fused elements which complete fusion late in the maturation process than it is for other elements. A specimen from an early-fusing element that is fused could be from an animal which died immediately after fusion was complete or many years later. The ambiguity inherent in age grouping is somewhat reduced by recording each element under the oldest category possible. Tooth eruption data (Severinghaus 1949) are also recorded.

The sex of animals is an important indication of animal use; however, few indicators of sex are available in the archaeological record. Males are indicated by the presence of spurs on the tarsometatarsus of turkeys and antlers on deer. Male turtles are indicated by a depression on the plastron to accommodate the female during mating. Females are recognized by the absence of these features. Female birds may also be identified by the presence of medullary bone (Rick 1975). Another approach is to compare measurements of identified specimens for evidence of elements which fall into a male or female range, though there rarely are sufficient numbers of measurements to reliably indicate sex.

Modifications can indicate butchering methods as well as site formation processes. Modifications are classified as cut, burned, hacked, rodent-gnawed, carnviore-gnawed, and worked. While NISP for specimens identified as UID Vertebrate is not included in the species lists, modified UID Vertebrate specimens are included in the modification table.

Cuts and hacks are associated with butchery. Cuts are small incisions across the surface of specimens. These marks were probably made by knives as meat was removed before or after the meat was cooked. Cuts may also be left on specimens if attempts are made to disarticulate the carcass at joints. Some marks that appear to be made by human tools may actually be abrasions inflicted after the specimens were discarded, but distinguishing this source of small cuts requires access to higher powered magnification than is currently available (Shipman and Rose 1983). Hack marks are evidence that some larger instrument, such as a cleaver, was used. Presumably, a cleaver, hatchet, or ax was used to dismember the carcass before the meat was cooked. The presence of parallel striations on the outer layer of compact bone is evidence that a specimen was sawed, presumably before the meat was cooked. Some specimens present flat, even surfaces across the compact bone but do not have the striations. These are called "clean-cut" or "sliced."

Burned specimens may result from exposure to fire when a cut of meat is roasted. Burns may also occur if specimens are burned intentionally or unintentionally after discard. It is particularly likely that burning might be common at what was essentially a dump.

Gnawing by rodents and carnivores indicate that specimens were not immediately buried after disposal. While burial would not insure an absence of gnawing, exposure of specimens for any length of time might result in gnawing by scavengers. Rodents include mice, rats, and squirrels. Carnivores are dogs, cats, and raccoons. Gnawing by rodents and carnivores resulted in loss of an unknown quantity of the discarded material. Kent (1981) demonstrates that some

specimens gnawed by dogs may not necessarily show evidence of this gnawing and yet the specimens would quite probably be removed from their original context.

Worked specimens represent human activity that probably was not associated with diet. Worked specimens, such as grooved and snapped, flaked, or polished materials, include those which show evidence of human modification for reasons probably not associated with butchery. Worked specimens are described in more detail below.

Both MNI and biomass calculations are subject to sample size bias (Grayson 1979; Wing and Brown 1979). In samples of less than 200 individuals or 1,400 specimens, the sample may be too small for reliable interpretations. With small samples the species list is too short and the abundance of one species in relationship to others is probably somewhat inaccurate. It is not possible to determine the nature or extent of the bias, or correct for it, until the sample is made larger through additional work.

Results

The faunal assemblage from Atlantic Wharf is very small, containing 2,826 specimens weighing 9,221 gms and the remains of an estimated 65 individuals. The dominant group in terms of individuals are Commensal Taxa, particularly Old World rats (Rattus spp., R. norvegicus, and R. rattus; Tables 4 and 5). Both Norway and roof rats are represented in the collection. New World mice (Peromyscus spp.) and Hispid cotton rat (Sigmodon hispidus) are also present, as is a cat (Felis domesticus). The next most abundant group are Domestic Mammals. These contributed 20% of the individuals and 90% of the biomass. The most abundant of the domestic mammals is cow (Bos taurus), which contributed 11% of the individuals and 78% of the biomass (Table 5). By comparison, both pig (Sus scrofa) and caprines were minor components. Domestic Birds contribute 8% of the individuals but only 1% of the biomass. Chickens (Gallus gallus) are far more common than rock dove (Columba livia).

The most common group of wild animals other than rodents are Fish and Sharks. Fishes contribute 18% of the individuals, but less than 1% of the biomass. The most abundant are sea catfish (Arius felis, Bagre marinus) and sea bass (Centropristis spp.). Wild Mammals contribute 8% of the individuals and 5% of the biomass. This category includes rabbit (Sylvilagus spp.), muskrat (Ondatra zibithecus), and deer (Odocoileus virginianus). Wild Birds contribute 9% of the individuals but less than 1% of the biomass. This category includes ducks and geese (Anas spp., Aix sponsa, Branta canadensis), turkeys (Meleagris gallopavo), and a thrush (Muscicapidae). The remains of a diamond-back terrapin (Malaclemys terrapin), a common turtle in collections from Charleston, is further evidence that the nearby marsh was used.

One of the identified taxa deserves additional comment. Parrotfishes (Sparisoma spp.) are Caribbean animals that are not part of the marine fauna of the Carolina or Georgia coast (Dahlberg 1975). The specimen is an upper pharyngeal mill that is typical of members of this

family. It is extremely unlikely that a parrotfish could be caught near Charleston. This specimen must have entered the archaeological record after being transported to Charleston by someone coming from the Caribbean or another tropical setting. Because these are brightly colored animals it is possible that a sailor brought one of them back from a trip to more tropical waters. However, they also lose their distinctive coloration shortly after leaving the water, so that this coloration would be only faintly visible by the time the sailor landed in Charleston. It is more likely that the specimen itself was brought to Charleston as a curio.

Elements represented for some of the mammal taxa are tabulated in Table 6. Old World rats (including Rattus spp., R. norvegicus, and R. rattus) are the most skeletally complete. Pigs and cows are identified from both cranial and post-cranial remains, while deer and caprines are represented only by post-cranial materials (Figures 26-29). Deer are represented by specimens from both foreleg and the hindleg and caprines are represented primarily by specimens from the foreleg.

The log ratio diagram for cow (Figure 30a) presents a pattern in which the Head is present at a level similar to an undisturbed skeleton, Forequarter specimens are heavily underrepresented, Hindquarter specimens are overrepresented and Foot specimens are somewhat overrepresented. This pattern is very similar to that found at the other non-residential site studied from Charleston, the Charleston Beef Market.

The age data suggests that preference was given to the slaughter of young animals. The rabbit was probably an adult or subadult when it died while the rodents were both adults and juveniles. The muskrat was a subadult and the cat was an adult. At least one of the pigs was less than 18 months of age at death, while two others were subadults (Table 7). Only one adult pig was represented in the collection. One of the deer was less than 18 months old at death, one was a subadult, and one was an adult (Table 8). One of the cows was an adult at death, one was younger than 18 months old when slaughtered, and another five individuals were subadults at death (Table 9). One of the caprines was a subadult at death, while the other's age could not be determinated (Table 10). Five juvenile specimens are present in the UID Bird category, while one of the chickens was a juvenile when it died.

There were several indicators of sex for birds. Two of the specimens identified as UID Bird have medullary deposits (Rick 1975), though none of the chicken specimens have these deposits. Medullary deposits are reservoirs of calcium present in, on, and around the elements of females in egg-laying condition. Three of the chicken tarsometatarsii have spurs, suggesting the presence of two adult males. Two tarsometatarsii do not have spurs, suggesting one adult female chicken. The fourth chicken is a juvenile.

Burning is the most common modification observed in the Atlantic Wharf collection (Table 11). Burning is also ubiquitous; 18 of the 38 taxa in the collection are represented by at least one burned specimen. Given the prominance of Old World rats in the collection, the small number of burned rat specimens may be indicative of this taxon's relationship to the deposit. The

second most common modifications are cutting and hacking. Very few specimens are gnawed by rodents and even fewer are gnawed by carnivores. The two worked UID Vertebrate specimens are in FS# 17. One is a button and the other appears to be a preform out of which a button was punched.

Discussion

The Atlantic Wharf animal remains clearly reflect the type of deposit in which they were found and provide some insight into living conditions during the Federal Period in Charleston. The most stunning result of this study is that Old World rats (Rattus spp.) contributed 31% of the individuals in the Atlantic Wharf collection. This is a remarkably high percentage (Reitz 1994). Elsewhere in Charleston a similar percentage is found only in the natural trap formed by a well at the 70 Nassau Street site (Reitz 1990). The 70 Nassau Street well was a brick-lined feature at the home of a free African-American household. Although the well may have been dug in the 1840s, its contents appear to date to the early twentieth century. The well was enclosed by a house sometime after that, but it remained open, perhaps with water accessed via a pipe. Of the 48 individuals estimated in the well's contents, 69% were Old World rats (Rattus spp.). A similar quantity of rats was not found in other contexts 70 Nassau Street contexts (Ruff and Reitz 1992).

Other percentages of Old World rats are considerably lower than this. Among the highest percentages are those from the Pringle-Frost occupation at the Brewton site. Rats constitute 16% of the MNI in these 1840-1890 deposits (Zierden 2001a). Old World rats comprise 11% of the individuals in the 1820-1851 deposits at the Powder Magazine (Zierden 1997) and 15% in the low density nineteenth-century domestic occupation at what is now Charleston's Visitor's Reception and Transportation Center (Grimes and Zierden 1988; Zierden and Raynor 1988). At other Charleston sites, Old World rats and other commensal taxa, are a consistent but relatively low percentage of the individuals (Table 1; Reitz 1986).

The conditions that attract vermin were probably not uncommon in Charleston prior to municipal refuse collection programs. Because the numbers of rats found at Atlantic Wharf are unusually high for the city, however, these data suggest the possibility that some unusual activity took place here. The interpretation that presents itself is that most citizens made some effort to remove garbage from their immediate vicinity. The large quantity of animal remains recovered by archaeologists from all Charleston sites indicates that households did not do this very well; but apparently they did it well enough to reduce the number of vermin attracted to most properties, but not all. Where they tossed their garbage, however, was another matter. Following a time-honored tradition, one that continues into the present, trash was probably dumped into the nearest available body of water; in this case, Charleston's harbor. The wharf was probably the target of a casual form of trash disposal for nearby vendors, taverns, inns, and households. This trash disposal habit may have attracted vermin away from areas frequented by humans, but brought them to the water's edge in large numbers. The high numbers of rats at 70 Nassau Street,

however, clearly indicate that the vermin problem could reach uncontrolled numbers whereever undisturbed conditions with adequate food, shelter, and water presented themselves.

The data recorded for modifications to the specimens provides additional information about refuse disposal in Charleston. It might be expected that this informal dump would be burned from time to time, especially considering that it attracted so many rodents. This latter interpretation seems unlikely because of the low incidence of burned vermin remains. While 15% of the pig/deer/cow/caprine remains are burned, less than 1% of the rat specimens are burned. If the dump was burned from time to time, it seems probable that more of the rodent remains would show evidence of burning. It also seems likely that more of the specimens from other taxa would also be burned. It may be that the dump was not burned and that all of the burned specimens represent exposure to fire before they were discarded at the water's edge, suggesting that roasting, or a similar form of cooking, was employed by the households at which this trash originated. On the other hand, perhaps the rats were simply good at escaping the flames.

Of somewhat more significance in interpretation of human subsistence at Charleston, fish and sharks contributed 18% of the individuals in the Atlantic Wharf collection. This level of fish consumption is in keeping with levels of fish consumption found at other Charleston sites generally (Table 1; Reitz 1986). It also suggests that the high percentages of fish individuals found at the sites listed in Table 2 must be attributed to behavior beyond site formation processes and enhanced preservational environments. If the humid nature of deposits was the only factor responsible for enhanced preservation of fish, fish would also have been as well preserved and equally abundant at Atlantic Wharf as at the First Trident site, in the 14 Legare well, and in the Pringle-Frost drain. It appears that we must continue to explore a joint relationship between depositional environment and economic standing for each context.

If Atlantic Wharf was a dump to which nearby residents consigned their more obnoxous garbage, this could mean that the animal remains recovered from residential/commercial lots are biased by the removal of an unknown portion of the food refuse from each site. One way to explore this is to compare the cattle elements represented at Atlantic Wharf with those from other sites in Charleston. When such data are plotted against a standard cow, three patterns emerge which seem to reflect site function (non-residential versus residential) rather than status.

The non-residential pattern (Figure 30a; Reitz and Zierden 1991) can be divided into two categories based on site function: public facilities associated with the sale and disposal of meat (Beef Market and Atlantic Wharf) and entertainment facilities (McCrady's Tavern and Lodge Alley). Materials from all four of sites are from the mid-1700s-to mid-1800s except the Beef Market, which was closed by 1796. In the Beef Market pattern, fragments from the Head are more common than in the residential pattern (Figure 30b). Elements from the Forequarter are under-represented compared to residential sites. Hindquarter and Foot fragments are found in similar proportions in the market refuse and residential patterns. The Atlantic Wharf materials follow the Beef Market refuse pattern (Figure 30a). The Wharf is not too far from the Beef

Market and may have been a primary location for discarding refuse from the Market and other nearby locations generating similar waste.

The pattern for entertainment-related collections is the reverse of the refuse pattern yet distinct from the residential pattern (Figure 30a, 30b). At sites whose primary function was public entertainment fragments from the Head are more common than at residential sites. In fact, the refuse and entertainment patterns have identical ratios of Head fragments compared to the standard cow. Specimens from the Forequarter are over-represented in a mirror image to the pattern described by refuse sites though somewhat below that described for residential sites. Fragments from the Hindquarter are rare or absent, also in a mirror image to the refuse pattern. Fragments from the Foot are slightly more common in the entertainment pattern than in the residential one. The percentage of entertainment-related fragments from the Forequarter, however, falls within the residential range. Entertainment facilities may have obtained meat exclusively through purchase at the market, thereby removing bones from the Market.

Both non-residential patterns are distinct from the residential one found at elite and middle status sites (Figure 30b; Reitz and Zierden 1991). While specimens from both the Head and Foot are recovered from residential sites, fragments from the Hindquarter and especially the Forequarter, are more abundant than those from the Head or Foot. Forequarter specimens are more common than Hindquarter specimens regardless of status. All residential sites, regardless of whether they were associated with middle or elite status occupants, conform to this pattern.

The specimens from residential sites do not compliment those missing from the Beef Market and Atlantic Wharf. This suggests that the Market was not the only source of meat for most residential sites. Cattle specimens probably became part of the archaeological record at residential sites through a combination of on-site butchery, meat purchased from vendors, and salted meats. Because the residential pattern is also unlike the unmodified distribution of elements in a cow skeleton, on-site butchery was not the only source of meat/specimens at residential sites. Instead, a combination of on-site butchery and market purchases is indicated. Residential customers may have purchased cuts containing teeth or other skull fragments only occasionally. They were more likely to purchase cuts from the Forequarter and to discard those on their own property. At home, consumers discarded these market-derived bones along with ones from the head, hindquarter, and foot originating from their own, on-site slaughter activities.

The primary users of the Market were probably less affluent households and commercial venues such as McCrady's Tavern and Lodge Alley, consumers that may not have had the means, interest, or skill to maintain cattle on their own property and/or to slaughter them there. Market customers rarely purchased cuts containing teeth or other skull fragments, but they did purchase cuts from the forequarter. They discarded these market bones on their own property and not at the Wharf.

In some respects, the vertebrate remains from Atlantic Wharf are similar to those from other Charleston sites. The three major domestic taxa are cattle, pigs, and chickens. Caprines are

present in small numbers. Wild mammals and birds are present in the Atlantic Wharf collection in proportions similar to those found at other urban sites. Deer is the most abundant wild terrestrial animal. The variety of wild mammals and wild birds is limited. Just as in other urban collections, wild birds are primarily Canada geese and turkeys. Aquatic reptiles are not abundant in the collection nor are fish. The fish taxa identified are typical of the area except for the parrotfish. This specimen probably is a curio brought to the city by a traveler from more tropical latitudes.

Socio-economic status has been consistently examined from the perspective of the vertebrate record (e.g. Reitz 1987). Exploration of this aspect of human activity in Charleston is hampered by lack of firm evidence for the identity of the people actually in residence at a specific site. Given the history of the Atlantic Wharf dump, ascribing socio-economic status to the depositors of the materials is particularly problematic. However, the proximity of Atlantic Wharf to Lodge Alley and other sites associated with low socio-economic status and the pattern of cattle specimens represented at the dump suggest that the trash at Atlantic Wharf originated at establishments that were not part of the Charleston elite and perhaps only from the Beef Market or a similar location.

Conclusions

The materials from Atlantic Wharf are interesting for a number of reasons. From these data some information is available for trash disposal habits in Charleston. This activity appears to leave a distinctive pattern that can be identified by examining elements represented at each site. Biases due to trash removal undoubtedly became more important as trash disposal became more thorough in more recent times. The Atlantic Wharf materials also provide on opportunity to explore the importance of humid depositional conditions on the archaeological record. It appears that the high percentage of fish recovered at Charleston sites reflects human behavior at each site in addition to natural depositional conditions. The explanation of that behavior awaits further archaeological investigations. Atlantic Wharf also provides insight into the extent to which Charlestonians lived with vermin during the Federal Period. The Atlantic Wharf data also highlight the importance of working with animal remains from many different kinds of sites in order to better understand animal use in the city.

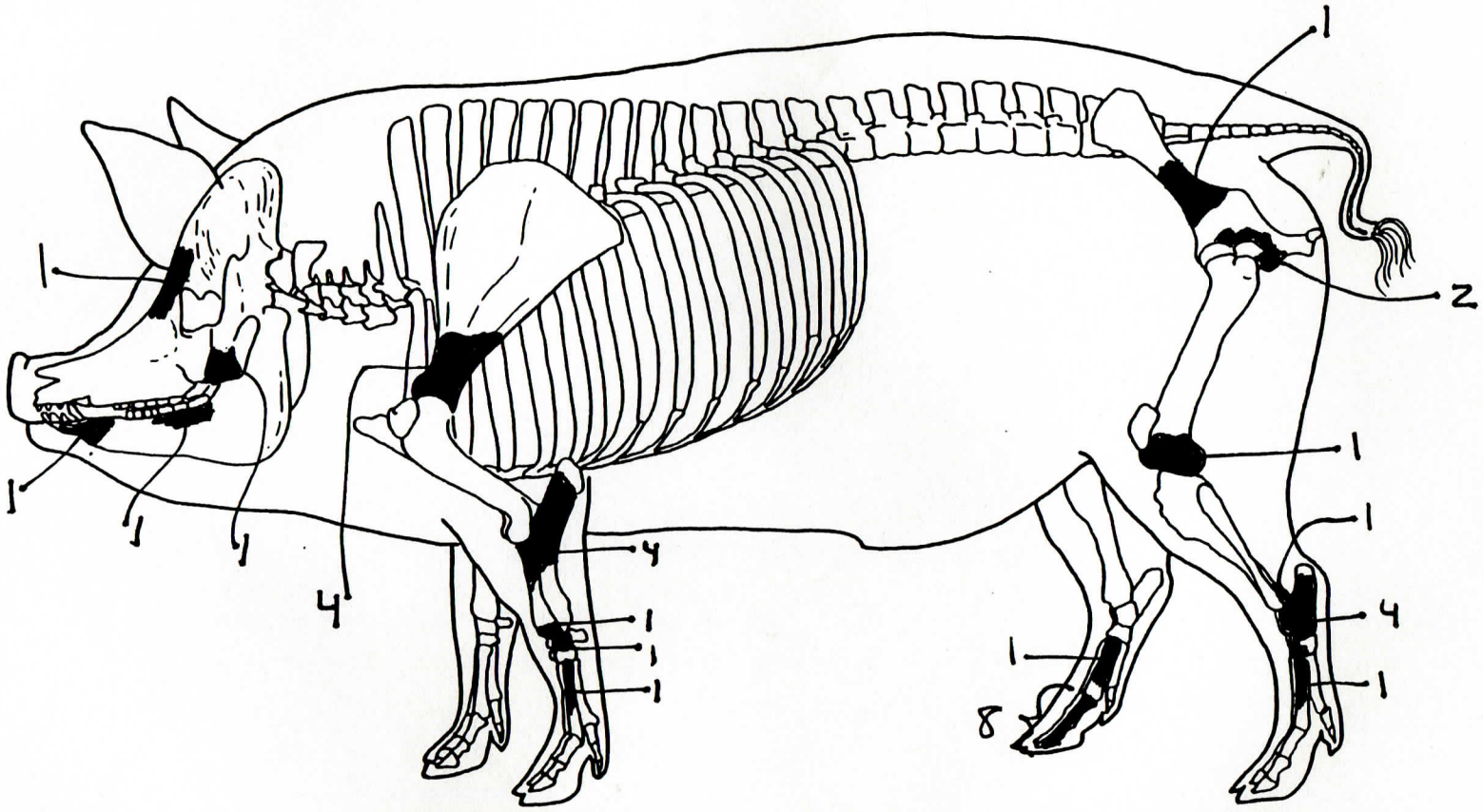


Figure 26. Atlantic Wharf: Pig Elements Identified. Not shown are 28 teeth. NISP=62

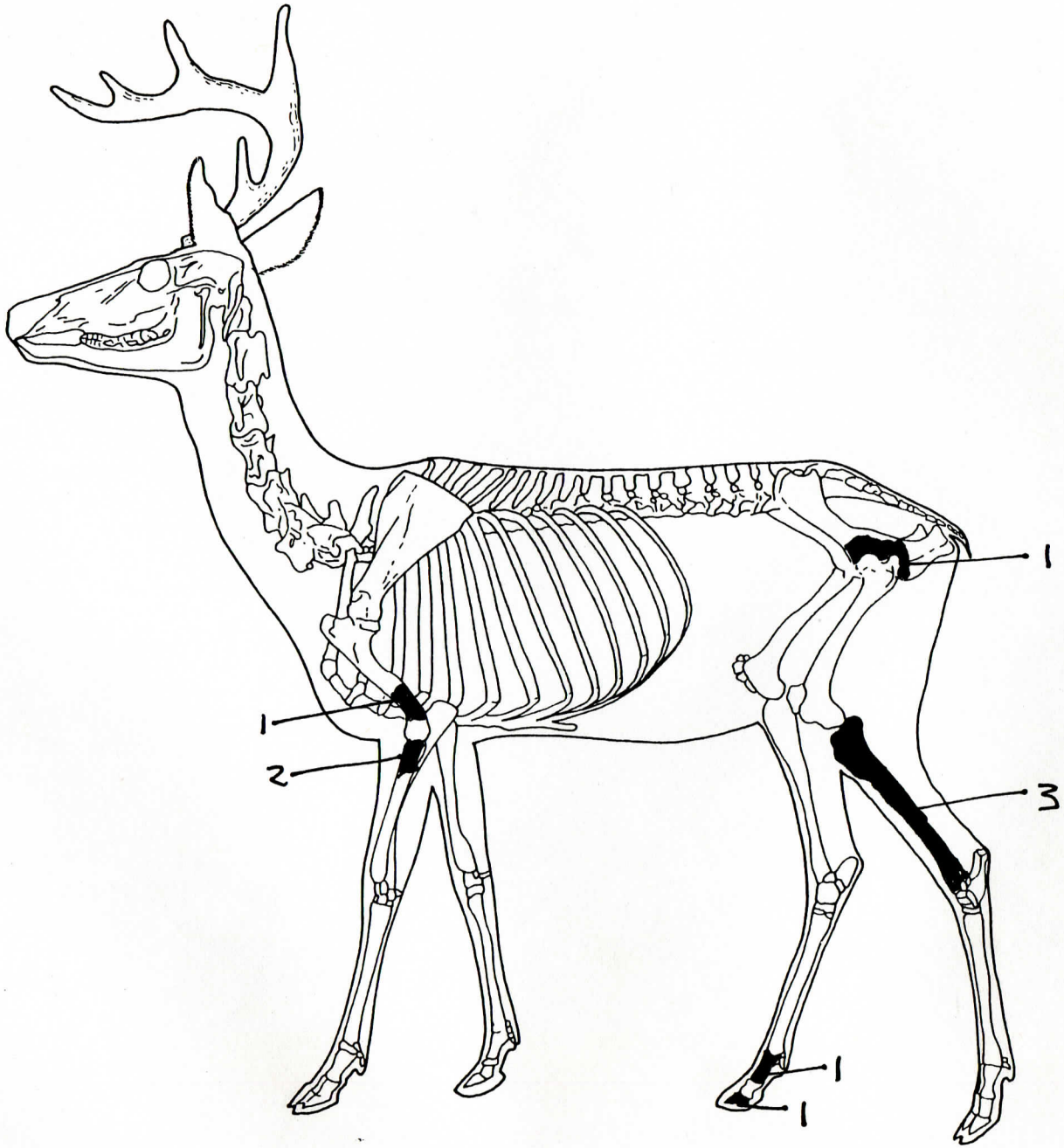


Figure 27: Atlantic Wharf: Deer Elements Identified. NISP=9

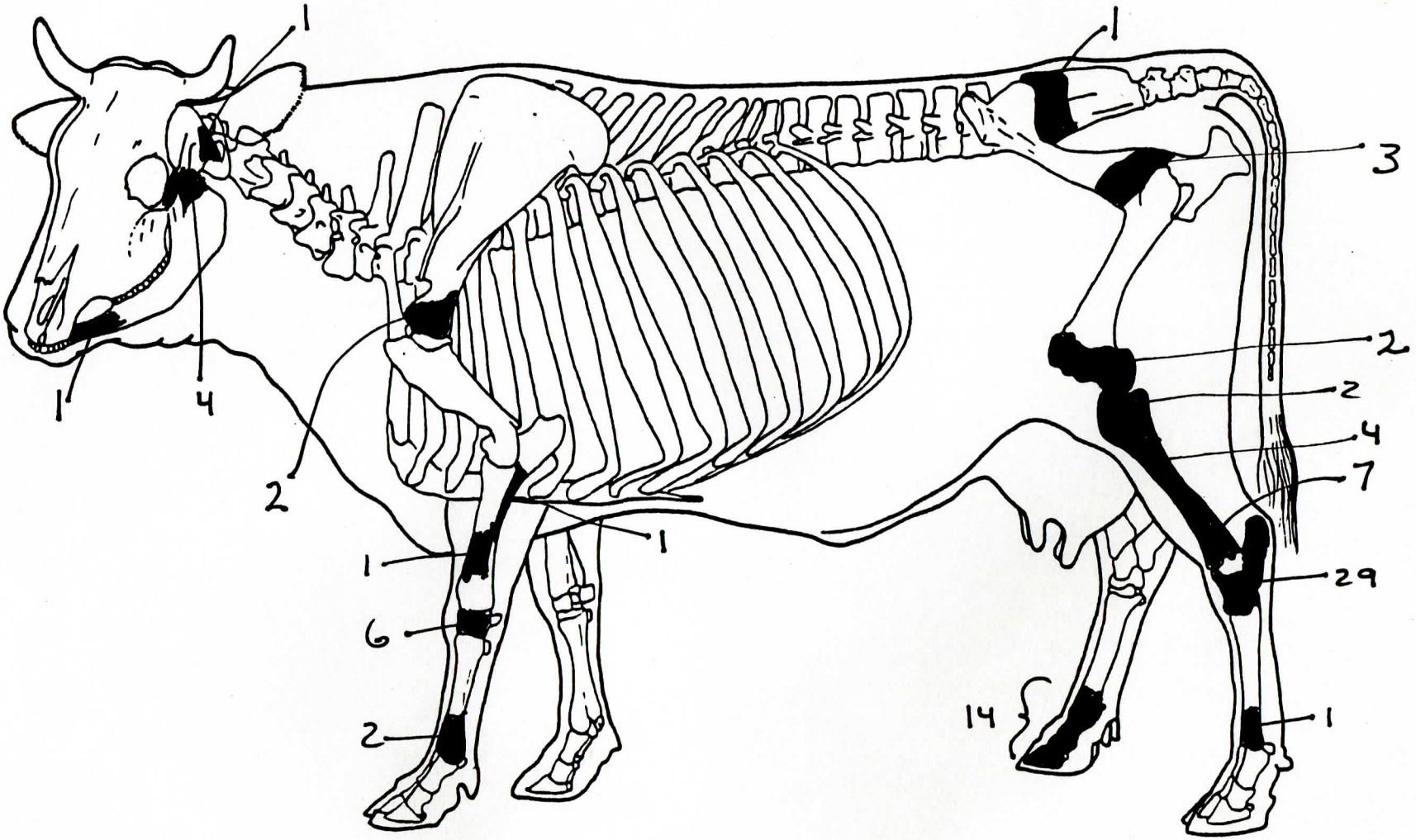


Figure 28: Atlantic Wharf: Cow Elements Identified. Not shown are 32 teeth. NISP=113

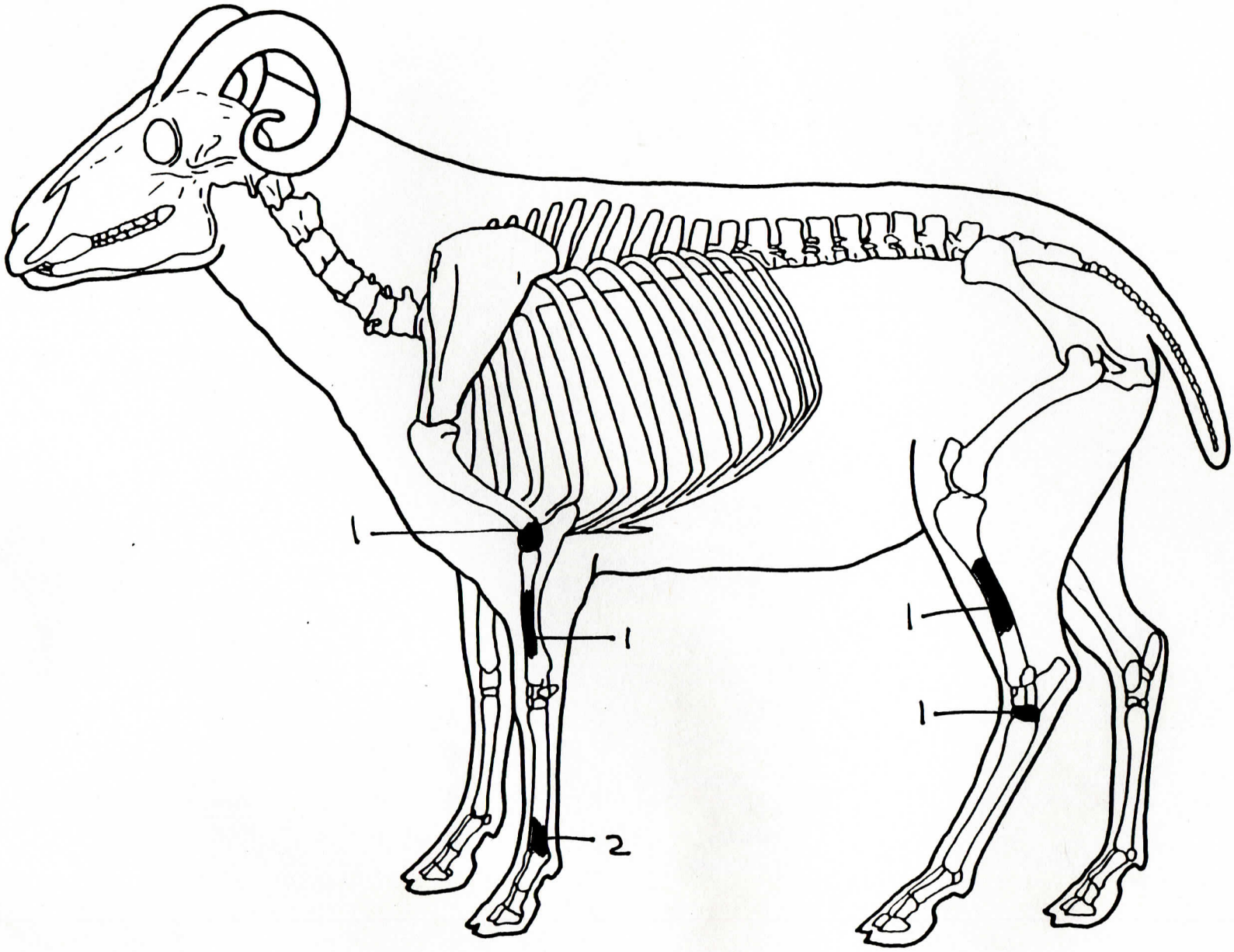
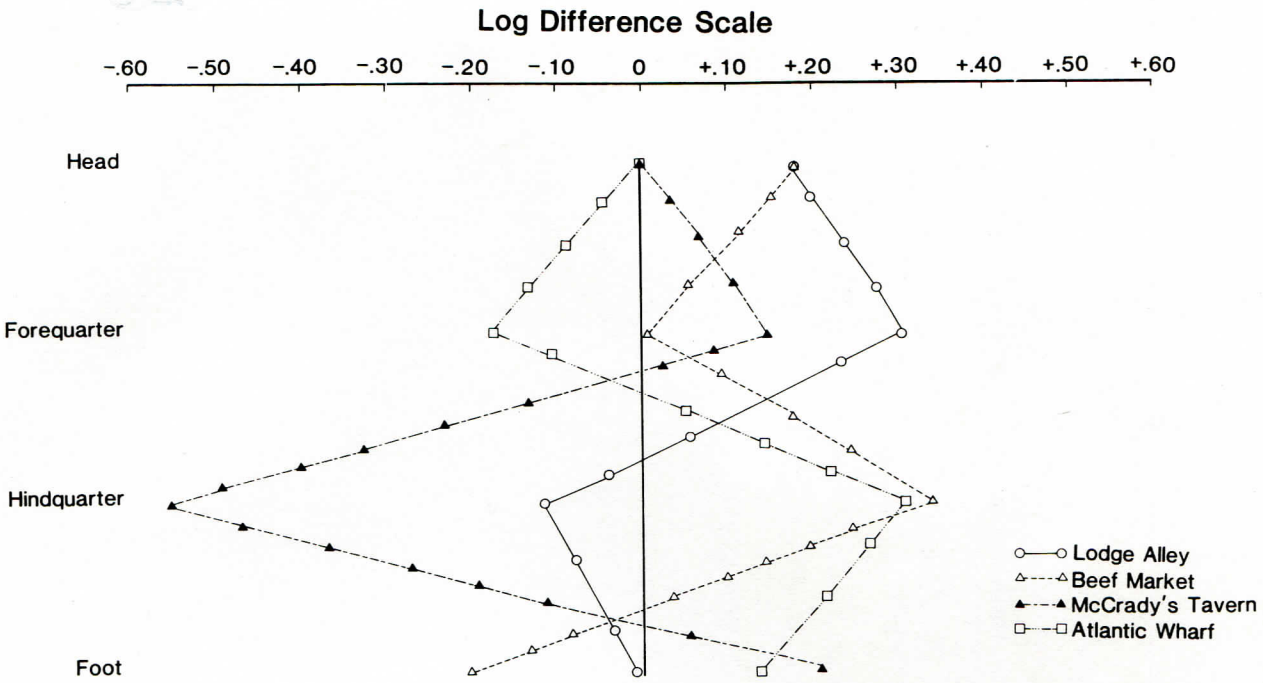


Figure 29: Atlantic Wharf: Caprine Elements Identified. NISP=6



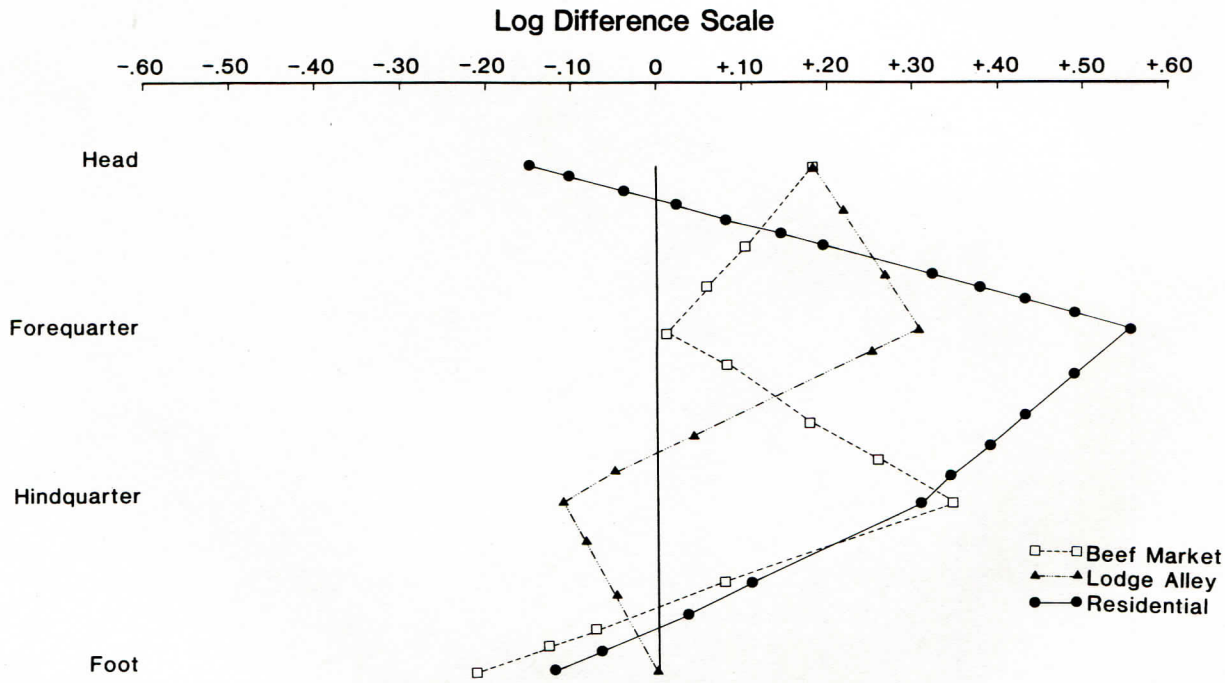


Figure 30: Log Ratio Diagram for Cows from Lodge Alley, Beef Market, McCrady's Tavern, and Atlantic Wharf (Reitz and Zierden 1991). Figure 30a compares waste disposal and entertainment patterns. Figure 30b compares waste disposal, entertainment, and residential patterns.

Table 1. Charleston Summaries.

	General		Rural		Upper Status		Beef Market	
	MNI	%	MNI	%	MNI	%	MNI	%
Domestic Mammals	250	31.4	172	17.2	71	30.7	33	42.3
Domestic Birds	118	14.8	41	4.1	27	11.7	7	9.0
Wild Mammals	67	8.4	192	19.2	20	8.7	12	15.4
Wild Birds	80	10.1	30	3.0	26	11.3	7	9.0
Aquatic Reptiles	39	4.9	137	13.7	13	5.6	2	2.6
Fish and Sharks	145	18.2	383	38.4	56	24.2	15	19.2
Commensal Taxa	97	12.2	43	4.3	18	7.8	2	2.6
TOTALS	796		998		231		78	

The general category includes data from the following sites: Aiken-Rhett; Atlantic Wharf; Charleston Place; all of First Trident, Gibbes, Lodge Alley, and McCrady's; Charleston Post Office; Rutledge; and 66 Society (Bastian 1987; Honerkamp, Council, and Will 1982; Reitz 1986; Zierden, Buckley, Calhoun, and Hacker 1987; Zierden, Calhoun, and Hacker 1986; Zierden, Calhoun, and Paysinger 1983; Zierden, Calhoun, and Pinckney 1983; Zierden and Grimes 1989; Zierden, Grimes, Hudgens, and Black 1988; Zierden and Hacker 1987; Zierden, Reitz, Trinkley, and Paysinger 1982). Rural data are from Reitz (1986) and Beef Market data are from Calhoun, Reitz, Trinkley, and Zierden (1984). Upper Status sites are Aiken-Rhett, the Federal Period sample from First Trident, Gibbes, and Rutledge.

Table 2. Charleston Contexts in Which Fishes Constitute More than 18% of the Individuals.

Function	Site	Date	% Fish Individuals
Military	Powder Magazine	1712-1750	27%
Commercial	First Trident, Tannery	1740s	33%
Residential	Brewton (Brewton House)	1750-1775	46%
Unknown	First Trident, Colonial	1740s-1840s	37%
Public	McCrady's Tavern	1778-1788	21%
Residential	pre-Russell (Russell House)	1730-1810	21%
Military	Powder Magazine	1751-1820	24%
Residential	Motte-Alston (Brewton House)	1775-1830	29%
Residential	14 Legare Street, non-well	1770-1800	27%
Residential	14 Legare Street, well	1770-1800	37%
Residential	Rutledge House	1770-1820s	21%
Residential	First Trident, Federal	1790-1840	33%
Residential	Russell family (Russell House)	1808-1857	21%
Unknown	Powder Magazine	1820-1851	22%
Residential	Rutledge House	1820-1850	33%
Residential	14 Legare, front & middle garden	1800-1880	21%
Residential	14 Legare Street, workyard	1800-1880	23%
Residential	Pringle-Frost (Brewton House)	1840-1890	39%
Residential	70 Nassau Street, non-well	1850-1900	23%

Data from Ruff and Reitz (1992); Zierden (1996, 1997, 2001a, 2001b); Zierden, Calhoun, and Pinckney (1983); Zierden and Grimes (1989); and Zierden, Reitz, Trinkley, and Paysinger (1982).

Table 3. Atlantic Wharf: Allometric Values Used in Study.

Taxa	N	Slope (b)	Y-Intercept	r^2
Bone Weight (kg) to body weight (kg)				
Mammal	97	0.90	1.12	0.94
Bird	307	0.91	1.04	0.97
Turtle	26	0.67	0.51	0.55
Chondrichthyes	17	0.86	1.68	0.85
Osteichthyes	393	0.81	0.90	0.80
Non-perciformes	119	0.79	0.85	0.88
Siluriformes	36	0.95	1.15	0.87
Perciformes	274	0.83	0.93	0.76
Serranidae	18	1.08	1.51	0.85
Sciaenidae	99	0.74	0.81	0.73
Pleuronectiformes	21	0.89	1.09	0.95

Table 4. Atlantic Wharf: Species List.

	NISP	MNI		Wt., gm	Biomass, kg
		#	%		
UID Mammal	1769			4833.10	54.43
Sylvilagus spp.	1	1	1.5	2.0	0.05
Rabbit					
UID Rodent	111			13.5	0.27
Peromyscus spp.	1	1	1.5	0.1	0.003
New World mouse					
Sigmodon hispidus	1	1	1.5	0.1	0.003
Hispid cotton rat					
Ondatra zibethicus	2	1	1.5	1.1	0.03
Muskrat					
Rattus spp.	299	20	30.8	58.0	1.02
Old World rat					
Rattus norvegicus	7			1.8	0.05
Norway rat					
Rattus rattus	1			0.3	0.009
Roof rat					
Felis domesticus	2	1	1.5	0.8	0.02
Cat					
Artiodactyl	63			598.7	8.31
Sus scrofa	62	4	6.2	269.9	4.06
Pig					
Odocoileus virginianus	9	3	4.6	117.9	1.92
Deer					
Bos taurus	113	7	10.8	2895.8	34.32
Cow					
Caprine	6	2	3.1	68.9	1.19
Sheep/Goat					

Table 4. Atlantic Wharf: Species List (cont.).

	NISP	MNI		Wt., gm	Biomass, kg
		#	%		
UID Bird	163			83.4	1.14
Anas spp.	2	1	1.5	2.1	0.04
Duck					
Aix sponsa	1	1	1.5	0.2	0.005
Wood duck					
Branta canadensis	6	2	3.1	15.6	0.25
Canada goose					
Gallus gallus	41	4	6.2	38.5	0.57
Chicken					
Meleagris gallopavo	2	1	1.5	2.3	0.04
Turkey					
Columba livia	1	1	1.5	0.1	0.003
Rock dove					
Muscicapidae	3	1	1.5	0.2	0.005
Thrush					
UID Turtle	4			7.3	0.12
Emydidae	3			2.8	0.06
Pond turtle					
Malaclemys terrapin	2	1	1.5	3.1	0.07
Diamond-back terrapin					
Carcharhinidae	1	1	1.5	0.1	0.02
Requiem shark					
UID Fish	93			25.9	0.41
Lepisosteus spp.	2	1	1.5	0.5	0.02
Gar					
Ariidae	12			3.1	0.06
Sea catfish					

Table 4. Atlantic Wharf: Species List (cont.).

	NISP	MNI		Wt., gm	Biomass, kg
		#	%		
Arius felis Hardhead catfish	23	3	4.6	5.9	0.11
Bagre marinus Gafftopsail	3	1	1.5	1.1	0.02
Centropristis spp. Sea bass	10	2	3.1	5.2	0.11
Cynoscion spp. Seatrout	2	1	1.5	0.2	0.01
Pogonias cromis Black drum	1	1	1.5	3.2	0.09
Sparisoma spp. Parrotfish	1	1	1.5	0.1	0.002
Paralichthys spp. Flounder	3	1	1.5	0.7	0.02
UID Vertebrate	____	_		157.9	_____
TOTALS	2826	65		9221.5	108.86

Table 5. Atlantic Wharf: Summary.

	MNI		Biomass	
	#	%	kg	%
Domestic Mammals	13	20.0	39.57	89.9
Domestic Birds	5	7.7	0.573	1.3
Wild Mammals	5	7.7	2.0	4.5
Wild Birds	6	9.2	0.34	0.8
Aquatic Reptiles	1	1.5	0.07	0.2
Fish and Sharks	12	18.5	0.402	0.9
Commensal Taxa	23	35.4	1.046	2.4
TOTALS	65		44.001	

Table 6. Atlantic Wharf: Element Distribution.

	Rats	Pig	Deer	Cow	Caprine
Head	71	32		38	
Axial	75				
Forequarter	64	9	3	4	2
Forefoot		2		8	2
Foot	13	9	2	14	
Hindfoot	1	5		30	1
Hindquarter	83	5	4	19	1
TOTALS	307	62	9	113	6

Rats include Rattus spp., R. norvegicus, and R. rattus.

Table 7. Atlantic Wharf: Epiphyseal Fusion, Pig.

	Unfused	Fused	Total
Early Fusing:			
Humerus, Distal			
Scapula, Distal	1	2	3
Radius, Proximal			
Acetabulum			
Metapodials, Proximal			
1st/2nd Phalanx, Proximal	5	1	6
Middle Fusing:			
Tibia, Distal	1		1
Calcaneus, Proximal	2		2
Metapodials, Distal			
Late Fusing:			
Humerus, Proximal			
Radius, Distal	1		1
Ulna, Proximal	2		2
Ulna, Distal			
Femur, Proximal			
Femur, Distal		1	1
Tibia, Proximal	—	—	—
Total	12	4	16

Table 8. Atlantic Wharf: Epiphyseal Fusion, Deer.

	Unfused	Fused	Total
Early Fusing:			
Humerus, Distal		1	1
Scapula, Distal			
Radius, Proximal		2	2
Acetabulum			
Metapodials, Proximal			
1st/2nd Phalanx, Proximal	1		1
Middle Fusing:			
Tibia, Distal		1	1
Calcaneus, Proximal			
Metapodials, Distal			
Late Fusing:			
Humerus, Proximal			
Radius, Distal			
Ulna, Proximal			
Ulna, Distal			
Femur, Proximal			
Femur, Distal			
Tibia, Proximal	1	1	2
Total	2	5	7

Table 9. Atlantic Wharf: Epiphyseal Fusion, Cow.

	Unfused	Fused	Total
Early Fusing:			
Humerus, Distal			
Scapula, Distal			
Radius, Proximal			
Acetabulum			
Metapodials, Proximal			
1st/2nd Phalanx, Proximal	1	11	12
Middle Fusing:			
Tibia, Distal	7	3	10
Calcaneus, Proximal	7	1	8
Metapodials, Distal		3	3
Late Fusing:			
Humerus, Proximal			
Radius, Distal			
Ulna, Proximal			
Ulna, Distal			
Femur, Proximal	1		1
Femur, Distal	1		1
Tibia, Proximal	1	1	2
Total	18	19	37

Table 10. Atlantic Wharf: Epiphyseal Fusion, Caprine.

	Unfused	Fused	Total
Early Fusing:			
Humerus, Distal		1	1
Scapula, Distal			
Radius, Proximal			
Acetabulum			
Metapodials, Proximal			
1st/2nd Phalanx, Proximal			
Middle Fusing:			
Tibia, Distal			
Calcaneus, Proximal			
Metapodials, Distal	1	1	2
Late Fusing:			
Humerus, Proximal			
Radius, Distal			
Ulna, Proximal			
Ulna, Distal			
Femur, Proximal			
Femur, Distal			
Tibia, Proximal	–	–	–
Total	1	2	3

Table 11. Atlantic Wharf: Modifications.

	Cut	Hacked	Burned	R. gnawed	C. gnawed	Worked
UID Mammal	35	123	198	12		
Muskrat			1			
Rats			2			
Artiodactyl	5	2	3	1		
Pig	1	5	6	2	1	
Deer	2	6	3	1		
Cow	3	33	19	3	1	
Caprine		4		1		
UID Bird		1	22			
Chicken	2		5			
Turkey			1			
Thrush			2			
Pond turtle			1			
UID Fish			4			
Gar			1			
Hardhead catfish			2			
Sea bass			2			
Flounder			1			
UID Vertebrate	—	—	—	—	–	2
TOTALS	48	174	273	20	2	2

Rats include Rattus spp. and R. norvegicus.

Appendix B. Atlantic Wharf: Measurements, in mm.

Taxon	Element	Dimension	Measurement, in mm
Odocoileus virginianus	1°Phalanx	Bd	12.0
Bos taurus	Tibia	Bd	68.5
	Astragalus	GLm	59.6
		GLl	64.8
	Metacarpus	Bd	54.4
	Metatarsus	Bd	56.9
	1° Phalanx	Bd	29.7, 31.9, 33.5
		Bp	28.4, 31.4, 33.6
		GL	62.5, 63.0, 79.5
	2° Phalanx	Bd	23.9, 25.4, 25.6
		Bp	27.6, 27.7, 31.5
		GL	37.2, 40.0, 44.6
	3° Phalanx	GL	37.0
		Bd	20.0
Caprine	Metacarpus	Bd	28.0
Branta canadensis	Scapula	Dic	11.1
	Humerus	Bd	24.2
	Femur	Bd	18.7
		Dd	15.6
	Tibiotarsus	Bd	16.2
		Dd	16.8
Gallus gallus	Scapula	Dic	10.0
	Humerus	Bd	14.6
	Ulna	Bp	10.3
		Dip	14.7
		GL	76.5

Appendix B. Atlantic Wharf: Measurements, in mm (cont.).

Taxon	Element	Dimension	Measurement, in mm
Gallus gallus	Carpometacarpus	Bp	10.4, 13.2
		Did	6.5
		GL	30.9
	Femur	Bd	15.1
		Dd	10.4
	Tibiotarsus	Dip	20.2, 20.6
		Dd	13.1, 12.2
		Bd	11.7, 12.2
	Tarsometatarsus	Bp	11.9, 12.1
		Bd	16.1
Pogonias cromis	Otolith	Length	2.4

Appendix A. Atlantic Wharf: Field Specimens (FS #) Examined.

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6
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Chapter VI
Archaeological Interpretations

The focus of this discussion, and that of most archaeological studies, is an exploration of how Charlestonians changed, and were changed by, their interaction with the land. Examination of the physical attributes of the archaeological record at Atlantic Wharf serves as a link to a broader examination of certain aspects of Charleston's evolution as an urban center, through the paradigm of landscape studies. Following the lead of geographers, a landscape perspective attempts to form linkages among material, social, behavioral, ideological, and natural elements in a region of study (Zierden and Stine 1996).

Evolution of the urban landscape has been the principal focus of archaeological research in Charleston for the past fifteen years. This broadly-based study encompasses previously discrete topics, such as diet and subsistence strategies, terrain alteration and site formation, health and sanitation, and ideology. The limited archaeological data from an area of 'filled land' is amenable to study of a few topics included under this landscape paradigm. Discussed here are the issues of site formation, health and sanitation, and artifact patterning as reflected in the fill of Charleston's waterfront.

Site Formation Processes

A basic question guiding most archaeological analyis, though one rarely articulated in such basic terms, is "how did these artifacts get here?" An often unarticulated assumption prefacing archaeological studies is that the artifacts were discarded, or otherwise left behind, by the previous site residents - and them only. On an isolated, rural site, this is a fairly safe assumption. On congested urban sites, where physical restrictions (property boundaries) are somewhat in conflict with the cultural and physical requirements for a healthy and organized living space, this assumption has been tenuous at best. For urban residents clearly moved great quantities of earth and their contents for various reasons. That such movement occurred on residential properties was demonstrated through recent excavations at the Miles Brewton house and the 14 Legare site (Zierden 2002; 2001a, 2001b). Therefore, it is critical to examine the source of archaeological deposits in order to analyze them in proper context. Such studies, then, consider site formation processes, as defined by Michael Schiffer (1977, 1983) and others (see Honerkamp and Fairbanks 1984).

In his path-breaking articles, Michael Schiffer has suggested that cultural materials enter the archaeological record by four basic methods: discard, loss, destruction, or abandonment (Schiffer 1977). Discard, the throwing away of refuse, is the most common form of archaeological site formation. Artifacts and other debris are either broadcast on the ground surface, gradually forming zone deposits, or placed in newly dug (trash pit) or previously existing

holes, (such as abandoned wells, privy pits, etc), called features. Items deposited due to loss are usually small, such as buttons, coins, toys, bits of jewelry, etc. Archaeologists often discover lost items in wells and drains, or soil lenses that collect beneath wooden floors. Abandonment of material culture may follow a disaster, such as fire or storm, or may occur when residents leave a property for some reason. Abandonment may also be tied to destruction, of buildings and their contents from fire or storm, for example. In some cases, it is possible to distinguish entire proveniences (the defined archaeological boundaries of single behaviors) resulting from specific depositional processes. A destruction deposit may be reflected in artifacts that are burned from a fire. More often, a provenience contains artifacts from a combination of events; a lost button may be included in a pile of deliberately discarded kitchen refuse. All of the above events can result in actively-used material items becoming archaeological.

Once in the ground, artifacts can be redistributed, or they can be removed (Ascher 1968; Honerkamp and Fairbanks 1984; Schiffer 1983). Such redistributed deposits have been described by Schiffer as secondary, those that have been removed from their original placement in the ground. Nearly all of the urban deposits are secondary, if not tertiary. Archaeological deposits can also be removed, as when an area of soil or refuse is loaded up in a wagon and deposited elsewhere. Modern construction in Charleston entails a good deal of removal of old (archaeological) soil and replacement with new (sterile) soil. Such movement occurred in the 18th and 19th century, as well. Usually the archaeological record is a combination of all three events - introduction, redistribution, removal.

The midden deposit recovered from Atlantic Wharf, then, is clearly a 'redistributed', in fact a 'removed' deposit from elsewhere. We know such material as 'fill'. Fill is the deliberate introduction of soils, and their contents, to produce a more desirable ground surface. Since these materials were clearly generated from another, unknown location, it is not possible to ascribe ownership, or even agency, to the materials. Archaeologists have traditionally concentrated their research efforts on primary deposits, or those that have remained in place since they were originally discarded. Secondary, or fill, deposits, removed from their original location, were considered "disturbed", and thus incapable of providing reliable information. It also seems likely, from both the contents of this particular assemblage, and from the documentary and cartographic data available on Charleston wharves in general, that a portion of the refuse collected here was deposited here as primary refuse, either from docked ships, waterfront workers, or both. Figures 6 and 7 suggest that the mud banks between the wharves, exposed at low tide, received a considerable amount of casual debris.

Archaeologists working in urban areas, however, have found that such reorganization is actually a true reflection of urban behavior (Honerkamp et al. 1983). These scholars have convincingly argued that fill is in fact an artifact of the urban landscape and as such is an important source of data (Beaudry 1987; Brown 1987a, 1987b; Honerkamp and Fairbanks 1984). They further charge archaeologists with developing analytic techniques appropriate to the resource. Expanding the scale of study from a household to a 'neighborhood' level of study is the most common suggestion (Honerkamp 1987; Rothschild 1985; Zierden and Calhoun 1987). A

first step in expanding to a neighborhood level of research could be to define a neighborhood in physical and social terms.

For the purposes of this study, however, the authors propose to work backwards. Twenty years of archaeological research in Charleston has produced a data base that, though uneven and incomplete, has allowed some preliminary definition of site function and social affiliation as reflected in archaeological patterning. We therefore propose to compare the cultural and faunal assemblage from Atlantic Wharf to various groups of Charleston sites. From here we will propose a temporal, social, and possibly physical, source for the refuse deposited on site.

Such analysis is complicated by the possibility that a portion of the refuse was generated on site. The proportions of Spanish and Caribbean ceramics, for example, do not match those from any other location in the city to date, and may indicate some on-site, waterfront activity. Regardless of our level of success in pinpointing a source for the Atlantic Wharf refuse, it remains clear that the materials are significant as a source of city-wide data, that they inform on the purchasing and use options of Charleston residents and on their development of an urban landscape.

Artifact Patterning

In 1977 Stanley South published the seminal work *Method and Theory in Historical Archaeology*. In this work, South proposed an analytical method which classified artifacts by function. The seven functional groups - kitchen, architecture, arms, clothing, personal, furniture, tobacco, and activities - covered the range of domestic activities at British colonial sites. South went on to note that there were broad regularities in the relative proportions of these artifact groups across colonial, and possibly Federal, America, reflecting the 'typical' range of activities on domestic sites. He termed this regularity the Carolina Artifact Pattern. Any deviation from the pattern should reflect different activities across the site.

Since 1977, South's pattern recognition approach has been widely used by historical archaeologists on varying levels. South himself (1988) has argued that pattern recognition should be simply a first step in studying cultural processes responsible for behavior reflected in artifact patterning. Subsequent researchers have suggested changes in the placement of certain artifact types (Garrow 1982; Deagan 2002). Others have named a variety of patterns, designed to elucidate variation in the material culture on rice plantations, cotton plantations, yeoman farm sites, urban, public, and industrial sites (see Jackson in Zierden, Drucker and Calhoun 1986).

South's methodology has always been used as an organizing tool for the Charleston artifact assemblages, allowing for direct intersite comparison. In the past decade, it has become apparent that a variety of factors influence artifact patterning, ranging from human behavior to the physical site formation processes to technological developments and marketing trends in the

material culture itself. Julia King (1990) has proposed a different classification scheme for the analysis of intersite spatial patterning at colonial sites in the Chesapeake region; she subsequently applied this technique to a lowcountry plantation site (King 1992). This technique considers domestic artifacts and architectural materials separately. Following her example, various classes and types within the kitchen and architecture group are considered separately.

Throughout the past decade, the material culture from Charleston has been subdivided temporally for sites occupied throughout the city's three hundred year history. These temporal subdivisions are based on specific site events and general trends in Charleston's development. Charleston proveniences and their materials have generally been divided into three periods: 1670 to 1760, 1760 to 1830, and 1830 to 1900. The early period corresponds to Charleston's role as a frontier outpost and emerging port city. The second marks Charleston's 'golden years' as a leading seaport and center of wealth, and the third corresponds to Charleston's economic decline and stagnation. These periods also correspond to changes in ceramic and glass technology. The early period is that of relatively sparse and expensive material culture, the second corresponds to the rise of the British pottery industry and the development of refined earthenwares, and the third to a decline in new ceramic types and the ascendancy of mass-produced glass containers. The Atlantic Wharf midden falls clearly into the second category, and so will be compared to the Charleston average and to a variety of contemporary urban assemblages.

Table 12
Comparison of Atlantic Wharf to General Patterns
(% of total assemblage)

	Test Pit 1	*Test Pit 2*	*Atl. Wharf Total*	*Charleston Average*	*Carolina Pattern*
Kitchen	83.8	55.88	64.9	58.5	60.3
Architecture	10.9	37.8	29.1	33.6	23.9
Arms	.2	.25	.23	.3	.5
Clothing	.53	1.14	.94	1.13	3.0
Personal	.13	.12	.13	.45	.2
Furniture	-0-	.01	.01	.20	.2
Pipes	3.41	4.05	3.84	4.45	5.8
Activities	.94	.65	.74	1.31	1.7
Mean Ceramic Date	1787.0	1786.7			
Terminus Post Quem	1795	1795			
Date of Deposition (est.)		c.1800			

The midden deposits from the two units, though separated spatially, appear to be the same

event. This was evident in the field, as both held the same stratigraphic position and exhibited the same soil characteristics. The fact that the band of midden was narrower in the more easterly unit, though may suggest a 'dump' outside of a cribbing, and thus one more casual than deliberate fill. The content, though similar, was not identical, as shown above. To test this, Stanley South's Mean Ceramic Date formula was applied to the two assemblages (South 1972). Close agreement of the Mean Ceramic Dates from the two units supports the theory that they are the same deposit. Differences in the artifact proportions in the two units may reflect some on-site refuse disposal; this is particularly true for the varying amounts of window glass, reflected in the variation in the architecture group. The other spatial cluster noted in the field and in the laboratory is the presence of one-hole button discs in Test Pit 2; this may also be an idiosyncratic deposition. Generally, though, the proportions of various artifact types suggest homogeneity, rather than variation. It is therefore logical to consider the assemblage as a whole, and the averages as reflecting the overall characteristics of the midden deposition. The close agreement of dates, both between the Mean Ceramic Date and the Terminus Post Quem, and between the individual units likewise suggests a single depositional event rather than a gradual accumulation. On a colonial waterfront, this would mean that the midden was mostly deliberately-deposited fill material as part of active wharf construction, rather than the daily discard of those living and/or working on the property.

The small, but consistent, presence of artifacts from the clothing, personal, and furniture group support the idea that this midden is residential in origin. Close agreement with the Carolina Pattern and the average from Charleston residential sites follows South's contention that these proportions reflect the regularity of domestic life. There is not enough variance from these patterns to suggest a non-domestic, or idiosyncratic, deposition of refuse (such as discard of goods damaged in shipping prior to transport to retail shops). The relatively small amount of architectural debris, in contrast, may suggest that the discard did not included artifacts from demolition, remodeling, or construction on domestic sites. Perhaps the most directly comparable assemblage may be Feature 226 from the 14 Legare property, a large lense of undisturbed domestic refuse from the adjoining lot at 27 King Street (Zierden 2001:5-26). This c. 1770 midden contained quantities of bone and ceramics; in fact, kitchen artifacts comprised 76% of the assemblage, with a proportional decrease in architectural debris. Feature 226 was an undisturbed deposit, interpreted as a discrete 'haul' of kitchen refuse. The other categories, particularly clothing, personal, and furniture, were recovered from feature 226 in proportions similar to Atlantic Wharf.

Table 13
Comparison of Atlantic Wharf
to Feature 226, 14 Legare Street
(% of Total Assemblage)

	Test Pit 1	*Test Pit 2*	*Feature 226*
Kitchen	83.8	55.8	76.4
Architecture	10.9	37.8	18.1
Arms	.20	.25	.06
Clothing	.53	1.14	.70
Personal	.13	.12	.06
Furniture	-0-	.01	.06
Pipes	3.41	4.05	3.2
Activities	.93	.65	1.2

Having established that the Atlantic Wharf assemblage appears to be largely residential refuse, imported as fill, we may turn our attention to the possible source of this refuse. Geographic location of this source is impossible to pinpoint. It is tempting to suggests that efficiency would dictate that the refuse had not traveled "far", that it came from the residential areas of the colonial city in close proximity to the waterfront, possibly just west of East Bay Street. The c. 1800 date of the fill suggests that the midden was deposited too early to represent mercant's homes on the east side of the thoroughfare (see, for example, figures 31 and 32, as well as figures 6 through 10). This is, unfortunately, impossible to determine. We may, however, investigate the possible social and/or economic affiliation of the refuse generators by comparison of particular artifact categories that reflect socioeconomic status.

These artifact categories have been measured and compared from a variety of elite and middle-class townhouse sites in Charleston (Zierden and Calhoun 1990). These categories include proportions of creamwares, Oriental porcelains, and table glass (which are presumed to reflect the purchasing power of wealthy white Charlestonians), in relation to colono wares (presumed to reflect the possessions of African-American residents). The relatively small categories of clothing, personal, and furniture items are also presumed to reflect "luxuries", those items afforded by, used by, and lost or discarded by, those of means. Comparison of these proportions across Charleston are below. The Motte-Alston assemblage from the Miles Brewton site and the late 18th century assemblage from the 14 Legare Street may be the best measure of elite purchasing power. The 66 Society Street and First Trident sites, averaged together, reflect those of more moderate means. The average of these sites together, plus two other elite properties, form the currently-existing "1760-1830 Charleston average".

Table 14
Status Variables in Charleston Artifact Assemblages

	At. Wharf	*Motte-Alston*	*14 Legare*	*Mid-class*	*Charleston average*
porcelain, % ceramics	3.8	15.3	11.5	7.64	17.56
creamware, % ceramics	53.1	16.6	32.2	23.8	20.6
colono ware, % ceramics	1.47	8.2	12.18	3.73	4.9
tablewares, % ceramics	85.8		72.9	77.4	81.9
table glass, % kitchen	4.30	3.3	2.9	.41	.94
Clothing-personal-furniture, % total	1.08	1.78	1.56	.80	1.78

The above figures suggest some patterning, but the variables are mixed. This may represent idiosyncracies in the imported domestic refuse, or it may again suggest that the Atlantic Wharf midden is a mixture of imported fill and on-site refuse disposal. The relative lack of porcelain would suggest a middle-class, rather than elite source of debris. This is suggested by the faunal remains, as well (Reitz, this volume). This is mirrored in the relative paucity of the clothing-personal-furniture items. The unusually high proportion of table glass and creamwares, in contrast, would suggest some specific depositional activity, which may have been on-site, or part of an unusual behavior at the source of the domestic debris.

If the proportions of table glass and creamware hint at some on-site refuse disposal, then the presence of Spanish Caribbean wares - and fish - strongly support it. The El Morro ware, Greyware, and other earthenwares from Spanish sources have been recovered on Charleston domestic sites, but not in such high proportions. Likewise, Elizabeth Reitz interprets the presence of the parrot fish as irrefutable evidence of goods brought from the Caribbean. That these wares were deposited directly from a docked ship, rather than from an intermediary domestic site, seems most plausible. Unfortunately, neither quantification nor visual inspection of the soil, artifacts and ecofacts provide firm evidence for the source - or sources - of the refuse. The current data point to a mixture of site forming events, with the majority of refuse present as imported fill.

As a British colony governed by the mercantile policies of England, Carolina was obligated to purchase only British goods, or those transshipped through English ports. A small number of French, Spanish, and Caribbean wares have been recovered on 18th century sites throughout the city, however. There are many possible sources for these wares - visitors, newly arrived settlers, illegal trade, and privateering are but a few sources. An inter-colonial trade with Caribbean colonies was a mainstay of Carolina prior to 1730. Recently, archaeologist Michael Stoner has documented the presence of Barbadian redwares at the 1670 settlement of Charles Town (Stoner 2001), and some of these wares have been tentatively identified from early contexts in the

peninsular city, as well. Though likely Spanish in origin, the El Morro ware recovered at Atlantic Wharf, and elsewhere in the city, likely arrived in Charleston via the Caribbean, as this ware is most frequently reported from Puerto Rico and elsewhere (Deagan 1987; Smith 1962). The same is true for the Greyware. This source is strengthened by the recovery of the parrot fish, clearly of Caribbean origin. The source for the ubiquitous Olive Jar and the tin enamelled wares is more difficult to discern, as such wares were common throughout the Spanish colonial world. Taken together, these non-English ceramics point to the cosmopolitan nature of Charleston's colonial population, and the interconnection of the North American colonies, from New England to Virginia to the Caribbean.

Urban Health and Sanitation

An assumption underlying many anthropologically-oriented archaeological investigations is that human culture is affected by environmental conditions, both natural and cultural. An urban environment created environmental challenges not experienced by contemporary rural dwellers. The residents of the city were forced to adapt to a rapidly growing commercial center in which the common problems of everyday life were exacerbated by population density. The production and distribution of goods and services became increasingly complex and regulated. The necessarily more intensive utilization of land for a variety of purposes resulted in highly constricted residential and commercial areas in the urban core. This limitation of available space created a need for both formal and informal regulation of activities, as reflected in land values, legislation, and segmentation.

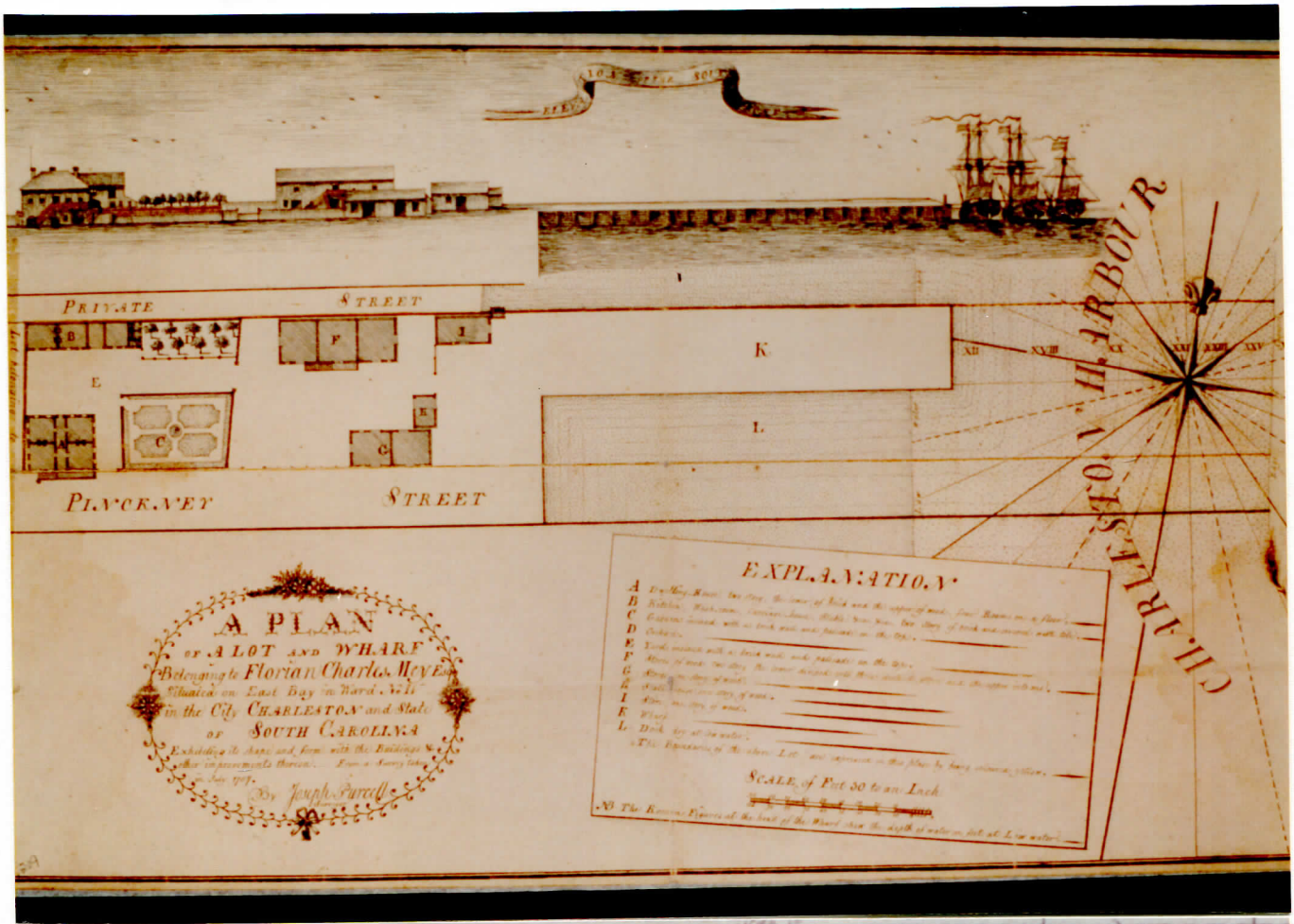
Residents of the city generated great quantities of refuse in limited spaces. The elite urban residents arranged their large lots in a manner that segregated the noxious chores and, to some extent, the resulting byproducts of these efforts; those on less spacious lots had fewer options. Archaeological study has revealed that the problems attendant with increased population escalated as the 18th century progressed. The deliberate placement of specialized service buildings, separation of work yards and gardens , and specific locations for refuse disposal were, by the early 19th century, conscious attempts to mold an urban landscape suitable to the social values and physical needs of urban residents. Further, the needs and values of Charleston's citizens changed as the 19th century progressed. Many of the visible changes made to properties during the antebellum period were connected with attempts to improve sanitation and prevent disease, while others were related to an increasing desire for privacy and fear of the slave population.

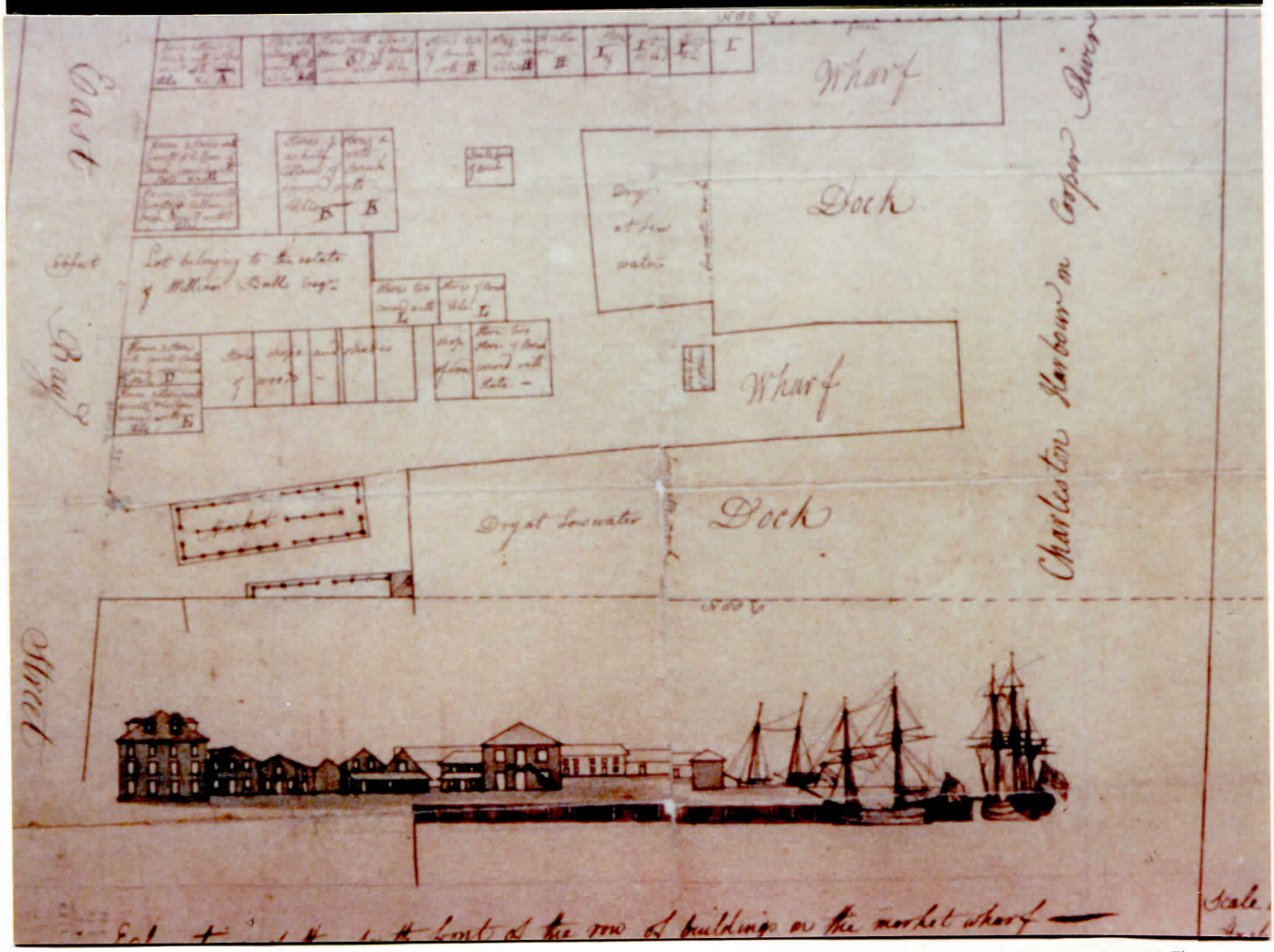
Poor sanitation practices ranging from open privies to rotting carrion in the streets nurtured a wide range of diseases; these were battled by citizen complaints and ordinances throughout Charleston's history. As scientists and citizens began to link cause and effect in the 19th century, they attempted, on both the individual and municipal levels, to ameliorate the situation. Both archaeology and documents reflect the widespread addition of paved work yards, cisterns, drains, and brick walls in the early 19th century. Many of the changes were aimed at reducing stagnant

groundwater, removing wastewater, and obtaining clean water for consumption. The filling of low, swampy lands was part of the first effort.

Analysis of the faunal remains recovered from residential sites - drain fill, trash pits, and other work yard midden proveniences has also provided information on urban sanitation and the relative success of those efforts. Elizabeth Reitz (1997, 2000, this volume) has determined that such animals as rats, mice, toads, cats, and dogs comprise 10.6% of the urban faunal assemblages. These non-food animals are only 4.3% of contemporary rural faunal assemblages (Reitz 1986). This suggests that the crowded conditions of the city and resulting sanitation problems bred an increased level of the vermin associated with human activity. It is interesting to note that this presence is reduced on the elite sites, to 7.7% of the faunal assemblages. This figure suggests that the efforts of the elite to segregate refuse, pave work areas, and remove waste water were somewhat successful.

The overwhelming number of rat remains (31% of the individuals) in the Atlantic Wharf faunal assemblage, then, speaks volumes on the conditions of the early 19th century waterfront. The fill beneath the docks and wharves along the waterfront were evidently teeming with vermin. Reitz suggests that the movement of refuse from domestic properties to the water's edge attracted the vermin, as well. Further, Reitz found no physical evidence of efforts aimed at controlling the waterfront rats during deposition of the refuse. It is likely that this was accomplished only when the refused was covered by additional layers of fill. As wharves were continually expanded to the east, it is likely that the vermin population simply moved, and did not disappear. The Atlantic Wharf data, then, provide graphic evidence of failure to control refuse and associated vermin in the 19th century city.





Figures 31 and 32: plats and etchings of Mey's Wharf (1787) and Market Wharf (1805)

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