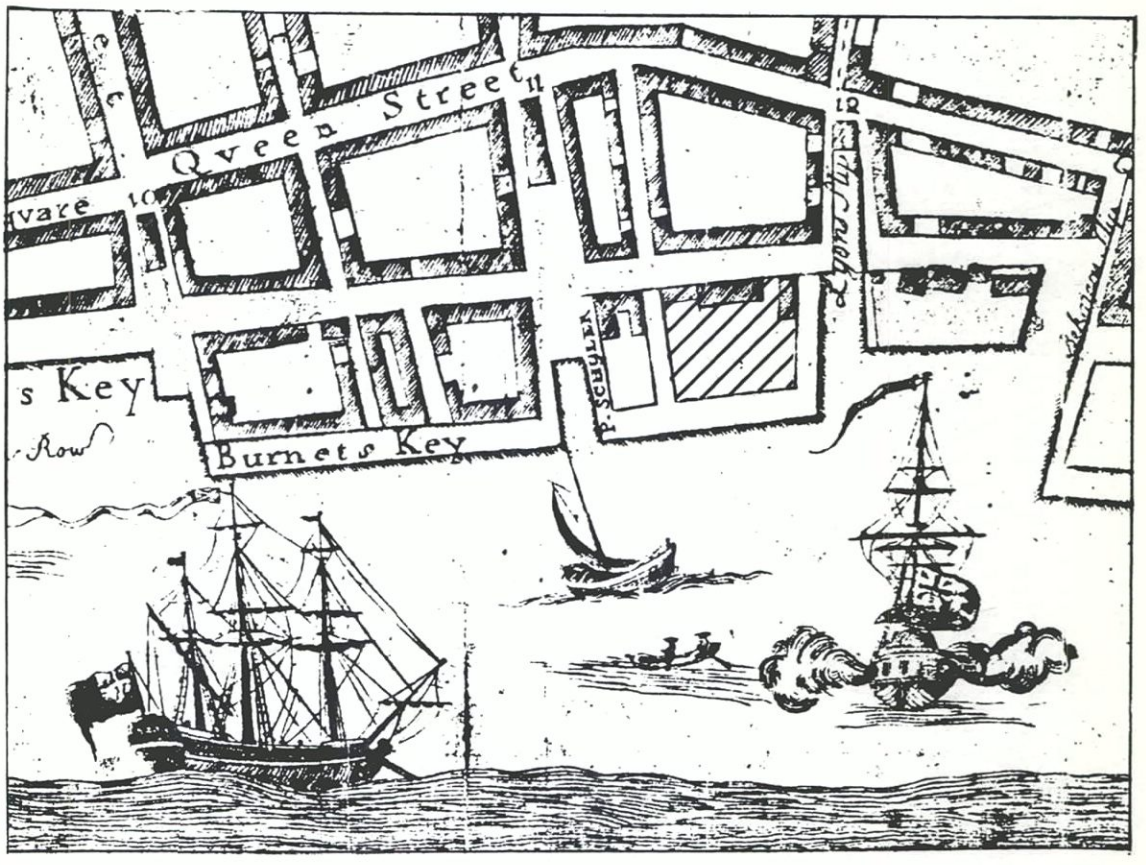
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The Archaeological Investigation of the 175 Water Street Block New York City

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THE ARCHAEOLOGICAL INVESTIGATION OF THE 175 WATER STREET BLOCK NEW YORK CITY

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Prepared for
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CHAPTER 4: ARTIFACT ANALYSIS

This chapter presents the analysis of selected artifacts from a tabulated assemblage of approximately 310,000 counted objects recovered from the 175 Water Street excavations. This number does not include the bone material from most landfill or the architectural and building materials, which were weighed in the lab, or the shell, brick, and stone weighed and discarded in the field. The weighed assemblage comprises approximately 17 tons of material. Although 18 samples from features were analyzed, it also does not include any microscopic seeds (micro-flora) from the site nor the seed, pits, and fragments of larger flora (macro-flora) from non-feature assemblages. In addition, non-mammal fauna from the Ronson Ship fill were not tabulated in any form. Had all these materials been counted, it is estimated that over one and one half million artifacts would have been tabulated.

To organize the assemblage for analysis, a computer program, the ARDVARC system, was initiated and will be described. Artifacts were coded and analyzed by categories with particular time and attention spent on the ceramics and glass and selected fauna and micro-flora from occupation-related features. The analysis of these artifacts will be presented as reported by the various analysts. It should be noted that while artifact categories were analyzed with varying degrees of intensity, with the exception of the categories mentioned above, the 175 Water Street artifact assemblage is tabulated for future analytic research. These data, as well as excavation and laboratory processing information, tabulation sheets, photographs, and drawings -- the information relative to using the collection -- and the artifacts themselves will ultimately be available to scholars through the South Street Seaport Museum, the recipient of the collection.

It will be seen that information from the artifact analysis was invaluable in deciphering the process and chronologies relating to original fill (Chapter 5); it was equally invaluable to the interpretation of the activities of the occupants of the 175 Water Street block (Chapter 6). These artifacts represent the manifestations of the behavior of people long gone: they are the material record of their activities, processes, and behavioral patterns; detailed analysis can suggest how these factors changed over time.

Each section in this chapter -- the reports on computer analysis, laboratory methods, glass, ceramics, feature dating and function, small finds, coins, fauna, flora, leather, and pipes -- while part of an analytic whole, is presented as a complete report; each includes relevant tables, figures, photographs, appendices, and bibliographies. The codes and translations related to computer tabulations and analyses will be available with the collection at the South Street Seaport Museum.

COMPUTER ANALYSIS
(Mitchell T. Mulholland)

Because of the volume of artifactual data from the 175 Water Street site, computer analysis was determined to be necessary in order to analyze laboratory information in a cost effective and timely manner. Computer analyses were conducted by Mitchell T. Mulholland and Robert Hasenstab of the Department of Anthropology at the University of Massachusetts at Amherst.

All data concerning artifact characteristics were recorded on computer coding forms (e.g. see Ceramic Figure 4.2, this chapter) and analyzed using the ARDVARC archaeological data management system (Mulholland 1980). Coded information was entered on an ENTREX data-entry computer and transferred to a Control Data Corporation Cyber 175 on magnetic tape. The computer system is located at the University Computing Center at the University of Massachusetts. The completed data base for the 175 Water Street project consists of 48,961 128 column records (approximately 6.3 megabytes).

The use of the ARDVARC system allowed laboratory analysts to record shorthand artifact identification codes, attributes and provenience on coding forms. The system then enhanced the data base by adding English translations, dates where appropriate, and other variables based on coded entries. Once the data base was entered on the computer system, numerous analytical programs were run and computer reports were provided to the laboratory analysts for report writing. These reports included: aggregation of all catalog data into analyzable features, translation of artifact codes, assignment of analysis classes to all recorded items, file building, editing, maintenance and data retrieval reports, mean ceramic and glass date reports by both fragments and minimum number of vessels, ceramic reports by vessel number and minimum number of vessels, numerous formatted listings such as: small finds by feature, small finds by catalog number and code, fauna and flora by catalog and feature, artifact reports by analytical class, etc.

Numerous reports were generated using SPSS (Statistical Package for the Social Sciences). ARDVARC provided extract files for the SPSS system thereby reducing processing costs. SPSS reports included: cross tabulation of macro-flora by seed type and feature, fauna by type and feature, ceramic ware by feature and stratum, ceramics by country of origin by feature, leather by type and feature, glass by type and wear, glass by place of origin, glass by commercial-vs-domestic usage, chi-square analysis for faunal data, discriminate analysis for all features testing a model of commercial-vs-domestic origin, etc. At the end of the project, summarized and detailed artifact catalogs were run for all artifacts analyzed. Computer graphics in the form of bar and pie charts were generated for analytical purposes and for inclusion in the final report. To accomplish this the ARDVARC system interfaced with DI=3000, a sophisticated graphics-software package. A copy of the data base is being maintained for posterity in a controlled environment.

COMPUTER ANALYSIS: BIBLIOGRAPHY

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LABORATORY METHODS
(Patricia Seabury)

The general goal of the laboratory phase for the 175 Water Street Project was to clean, to separate into categories, and to generally prepare the artifact assemblage for analysis and storage. The laboratory processing began the third week of November, 1981. Four technicians and one lab director were initially involved in this work at the 163 Front Street lab space. At the end of January, 1982, after the completion of fieldwork on the ship, the major lab activities were moved to 106 Fulton Street. During the month of February, participation in the fieldwork on the ship and establishing laboratory space at 106 Fulton Street temporarily halted artifact processing.

In conjunction with the excavation of the ship, four technicians under the supervision of Sheli Smith began processing ship-related materials at the 163 Front Street lab space. They washed the artifacts from the ship and tabulated them into broad categories. To desalinate the artifacts after tabulation, they were placed in fresh water that was changed every three days. After desalinization, most of the artifacts were allowed to dry; however, selected artifacts remained wet for conservation purposes. At the completion of fieldwork, ship laboratory operations were combined with those at the 106 Fulton Street laboratory.

The processing of artifacts was primarily done in two stages. The first occurred during the excavation of the backyard areas on the block where bags of artifacts were brought into the lab and sorted by catalogue number. They were then logged into a book (the "Blue" book) that consecutively lists the catalogue numbers used by the three crew chiefs in the field. Anne Donadeo used numbers 1 through 683, Valerie DeCarlo 5000 through 5387, and Jay Cohen 8000 through 8245. The bags were also recorded in a cross-reference book which was first organized by lots, then, within each lot, each was listed by the locus number and corresponding catalogue number of each bag.

Next, the bags were placed in designated areas by lot and organized consecutively by catalogue number. Bags of artifacts to be washed were selected arbitrarily from every lot or at the specific request of field or lab personnel. The wash date was also recorded in the "Blue" book.

During the washing process, the artifactual material was placed in sieves within tubs of water and washed with toothbrushes. Bricks, dry metal, and objects too delicate to be water soaked and scrubbed were dry brushed. The washed artifacts were then placed on trays constructed of wood and 1/8-inch hardware cloth and left to dry in a vertical drying rack.

After the artifacts were completely dry, they were separated into gross categories of ceramics and pipes, glass, fauna, flora, building materials, and small finds. The sorted materials were then placed in plastic ziploc bags identified with the identical locus number and catalogue number documented on the original field bag, placed back into that same bag, and shelved. The date of the sorting was then recorded in the "Blue" book.

The second stage of processing was begun only after the laboratory was moved to 106 Fulton Street. Once the fieldwork was completed on both the backyard area and ship, it was decided that specific analysts would analyze the various artifact assemblages excavated from the block. Also, after the completion of fieldwork, both the field director, Steve Nicklas, and the three previously mentioned crew chiefs compiled a list of all features or suspected features on the site. This list, broken down by lot and unit and associated catalogue numbers, was given to the lab director. Each analyst was given a copy of this list as a guide to determine which artifacts were to be analyzed as feature material. This feature breakdown necessitated a slight change in the sorting process.

From this point on, all classes of feature artifacts were discreetly separated (for example, pipes were removed from ceramics, nails from building materials) and bagged in plastic. To guard against the possible fading of the ink used to mark the plastic bags, masking tape was stapled to the bags, and in addition to the site name, locus and catalogue numbers were written on the tape. Cardboard boxes with exterior identification labels were made for each of the feature lot/unit designations. All artifacts corresponding to the feature listings were placed in appropriate boxes and shelved. At this point, any analyst could remove artifacts from these boxes for analysis.

Numbering of artifacts was limited mainly to glass, ceramics, and pipes identified as coming from features. Each artifact was numbered with the state number assigned to the 175 Water Street excavations, 1271, and also with its catalogue number. In addition, each artifact was numbered consecutively within a catalogue number. For example, the twentieth consecutively numbered artifact from catalogue number 547 would be labelled: 1271 547.20. The range of consecutive object numbers was recorded in the "Blue" book. Any artifacts identified as needing conservation were recorded on conservation sheets and ideally were removed to the conservation laboratory at Groton, Massachusetts for treatment.

As previously mentioned, site features were designated after fieldwork was complete. In the lab, at a later date, accumulated loci from within features were assigned feature numbers based on presence within an occupation-related feature, such as a privy or cistern, or association with building-related activities (see Artifact Appendix A). These feature deposits were then divided into levels based on field interpretation and soil evidence, but occasionally laboratory analysis redefined some level assignments (see Glass and Ceramic sections, this chapter). In all, 57 features were identified. Glass and ceramics, as well as selected faunal material recovered within these features, were intensively analyzed, but all artifactual material from these deposits was analyzed in some detail. Also analyzed in detail were artifacts identified as ship-related objects. These were analyzed by Sheli Smith, co-director of the ship excavation (see Ship report, Chapter 6).

The material designated as non-feature included selected artifacts from destruction debris and all sheet refuse and landfill from both the backyard and ship excavations. As noted in Chapter 3, it also included the actual structural elements of features, such as the stone or brick walls of cisterns and privies or the wood from barrels or floors. The non-feature catalogue numbers were grouped by lot/unit designations and a list was prepared (see Artifact Appendix A). Since the method used in the 163 Front Street lab to broadly tabulate the non-feature ship artifacts did not meet the general parameters used in the non-feature analysis, glass and ceramic artifacts recovered during ship excavations, all of them designated as non-feature, were re-analyzed.

As noted previously, feature ceramics and glass were analyzed by specialists, the former by Nancy Stehling, the latter by Joseph Diamond. Faunal material was analyzed by four individuals. A major faunal report by Dr. Kathleen Biddick deals with domesticated mammals mainly from privy excavations and several selected features (see Faunal analysis, this chapter). The remaining faunal material from yard features was analyzed by the other analysts and was usually identified broadly as unspecified mammals, birds, and reptiles (obviously identified species were often noted). Fish remains from features were separated from other faunal material and bones were partially tabulated; fish scales, however, were merely bagged for future analysis. The mammal faunal assemblage recovered during ship excavations was analyzed comparably to feature mammal material and served as the analyzed faunal sample from landfill.

As compared with the detailed analysis done on feature material, analysis of non-feature artifacts was usually very general. For example, non-feature ceramics were assigned broad ware types (such as creamware, pearlware, or redware) with relevant dates and were counted (see categories of computer printout for NF ceramics). Glass was assigned to categories of bottle, table, or window glass; each of these categories was also grossly identified and, when feasible, dated. While all feature pipes were tabulated by bore size, bowl decoration, and, when possible, country of origin, non-feature pipes were identified only as decorated or undecorated pipe bowls or stems (see computer printout, General Artifact Catalogue); both feature and non-feature pipe fragments were counted.

Brick, mortar, plaster, shell, miscellaneous construction materials (weighed in the field), and non-feature bone from the yard excavations (weighed in the lab) were tabulated as weights. With the exception of non-feature bone, which was weighed in grams to the nearest tenth, these artifact weights were ultimately computed into kilograms and tenths, the weight found on the computer tabulations.

Non-mammal ship fauna, non-feature building materials, non-feature macro-flora (pits and large seeds), and, with two exceptions (see Floral analysis, this chapter), all micro-flora (small or microscopic seeds) were the only artifact categories recovered from the site that were not tabulated in some manner. (It should be noted that some building materials from contexts initially considered features but subsequently reassigned as non-features, are found on the non-feature computer tabulation sheets.)

Selected flotation samples collected from features were processed to provide light and heavy fraction samples; unprocessed samples were ultimately discarded. Similarly, numerous soil samples from features were dried and Munselled to determine soil color (see Artifact Appendix B); unprocessed soil samples were also discarded.

At the completion of analysis, most artifacts were boxed by lot/unit with either feature or non-feature designations. The exceptions are boxes of pipes (3), small finds (except those from Lot 33) (2), flotation (12) and wood (4) samples, fish remains (2), miscellaneous materials from clearing in Lots 27 and 35 (1), and unprocessed and unsampled stray finds (4) which are stored together. In addition, ceramic and glass vessel mends and crossmends (42 boxes) are also shelved separately, but arranged by lots.

At this writing, these boxed artifacts are housed in a facility of the South Street Seaport Museum where they will ultimately be available for further research. Eventually, artifacts currently being conserved will be added to the collection.

GLASS ANALYSIS
(Joseph Diamond)

Introduction

The glass analysis at the 175 Water Street site was designed to provide information on dating, trade networks, social status, the nature of deposits (domestic versus commercial), and the correlation of artifacts and artifact-bearing deposits with the historical record. In some cases, the archaeological record was quite adequate; in others, it was sadly lacking or missing altogether.

The glass from the site was analyzed by feature and by lot. However, more attention and detail were given to feature than to non-feature artifacts. As discussed elsewhere (see discussion of minimum number of vessels, this section), the feature glass was laid out and mended to determine Minimum Number of Vessel (MNV) counts. This was not done with the non-feature, or general lot fill, material which was analyzed more grossly by catalog number within a lot. Whenever possible, particularly with unique or distinctive items that could be seen across several catalog numbers, MNV from non-feature glass was kept to a minimum. However, since several analysts worked on the non-feature material simultaneously, certain fragmented vessels, such as vials, wine/liquor bottles, tumblers, and pocket flasks, may have been counted more than once. MNV counts for these vessels from fill may therefore be somewhat inflated.

An aim of analysis was to divide features into commercial and domestic deposits; this division was based primarily on the presence or absence of wear. The rationale for this division was based on the assumption that glass vessels from a china and glass shop, which were perhaps received broken and quickly discarded, would not show evidence of use. Then too, at the most, wear would be slight if a vessel stayed on a display shelf for an extended period of time. At the other extreme, bottles or glass that were used, such as those from a domestic or residential deposit, would be expected to show wear patterns which are usually heavy to very heavy.

Based on these criteria, a major problem encountered was the occurrence in known commercial deposits of bottle glass, particularly wine/liquor bottles that have heavy to very heavy wear patterns. There are several possible explanations for this. First, commonly used bottles may have been "recycled" by a store's employees. Another explanation is that what we may be observing in the archaeological record is a combination of a commercial deposit within a domestic deposit. That is, deposits from a ground floor commercial establishment may be mixed with those from residences above. Finally, one may consider this as archaeological evidence for alcohol consumption on the job, a socially acceptable practice in the late-eighteenth to early-nineteenth century (Rorabaugh 1979; Levin, Rockman, and Harris 1982: personal communication).

For an in-depth description of the classification of feature function, see the introduction to the ceramics section. Also, see this section for features not discussed here but assigned functions or associations.

Function

For analytic purposes, function was broken down into broad categories such as bottle glass, table glass, window glass, and "other" glass. "Other" glass includes proof vials (see Glass Table 4.1), lamps, creme jars, mirrors, glass slides, etc.

In discussing function, it is possible to divide it into two categories. The first is the intended function of a vessel such as patent medicine, wine, olive oil, etc. The second is whether the artifact in question was used beyond a commercial activity, or whether it became part of the archaeological record prior to serving its intended function: for example, a drinking glass meant for home use but broken and discarded before being sold. The latter concept is particularly important at the 175 Water Street site since many of the deposits appear to be commercial.

In one sense, then, we are dating the features on the basis of wear pattern in addition to glass or ceramic dates. However, in some cases, these types have such a long date range that glass or ceramic manufacture dates alone are not appropriate. Rather it is possible to assign the deposits to specific occupations and dates based on the various frequencies of wear on bottle and table glass. For example, archaeological deposits apparently representing china and glass stores, such as those in Features 41 and 36, are usually characterized by slight or no wear in the table glass category. These may represent the reuse and/or resale of common holloware such as wine bottles (which make up a considerable portion of the glass assemblage). One reason for the lack of wear on certain bottles, such as medicines, may relate to their immediate use and discard. Consequently, bottles of this type normally get into an archaeological context quickly and are excellent for dating purposes.

Sets

In comparing the deposits from glass and china stores with those from domestic deposits, it becomes clear that they are different in a number of respects. The first, as mentioned throughout this report, is the distribution and frequency of wear patterns. The second is the overall pattern of sets in the feature assemblages, particularly with respect to table glass. In the glass and china store features, table glass is usually represented by only one example from a particular set or style. In some cases, such as two artifacts from feature 41, this is not always true. These two plain drawn-stem wine glasses represent what may be a set of two. Another example is a partially fragmented specimen, Cat. #5137.118, which may have been broken in transit or in the shop. When it was discarded, its counterpart, a perfect vessel (Cat. #5137.1), was probably thrown out with it or thrown out by mistake.

In contrast, some of the domestic assemblages show clear evidence of sets from the same time period or with the same vessel style. For example, Feature 30 contained two possible sets of drinking vessels. One was a set of four plain drawn-stem wine glasses with a conical solid foot. The other was a set of two Steigel-type, mold-blown (panelled) and wheel-engraved flip glasses. The same is also true for Feature 43, which contained several hexagonally cut and bridge-fluted wine glasses.

Social Status

Since most of the 175 Water Street deposits are commercial, the analysis of glass to determine status becomes problematical. In addition, no method similar to Miller's (1980) economic scaling model for ceramics exists for glass. However, from the archaeological inventory of the glass and china stores on the block, it appears that the merchants were trying to appeal to people of various economic backgrounds. This is evidenced by the large numbers of non-lead tumblers, both plain and engraved, in Lots 22 and 23. In the late-eighteenth to early-nineteenth centuries, this inexpensive glass was being produced in large quantities by Bohemian and American glasshouses.

Originally it was thought that comprehensive breakdown of table glass into lead and non-lead glass would be indicative of social or socio-economic status. This concept rested on the premise that most of the deposits were very late-eighteenth to early-nineteenth century, a time when high-quality lead glass may have been a status indicator. However, the 175 Water Street feature deposits were generally later, dating from a time when lead and non-lead glass did not reflect clear cut economic differences and, therefore, did not provide obvious criteria to use in hypothesizing about social status. And, as noted previously, the problem is further aggravated by the small number of primary domestic deposits compared with commercial or redeposited material recovered from the site.

Origins

As discussed in the methodology, the origin of certain glass vessels is problematical. That is, the origins will be skewed towards post 1825 materials due to the commonality of embossing. For glass manufactured prior to this date, origins were assigned when known (see Glass Table 4.4), but for the most part this was not possible for the utilitarian glass, even though most was probably of English or American origin.

An excellent example of origins and, therefore, of trade, comes from the fill in Lot 32. This represents a primary commercial deposit from the merchants that occupied the lot in the early-nineteenth century. These deposits were mixed within a redeposited eighteenth-century fill matrix. It is obvious from the deposits that the merchants who occupied this lot were engaged in extensive trade with France. From a 25 percent sample of the lot fill, 73 vessels, or 94.8 percent of the glass with attributable origins, came from France. These were primarily olive oil, olive, prunes, and wine bottles from Marseilles and Bordeaux.

Dating

Beginning date/End date. Several methods were used for dating the bottles and glass from the site. The first is related to the technological aspects of glass manufacturing that are datable (i.e., various pontils, mold types, and some finishes). For the most part, evidence of manufacturing techniques made it possible to establish a beginning and end manufacturing date for a given item or fragment. The second method entailed library research. By checking the New York City directories, a bracketed date range was established for several embossed bottles from the metropolitan area. Another method of dating was subjective and, as a result, utilized broader date ranges. In such cases, to cover the possible range of manufacture, a somewhat broader date range was provided than might actually have been necessary. The last method of dating was the concurrence of two forms of data: the lack of wear on glass vessels and the historically documented existence of glass and china stores. These stores were documented in Lots 22 and 23.

Computer Methodology. In addition to the identifying codes assigned to all analyzed material, to make the glass from the site more understandable and useful to other archaeologists, a large section on glass attributes was included on the computer tabulation sheets. On the computer printouts used in these analyses these columns fall between the date columns and the translation columns. The following is a description of these columns on order. The reader should refer to the "Finish Typology", this chapter. (See also Glass Table 4.2 for specific codes and descriptions.)

Minimum number of vessels (three columns). Feature glass from the site was laid out on tables in stratigraphic order; this made it possible to obtain a reliable MNV count, and also facilitated cross-mending. In addition, it made stratigraphic relationships much more visible. An MNV of one was given even though only 10 percent or less of a bottle was present. For example, the presence of a globular finish type (#26) usually associated with a "chestnut" bottle was enough to score it as an MNV of one. MNV was scored with either the finish or base, or where neither occurred, with the catalog number having the greatest number of body fragments.

Finish types (two columns). In order to make the report more understandable, a typology of bottle finishes was established during the analysis. Often a finish can be associated with a specific kind of bottle; for example, a case bottle has a distinctive finish (see Glass Table 4.2; #13, #61). In some instances, a particular finish can be found on bottles of varying function such as champagne, oil, or wine. In utilizing this typology it must be emphasized that the analysts lumped rather than split. For example, idiosyncratic variation in the application of the applied string-rim on a wine/liquor bottle did not give rise to 600 types of wine/liquor finishes. Instead these finishes were lumped into four main groups (see types 3, 4, 5, 6).

Lead/Non-lead (one column). To distinguish between leaded and non-lead glass, a Mineralight UVG-11 (short wave ultraviolet light) was used (McNaly 1979:18-19). Leaded glass exposed to this light turned ice-blue, non-lead glass did not. Lead glass was given the number 1 and non-leaded glass number 2.

Base (one column). The base characteristics of the bottles analyzed were divided into ten categories. Dating for both kinds of bare iron pontil (#3, #4), are taken from Munsey (1970:48). Dating for the snapcase (post 1857), was taken from Lorrain (1968:44), although there seem to be problems with this date: McKearin and Wilson (1978:14) cite Julian Toulouse as dating the snap case around 1850; they also date the use of the snapcase in France to the 1830s and slightly later in England. (The use of the snapcase in France during the 1830s through the early 1850s can be observed on a number of French wines and olive oil bottles from Lot 32). For descriptions of pontils #0, #1, #2, #5, see Olive Jones (1971). For descriptions of the machine cutoff scar (#8), see Munsey (1970:41), or Miller and Sullivan (1981:24). Number 6, the ground pontil scar, is usually found on tableware; it is a rough pontil that has been ground down and occasionally polished.

Color (one column). Due to the limited number of computer columns available, a description of glass color was restricted to ten categories. In most cases, color was lumped under a subheading. For example, light olive green was included under olive, sapphire blue under cobalt, and all shades of honey and amber under brown. This was also the case with Nailsea-like glass that occurred primarily in two colors but was lumped together as one. The Nailsea-like glass occurred in violet with white flecks, and dark olive green with white flecks.

Wear (one column). Bottle wear was broken down into several numbered categories; very heavy wear (#1) is characterized by a thick ring of wear on the bearing or bottom surface of the bottle. Heavy wear (#2) is indicated by a small but consistent ring of wear on the bearing surface. Slight wear (#3) is characterized by wear pattern marks or striations that are evident but did produce a fully developed ring or area of wear. No wear (#4) indicates the total absence of striations. Waterworn or rolled (#5) is a category denoting artifacts that were rolled in surf; often these were part of a ship's ballast. Wear category #6 is characterized by wear on the inside of a bottle. This particular kind of wear normally is indicative of, or associated with, fill deposits. For example, this wear pattern may be found on the top of

the kickup on the inside of the bottle. It may also be found on the inside shoulder fragments of a bottle. Wear category #7 essentially indicates no wear due to the exfoliation of patination (a chemical change) from the bearing surface (see Figure 4.1 for extent of wear [very heavy, heavy, slight, or none] on bottle and table glass from selected features).

Origin (two columns). Origin was assigned to bottles embossed with information citing specific cities such as London, Paris, or New York, or from specific regions, for example, Bordeaux. Whenever possible, style was also used as an indicator, particularly with French-style vessels. No origin was given to eighteenth-century English or American wine/liquor or case bottles. Early "onion" shaped wine/liquor bottles were believed to come either from England or Holland, and were assigned to a category including both countries.

A major problem with assigning origins to bottles from 175 Water Street relates to the fact that until the mid-nineteenth century embossing which, among other things, provided information about origin, was not a common practice. Without this information, classification as to origin becomes mainly subjective, and as a result, many vessels were not assigned origins. Gradually beginning in the early-nineteenth century, when the development and expanded popularity of embossed medicines and other types of bottles occurred, there appears to be a great influx of foreign glass into New York City. However, this is probably an illusion, the effect of a change in information rather than in actual trade practices. As a result, one cannot discuss a sudden increase in the glass trade in New York in the period 1825 to 1875 without recognizing the quality of the eighteenth century embossing data as opposed to that from the nineteenth century.

Mold markings (two columns). Free-blown (#1) refers to bottles blown without the use of a mold. Dipmolded (#20), or molded for body form, refers to bottles blown in a shoulder-height mold which were then removed and finished by hand. This category does not include pattern molds. Mold-blown (#3) refers to bottles or glassware that is hand blown in a mold. This usually encompasses fragmentary bottles of indeterminate mold type or tumblers. In the latter case, mold-blown distinguishes the tumbler from those that are pressed or free-blown. Pressed (#4) refers to pressed glass. For definitions, and illustrations of numbers 5, 6, 7, 8, 10, 11, see Toulouse (1969), Miller and Sullivan (1981), and Munsey (1970:38-45). Mold-blown and cut (#9) refers to a bottle or article of table glass that is blown in a mold, taken out, and later cut into decorative patterns. Information on pattern-molded and piece-molded patterns (#12, 16, 17, 18, 19, 21, 22, 24, 27, 28, 30, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42) can be found in McKearin and Wilson (1978:322-53). Free-blown and cut is a self-explanatory category (#13). Information and dating on turnmold bottles (#14) was taken from Munsey (1970:40). Mold type #15 indicates mold type unknown. Mold type #20 has the following characteristics: a mold mark diagonally across the base extending up to the neck, and two mold marks encircling the bottle, one at the heel and one at the shoulder. It appears to be from the late nineteenth century. Information on blown-threemold (#25) was taken from McKearin and Wilson (1978:352) and has been dated 1813-1840. Mold type #26, the "German" half-post method, is explained by McKearin and Wilson (1978: 328). Pressed, cut, and engraved (#29), and cut (#31), are self-explanatory. Information on

#32, the coil method, is somewhat scanty. This method only occurs on one specimen, a "worker's whimsey", and can be likened to the coil method in ceramics. Mold #23 is discussed in McKearin and Wilson (1978). This type consists of a bottle that is pattern molded, removed and swirled, and pattern molded a second time. In many cases it can be a "half post" method bottle.

Guidelines for Glass Analysis

1. For the purposes of analysis, bottles commonly known as carboys and demijohns have been separated into two types: the first (carboy) is a circular-sectioned container of varying volume, the finish being a "graduated", or large oil, finish. The second (demijohn) is a bladder-shaped vessel of varying volume. The finish is a sheared or wetted-off lip with a squared or sloppily-applied flattened string-rim. These bottles could be included within the commercial category since they functioned as bulk containers.

2. All "Turlington's Balsams" in clear lead glass were assumed to be English despite the fact that they may be counterfeits.

3. All vertically ribbed and diamond pattern glass was given a date range of 1790-1830.

4. Tumblers with ribs or decoration were assigned as types that were usually undecorated (i.e., codes KB14, KB15, KB16). The distinguishing factor is in the mold category. For example, a ribbed tumbler could be categorized as a KB14, or KB15 (plain undercoated tumblers or flips) but might have mold marks such as #37 (12 vertical ribs).

5. Vertically ribbed pocket flasks were dated 1790-1830, and Nailsea-type glass 1750-1850 (Jane Shadel Spillman 1982: personal communication).

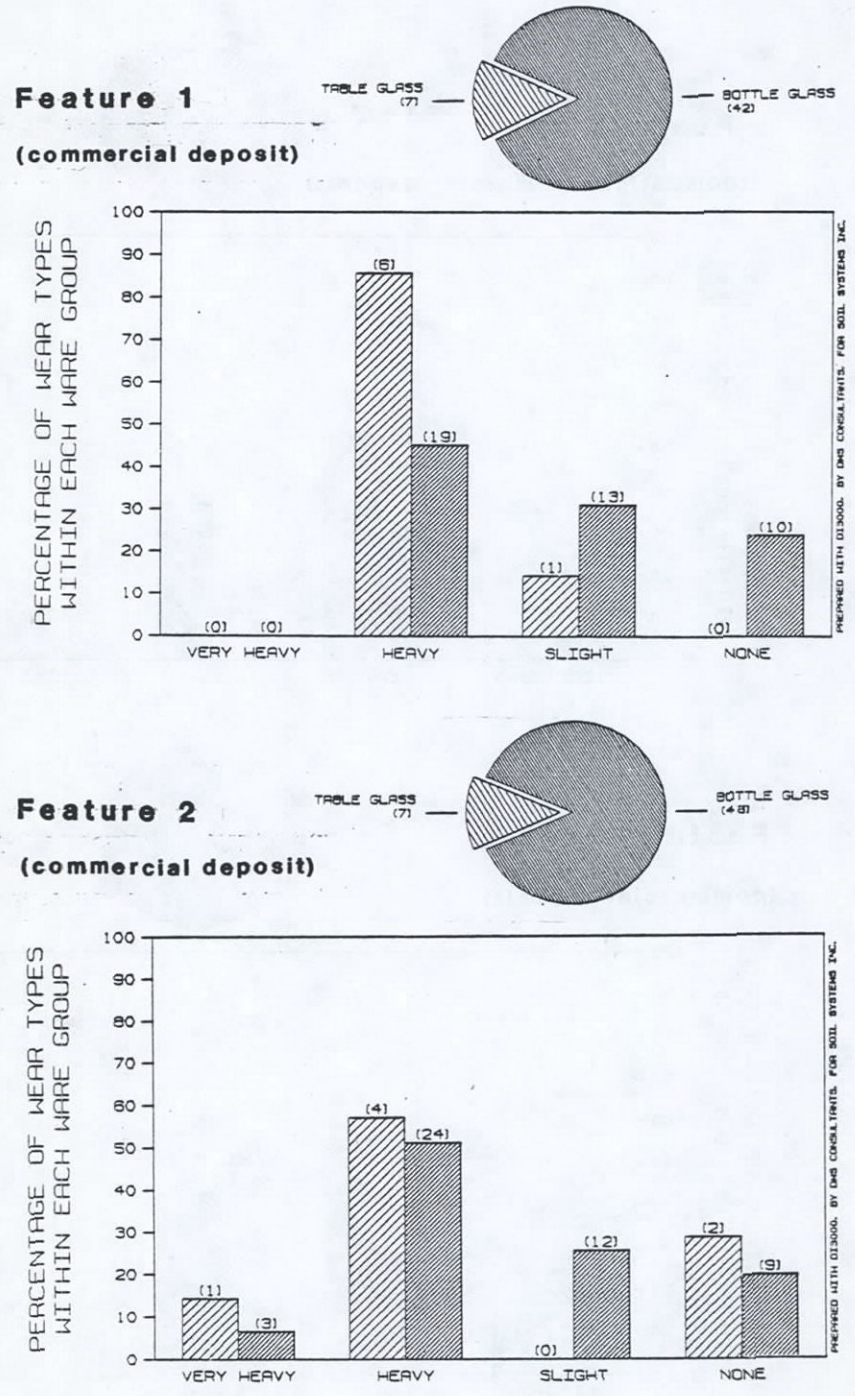
6. In addition to references cited in the text, a number of sources were consulted and used for dating and other purposes. These include the following: Baldwin (1973), Harris (1979), Jones (1982), McKearin (1970), Noel Hume (1961), Pepper (1971), Toulouse (1972), Warren (1970), and Lanmon (1969).

7. Although the term "Stiegel-type" is used throughout this report, it in no way implies association with the glassworks of Henry W. Stiegel. Instead, the term is used to bring to mind a number of familiar types that should be included under a more encompassing European style (Lanmon 1969; Jones 1982: personal communication).

Feature Analysis

In discussing some of the features from 175 Water Street, it must be made clear that some had analytical potential and others did not. For example, construction-related or architectural features will not be discussed here.

Figure 4.1 Glass
175 WATER STREET Extent of Wear by Ware



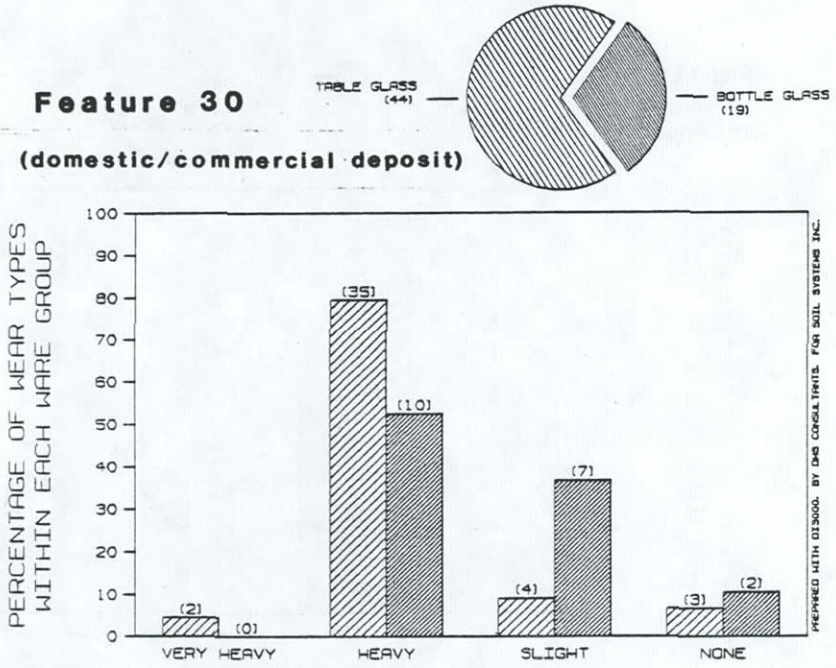
Key TABLE GLASS BOTTLE GLASS (N) MINIMUM NUMBER OF VESSELS

Figure 4.1
175 WATER STREET

Glass
Extent of Wear by Ware

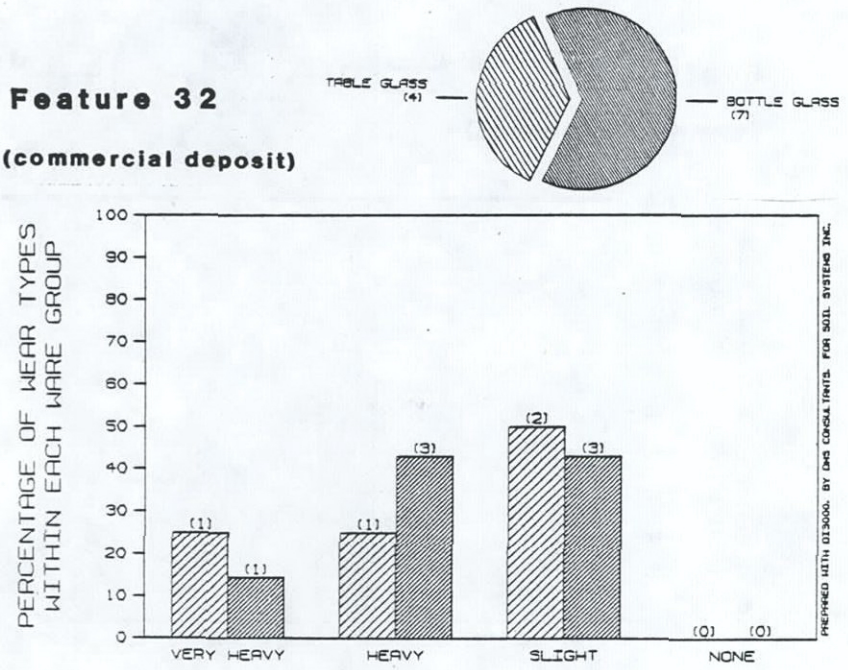
Feature 30

(domestic/commercial deposit)



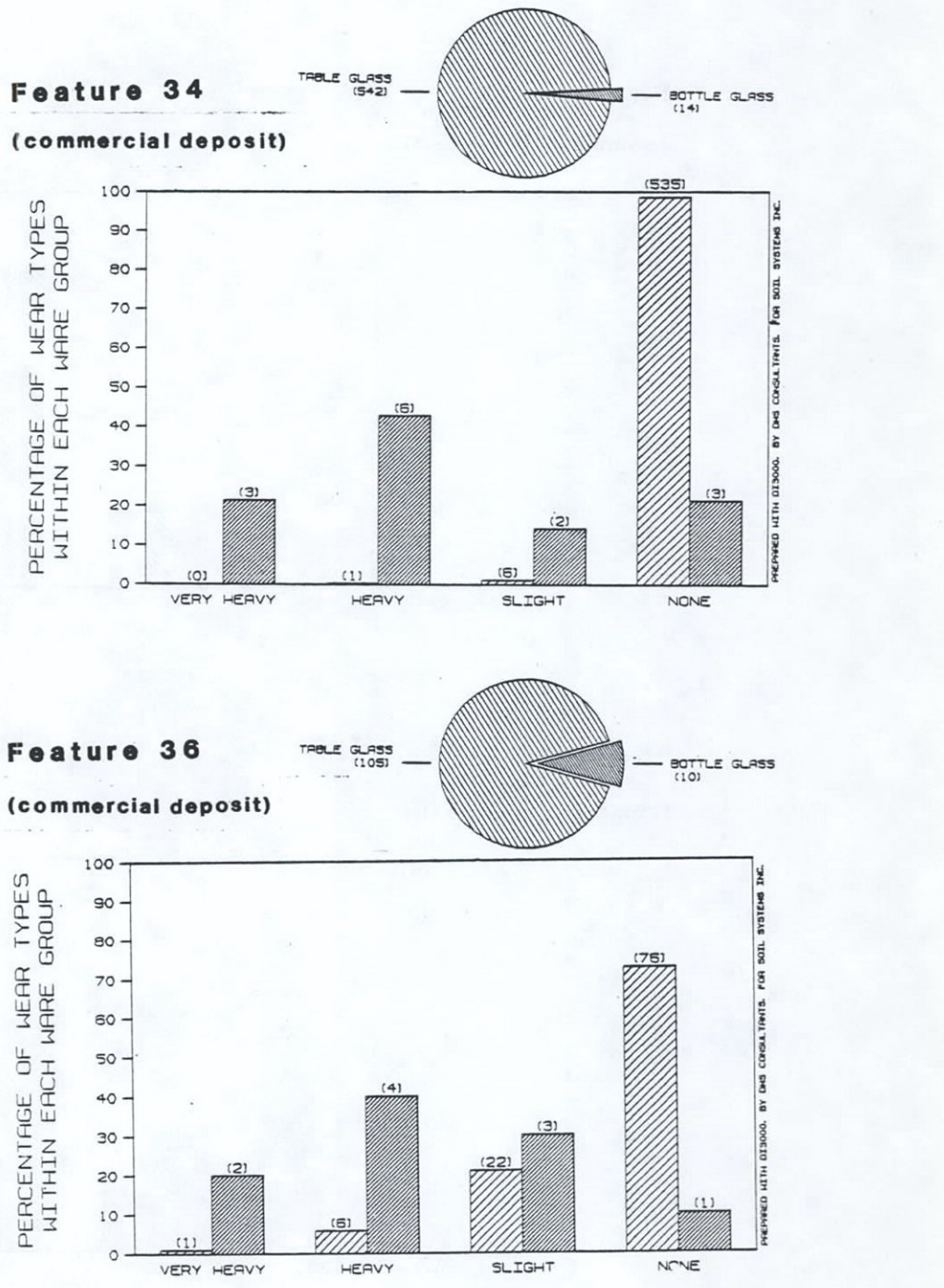
Feature 32

(commercial deposit)



Key TABLE GLASS BOTTLE GLASS (N) MINIMUM NUMBER OF VESSELS

Figure 4.1 Glass
175 WATER STREET Extent of Wear by Ware

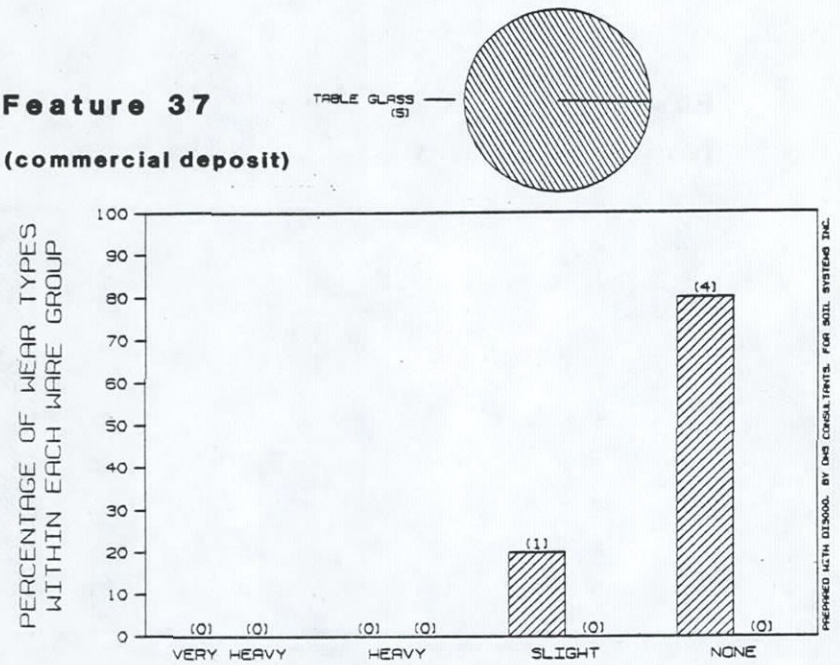


Key TABLE GLASS BOTTLE GLASS (N) MINIMUM NUMBER OF VESSELS

Figure 4.1 Glass
175 WATER STREET Extent of Wear by Ware

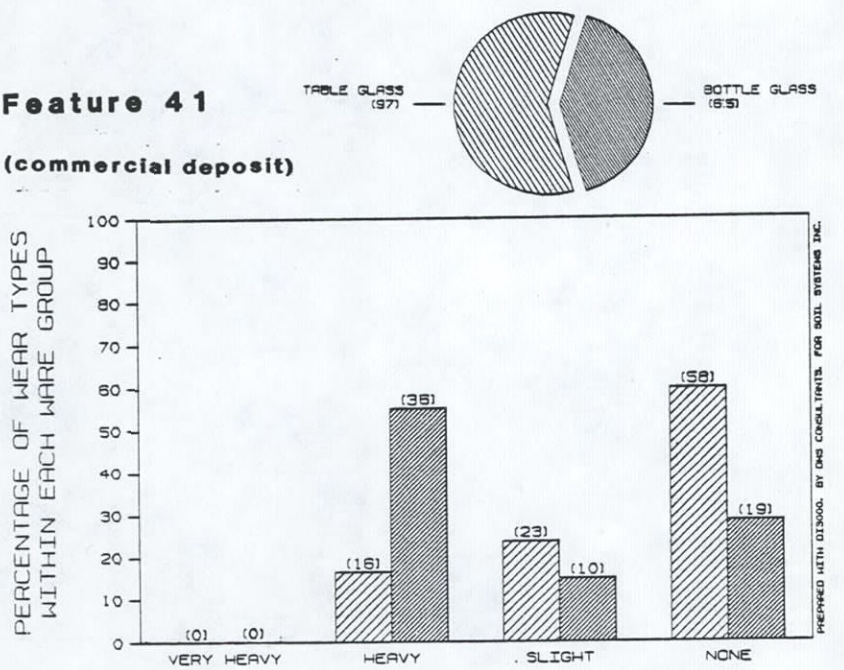
Feature 37

(commercial deposit)



Feature 41

(commercial deposit)



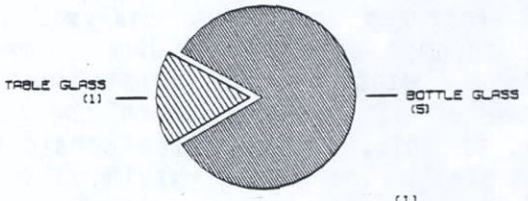
Key TABLE GLASS BOTTLE GLASS (N) MINIMUM NUMBER OF VESSELS

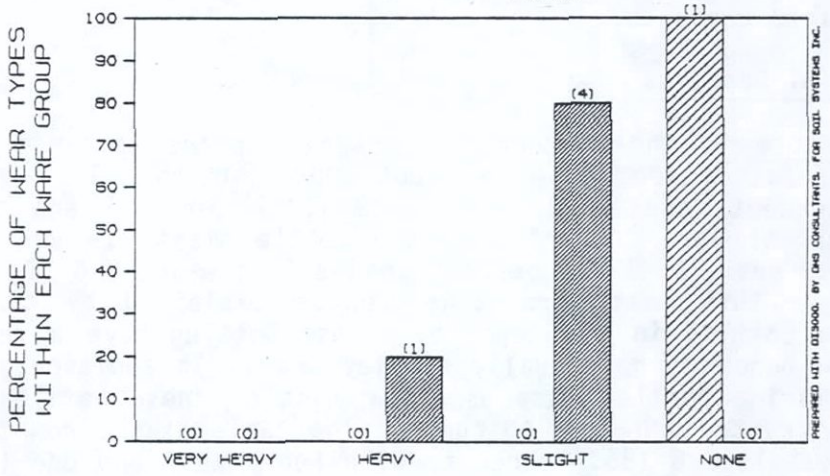
Figure 4.1
175 WATER STREET

Glass
Extent of Wear by Ware

Feature 47

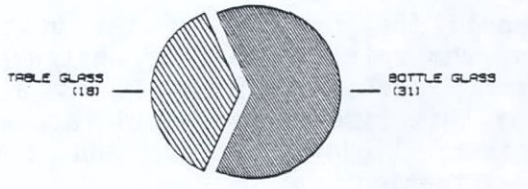
(domestic deposit)

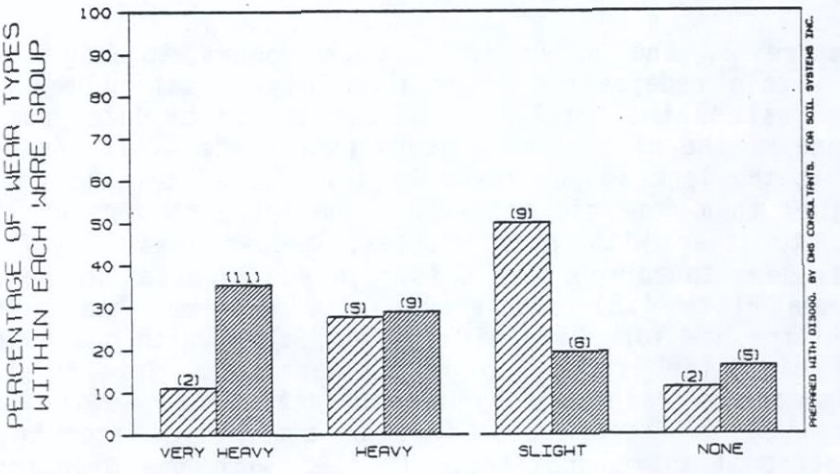




Feature 49

(domestic deposit)





Key TABLE GLASS BOTTLE GLASS (N) MINIMUM NUMBER OF VESSELS

Besides providing a terminus post quem, the small fragments of glass found within these features, or associated with them, offer nothing more than a description of the lot-fill writ small. Also, except in the case of privies, several features comprising redeposited material rather than primary deposits were bypassed. Since privy deposits are analyzed in detail by the faunal and ceramic analysts, they will also be discussed here. Where possible, features which were analyzed in detail will be discussed according to their assumed association with commercial or non-commercial occupations. As previously mentioned, the criterion used for this distinction is mainly the degree of use wear found on the bearing surface of the vessel. As a sidelight to this, one may also consider the relative percentages of bottle to table glass, the latter having the larger percentage in all glass and china store deposits.

Commercial Deposits

Feature 1, the cistern in Lot 36, appears to be a primary commercial deposit, dating from 1864 to about 1900. Of the glass by MNV, 124 vessels (80.0 percent) are bottle glass, 22 (14.2 percent) are table glass, and 9 (5.8 percent) are "other". Of the bottle glass, 19 vessels (44.2 percent) had heavy wear, 13 (30.2 percent) had slight wear, and 10 (23.3 percent), had no wear. This last percentage can be explained by the large number of medicine bottles in the deposit. These bottles have a relatively short use life and hence do not usually display wear. In addition, the common "green" or aquamarine bottle glass used for most of these bottles patinates easily, and wear patterns become obscured. The table glass from the feature numbers seven vessels: 6 (85.7 percent) with heavy wear and one (14.3 percent) with only slight wear (see Figure 4.1).

Although the function of the bottles appears to indicate a domestic situation, the relative lack of whiteware, except as small fragments in the fill matrix, reflects this. It is almost inconceivable that a domestic deposit of this time period would lack whiteware. Rather, the large numbers of medicines, liquor bottles, and tumbler fragments suggest a possible warehouse situation.

Feature 2, the privy in 33.05, appears to be a primary commercial deposit within redeposited material. This situation may be likened to Feature 1. Most of the bottles and glass appear to date from around the middle to the end of the nineteenth century (see Plate 4.7). As discussed above, it seems that the lack of whiteware in deposits of this period points to commercial rather than domestic activity. The large numbers of liquor and medicine bottles, together with food bottles, master inks, beer/stout bottles, and tumblers, seem to corroborate this. In addition, a "P. Gordon, 55 Vesey St., N.Y." (see Plate 4.8) bottle may also confirm this. Phillip Gordon was listed in the New York City directories, along with his father, Leonard, as a "cordial distiller" (see also dating section). Specifically, he was listed as a "lemon and raspberry syrup manufacturer". Lemon and raspberry syrup are/were used to flavor Weissbier, an extremely bitter beer (Greg Shaffrick 1982: personal communication). Coupled with the drinking habits of warehouse workers (then and now) and several beer/stout bottles from the deposit, this would seem to support a warehouse designation.

By MNV, 84 vessels (80.0 percent) were bottle glass, 16 (15.2 percent) were table glass, 5 vessels (4.8 percent) were from the "other" category. Of the bottle glass, 3 vessels (16.0 percent) had very heavy wear, 24 (50.0 percent) had heavy wear, 12 (24.0 percent) had slight wear and 9 vessels (19.0 percent) had none. Of the table glass, one vessel (14.3 percent) had very heavy wear, four (57.1 percent) had heavy wear, and two (28.6 percent) had no wear (see Figure 4.1).

The bottles appear to be predominately from the United States. Of 24, 18 vessels (75.0 percent) were from the United States, 2 (8.3 percent) were from France, 1 (4.2 percent) was from New York City, 1 (4.2 percent) was from Philadelphia, 1 (4.2 percent) was from Bordeaux, and 1 (4.2 percent) was from the Northeastern United States.

For the dates assigned to this feature, see section on feature dating and function based on glass and ceramics.

Feature 32, the stone privy in 23.05 is apparently a primary commercial deposit from the mid-nineteenth century within a redeposited fill matrix from the late-eighteenth century. Functionally, the percentages of various glass categories reveal little except the matrix composition of the deposit. However, some of the whole or partially whole mendable artifacts are more telling (see Figure 4.1 for wear patterns by bottle and tableware categories). Several wine and wine/liquor bottles, in addition to a snuff bottle and drinking glass, point to "male" related or commercial activities. Here, "commercial" refers to the refuse discarded by warehouse or store employees not the large numbers of specific types of artifacts one would expect at a glass and china store. The origins of the glass in this feature could only be assigned to two vessels, one from the United States, the other from the Dyottville glassworks in Philadelphia.

Feature 34, the "pit" in Lot 23, also appears to be a commercial deposit and post-dates 1795 from the ceramic evidence. However, it is possible that this feature relates to the glass and china store of 1809, as does Feature 36. In this case, the feature post-dates 1795 based on the ceramic evidence, but is probably approximately 1809 based on the historical documentation in conjunction with wear pattern analysis. The vessel types by MNV in this feature were 23 vessels (4.0 percent) of bottle glass, 550 (95.5 percent) of table glass, and 3 (0.5 percent) of the "other" category. In the bottle glass category, 3 vessels (18.8 percent) had very heavy wear, 6 (37.5 percent) had heavy wear, 2 (12.5 percent) had slight wear, and 3 (18.8 percent) had none (see Figure 4.1).

The bottle glass from this feature, like that from Feature 41, contains fragments of vertically ribbed pocket flasks similar to those found in McKearin and Wilson (1978:366-367, Plate 100, #3, 4).

The table glass from the pit included 1 vessel (0.2 percent) with heavy wear, 6 (1.1 percent) with slight wear, and 535 (98.7 percent) with no wear. The table glass from this feature, all of which was lead glass, consisted of tumblers similar to those found in Feature 37, a barrel (see Figure 4.1).

The total glass assemblage from this feature numbered 28,084, with the majority being fragments of lead glass tumblers.

Feature 36, the box in the southwest corner of Lot 23, is probably a commercial feature that dates to approximately 1809; at least so it appears from the available glass evidence. Of 131 glass vessels from the box, 16 (12.2 percent) were bottle glass and 115 (87.8 percent) were table glass. Within the bottle glass category, 2 vessels (20.0 percent) had very heavy wear, 4 vessels (40.0 percent) had heavy wear, 3 vessels (30.0 percent) had slight wear, and 1 vessel (10.0 percent) had no wear (see Figure 4.1). As in Feature 41, the heavy to very heavy wear patterns found on the bottle glass may relate to reuse or a domestic situation of low archaeological visibility. The bottle glass from the feature consists of wine bottles, medicine vials of "green glass", and a snuff (or mustard) bottle.

The table glass from the feature (87.8 percent) comprised 1 vessel (1.0 percent) with very heavy wear, 6 (5.7 percent) with heavy wear, 22 (21.0 percent) with slight wear, and 76 (72.4 percent) with no wear (see Figure 4.1). It is interesting to note that of 87 non-lead glass vessels (mostly tumblers), 86 had slight or no wear.

Specific examples of glass from this feature included several Stiegel-type mold-blown and wheel-engraved tumblers or flips, a vertically ribbed tumbler, a mold-blown decanter with a band of ribbing near the base, and an extremely large number of plain non-lead tumblers (see Plate 4.5). The origin of the bottles is, in most cases, unattributable. However, one "chestnut" bottle can be reasonably assumed to be of United States origin.

Feature 37, the barrel in Lot 23 is probably a commercial deposit and, as mentioned in the dating section, post-dates 1795. It also may relate to the glass and china store on the lot in 1809. This interpretation is based on five vessels of table glass; of four non-lead examples, none displayed wear. One lead glass specimen had slight wear (see Figure 4.1). Excavation also uncovered an oily organic material which may have been the straw originally used to pack the glass.

Feature 41, the privy in Lot 22, probably represents a commercial deposit which dates from approximately 1795-1826. As discussed in the dating section, neither glass nor ceramic analyses can determine which of four historically-documented stores this deposit represents. However, the inventory can be discussed.

By MNV count (this excludes window glass), 59 percent, or 141 vessels, were from the table glass category; 37.2 percent or 89 vessels were from the bottle glass category, and 3.8 percent, or 9 vessels, were from the "other" category. Of the bottle glass, 36 vessels, or 55.4 percent, had heavy basal wear and the remaining 29 vessels (44.6 percent) had slight or no basal wear (see Figure 4.1). The 55.4 percent may represent either the resale of used bottles, particularly wine/liquor bottles, or a possible domestic situation, such as refuse from a residence located above the china and glass store.

The bottle glass with slight or no wear is probably from the store's inventory. Specific examples of these are several pocket flasks similar to those identified in McKearin and Wilson (1978:366-367, Plate 100, #1, 3, 4). (See also Plate 4.1).

The table glass (59 percent of the assemblage by MNV) was characterized by 16 vessels (16.3 percent of the table glass) having heavy wear, 23 vessels (23.5 percent) having slight wear, and 58 vessels (59.2 percent), having no wear. The high percentage of vessels with slight (possibly shelf wear) or no wear (82.7 percent combined) probably is representative of the inventory of a glass store. This also points directly to the clientele of the late-eighteenth to early-nineteenth-century glass and china shop. From the available evidence, it seems that the glass and china store represented here may have tried to appeal to people of various socio-economic backgrounds.

Specific examples of table glass include a cut leaded-glass cruet, several pattern-molded salt cellars, both in clear and cobalt, several Stiegel-type mold-blown and wheel-engraved flip glasses and tumblers, mostly of non-lead glass. Several plain drawn stem, hexagonally cut, and bridge-fluted wine glasses, and a milkglass mug or tankard with stenciled design and cobalt blue trailed rim (see Plate 4.2).

The origins attributed to the glass in this feature were few, with only four identified: 1 vessel (25 percent) from the United States, 1 vessel (25 percent) from France, 1 vessel (25 percent) from London, and 1 vessel (25 percent) from England/Holland. The last is an "onion" bottle and is only represented by small fragments from the landfill at the bottom of the feature.

Domestic Deposits

Feature 30, the box in 32.02, by the definition used here, is a domestic feature and dates from 1795-1820. Based on total MNV, 64 vessels (49.2 percent) were of bottle glass, 56 (43.1 percent) were table glass, and 10 (7.7 percent) were from the "other" category. The last is composed almost entirely of proof vials. The "other" category, in this case, could be quite informative in determining the nature of the deposit. Although identification of feature types has been based primarily on percentages of various glass categories in combination with wear pattern analysis, additional evidence cannot be disregarded. Watkins notes that a proof vial was "a wine tester for sampling wine from the barrel. The thick base gave it enough weight so that it would sink when empty, and it was slender enough to be lowered through the bung-hole" (1930:64). It is quite possible that since the majority of the glass in the feature centers around alcohol consumption it may, based on wear pattern, be domestic, or based on behavior, be commercial. For feature glass see Plate 4.6

Of the bottle glass, 10 vessels (52.6 percent) had heavy wear, 7 (36.8 percent) had slight wear, and 2 (10.5 percent) had no wear (see Figure 4.1). The bottle glass was composed of wine bottles, a utilitarian bottle similar to McKearin and McKearin (1978:Plate 228, #13), but with a flared finish.

The table glass included plain drawn stem wine glasses, Stiegel-type mold-blown and wheel-engraved flips, and plain tumblers and flips. The "other" category included several proof vials, all of lead glass. Of the table glass, 2 vessels (4.5 percent) had very heavy wear, 35 (79.5 percent) had heavy wear, 4 (9.1 percent) had slight wear, and 3 (6.8 percent) had no wear (see Figure 4.1).

From those that could be classified by origin, 5 vessels (38.5 percent) were from England and 7 (53.8 percent) were American.

Feature 43, the large privy in Lot 21 appears to be a domestic deposit sandwiched between levels of landfill and a redeposited fill matrix. This complicated identification was further aggravated by a mis-assigned catalog number from the main commercial deposit that was classified as non-feature. The results are somewhat sketchy and should be viewed with caution.

By MNV count, 11 vessels (37.9 percent) were bottle glass, 15 (51.7 percent) were table glass, and 2 (6.9 percent) were from the "other" category.

Of the bottle glass in the feature, 1 vessel (20 percent) had very heavy wear, 1 vessel (20 percent) had slight wear, and 3 (60 percent) had indeterminate wear due to exfoliation of patination.

Of the table glass, 3 vessels (50 percent) had heavy wear and 3 (50 percent) had slight wear. No origins could be assigned to glass from this feature.

Specific examples of glass from the domestic deposit include an eight-sided snuff bottle, several bridge-fluted wine glasses, several cut water glasses, fragments of a specimen jar, a plain drawn-stem wine glass, a salt cellar, and a glass microscope slide.

Feature 47, the privy in 20.05, is apparently a primary domestic deposit (circa 1867) within a matrix of redeposited material composed primarily of eighteenth-century ceramics. The glass from this feature comprises 9 vessels (75.0 percent) of bottle glass, and 3 (25.0 percent) of table glass. The bottle glass was composed of a hock wine, two cathedral pickle bottles, and two "C.H.Ring, New York", patent or proprietary medicine bottles. The table glass included a "crystal wine" glass and a paneled tumbler. The wear analysis of the bottle glass indicated 1 vessel (20.0 percent) with heavy wear and 4 (80.0 percent) with slight wear. One table glass artifact (100 percent) showed no wear (see Figure 4.1). Most, if not all, of the glass in this feature appears to be of American origin.

Feature 49, the box in 20.05/.06, is a domestic feature and probably dates from 1795-1820. By MNV, the bottle glass is represented by 35 vessels (56.5 percent), table glass by 25 (40.3 percent), and the "other" category by 2 (3.2 percent). Of the bottle glass, the wear pattern is broken down into 11 vessels (35.5 percent) with very heavy wear, 9 (29.0 percent) with heavy wear, 6 (19.4 percent) with slight wear, and 5 (16.1 percent) with none (see Figure 4.1). The bottle glass from the feature (see Plate 4.3) was composed of wine bottles, vials, medicine bottles, a flacon, and a large aquamarine French bottle similar to those from the Fort Michilmackinac (Brown 1971) and Tunica Treasure (Brain 1974:92) reports. There was also an "Essence of Peppermint" bottle and a pink toilet bottle, vertically-ribbed, that shows similarities to midwestern swirled glass.

The 18 vessels that represented the table glass comprised 2 vessels (11.1 percent) with very heavy wear, 5 (27.8 percent) with heavy wear, 9 (50.0 percent) with slight wear, and 2 (11.1 percent) with no wear (Figure 4.1). The table glass was characterized by drawn stem wine glasses, a vertically-ribbed barrel-shaped glass and an inkstand of leaded glass (see Plate 4.4).

The origins of the glass in this feature were as follows: England 11.1 percent, the United States 33.3 percent, and France 44.4 percent.

Feature 50, the privy in Lot 19, is a primary domestic deposit within an older redeposited fill. The glass from this feature appears to be primarily from the redeposited matrix. Classification as a domestic deposit relies on the ceramic interpretation based on the number of whole, partially whole, or mendable vessels. This situation is not the same for glass, however, most of which is extremely fragmentary and unmendable. Because of its fragmentary condition, neither wear patterns nor origins were determined for this material.

Feature 51, the privy in Lot 18, is a primary domestic deposit in conjunction with redeposited material. As in Feature 43, the results are somewhat sketchy and may be skewed in favor of the attributes of the redeposited glass. A degree of caution, therefore, is warranted.

The glass from the feature consisted of 12 vessels (48 percent) of bottle glass, 10 (40 percent) of table glass, and 3 (12 percent) of "other" glass.

Of the bottle glass, 2 vessels (100 percent) displayed heavy wear. The rest either had no bases or were assigned as having no wear due to exfoliation of patination. Similarly, the one table glass vessel displaying wear indicated heavy use. Again, no origins could be assigned to glass from this deposit.

FEATURES WITH A REDEPOSITED FILL MATRIX ("OTHER")

Feature 42, the small privy in Lot 21, is a late-eighteenth to early-nineteenth-century fill matrix deposited in the feature from 1857 to about 1865. For more information see the dating section.

Feature 44, the round privy in Lot 21, is redeposited material. This feature offered little information.

Feature 48, the privy in Lot 20, is redeposited material. For more information see the dating section.

Non-Feature Glass

As noted in the laboratory section of this chapter, the landfill or non-feature material from the site was not the subject of detailed artifact analysis. The tabulation of these data was completed with the assistance of Valerie DeCarlo and Mallory Gordon.

As would be expected, the landfill and yard fill provided examples of most of the common glass vessels produced in the late-eighteenth to early-nineteenth centuries. Since this material was not analyzed in depth, the only lot fill that provided obvious examples of trade came from Lot 32. This fill provided a clear example both of merchant activity and trade with France, the major source of goods (see section on Origins). Identifiable items from other lots were a Turlington's Balsam (#660.0, Lot 33), an "R.G.L. 1756" seal (#603, Lot 33), a wine bottle dating from about 1750-60 (5182.1, Lot 19), and a possible French wine bottle from Lot 19 (#5063.1).

Summary

The glass assemblage from the 175 Water Street excavations consisted of 119,729 glass fragments, approximately 72,000 of which were from features (this feature number does not include deeptests). The glass data included a full range of bottle and glass variation from the second half of the eighteenth century until the middle of the nineteenth century.

In some cases, the glass provided extensive information; in others, it yielded very little. For example, the glass did provide some evidence of trade. However, to say that trade occurred is stating the obvious. What is really lacking is a definite statement about the variation and change in trading frequencies by country or city through time. Since many of the unmarked bottles could not be assigned origins, these data are inconclusive. In addition, as previously discussed, we are not in a position to postulate on social or socio-economic status based on the glass.

What can be discussed, however, is the quantity of data available concerning the commercial establishments on the block. The glass from these deposits, particularly Features 36, 41, and 34, provided an inventory of the contents of a glass and china store from the late-eighteenth to early-nineteenth centuries, a form of data that has been quite scarce. In addition, the overall view of the features from the site provides several examples of deposit types and the activities they represent. Of primary importance, the analysis distinguished between domestic and commercial deposits. And, finally, it was possible to identify various behavioral elements within the commercial category.

As discussed above, the most archaeologically and historically visible example is a deposit from a glass and china store. More subtle, perhaps, is the fact that another commercial activity responsible for some of the 175 Water Street features, that of the middle to late-nineteenth-century warehouses, may be differentiated. The feature assemblage from this kind of deposit is characterized by large numbers of medicine bottles, liquor bottles, tumblers or glasses for dispensing beverages, food bottles, master ink bottles, beer bottles, and sometimes mineral water or soda bottles. Also characteristic is the total lack of whiteware in the ceramic assemblage, a ceramic typically found in domestic deposits from the same time period; this is a major distinguishing factor between domestic and warehouse/commercial deposits post-dating 1820.

Glass analysis makes it apparent that the 175 Water Street site is primarily a commercial block. This is evidenced by the quantity of both glass and china in several deposits indicating early "stores" and what appears to be evidence for later warehouse/commercial activity. Within the warehouse/commercial category it is extremely difficult to determine what type of warehouse is represented. More than likely, this is because goods were coming in fully crated and normally were not opened until they reached the shop or merchant ordering them; one example of this is found in Feature 37, the barrel in Lot 23. This barrel contained several broken glasses in addition to an oily organic substance that may have been the remains of straw packing.

The domestic activity at the site was apparent in features such as 49, 30, 47, 43, 50, and 51. These features appeared domestic rather than commercial based on the evidence of heavy wear on the glass. However, there is the possibility of a commercial component such as the china and glass store, combined with a domestic deposit that is not as obvious. If they can be separated, these deposits should or could perhaps represent a commercial establishment on the ground floor with domestic, albeit low income, housing above. These deposits appear quite subtle and have been previously referred to as possible domestic deposits of low archaeological visibility. Cluster analysis might be effective in separating and clarifying these deposits.

On the 175 Water Street block, deposits of a primary nature, that is, not redeposited material, appear mainly to post-date 1795, with some as late as 1870. In many cases, the earlier occupation features indicate that even commercial deposits may have domestic components while those dating from the middle to late-nineteenth century suggest only warehouse/commercial activities.

The glass assemblage from the 175 Water Street site, although not yielding detailed information about trade or status, did provide a variety of archaeological deposits representing various kinds of human behavior. It was particularly useful in distinguishing between commercial and domestic deposits and suggested commercial activities. Although many problems have been analyzed successfully, there are many facets of the archaeological record that have not been dealt with here. To address these potential analyses, a rich data base has been provided for future researchers.

GLASS TABLE 4.1 175 WATER STREET: Function (KA, KB, KC, KD) Partially Illustrated

Bottle Glass (KA) (numbers refer to computer code)

01. Master Ink
02. Inkwell or Inkstand
03. Mucilage
04. Drug
05. Proprietary Medicine/Drug
06. Proprietary Medicine
07. Vial (medicine)
08. Wine (bottle)
09. Liquor (bottle), includes chestnut
10. Wine/liquor (bottle)
11. Wine (flask), personal
12. Liquor (flask), personal
13. Wine/liquor (flask), personal (pocket flasks)
14. Champagne
15. Brandy
16. Soda
17. Mineral water
18. Soda/mineral water
19. Beer
20. Ale/stout
21. Porter
22. Beer, porter, ale, stout
23. Chemical
24. Bitters
25. Snuff
26. Fruit jar/preserves
27. Poison
28. Scent
29. Perfume
30. Cologne
31. Perfume/cologne
32. Drugstore/apothecary bottles and jars
33. Carboy
34. Demijohn
35. Bulk bottle (carboy, demijohn)
36. Toilet bottle
37. Food (general)
38. Prunes
39. Pickle
40. Olive oil
41. Olive
42. Mustard
43. Extract (genuine)
44. Workers whimsey
45. Case bottle
46. Liquor/handled flask

GLASS TABLE 4.1 (continued)

Bottle Glass (KA)

47. Bluing
48. Food "flacon"
49. Olive oil w/seal
50. Wine w/seal
51. Prune w/seal
52. Screw top lid without milkglass on inside
53. Bleach
54. Species jar
55. Vinegar
56. Cigar tube
57. Ink cartridge (glass)
58. Figured flasks (liquor)
59. Cold creme

99. Unidentified bottle glass

GLASS TABLE 4.1 (continued)

Table Glass (KB), Illustrated (numbers refer to illustrations)

1. Stemmed wine glass.
Molded pedestal stem (Silesian stem). Six-sided, rounded shoulders with tear inside. Although Haynes (1970:217) dates this stem circa 1715-1765 and Davis (1964:33-34) dates it 1715 mid-eighteenth century, I have used Noel Hume's (1968:28-29) date of 1715-1730. Cat. #5033.2.

2. "Rummer" (Noel Hume 1978:195).
The knop is variously described as "bladed" (Haynes 1970:202) and "angular" (Davis 1964:31). Dated according to Noel Hume (1978:195) as circa 1780-1830. Cat. #383.111.

3. Stemmed wine glass.
Plain drawn stem. Most have conical normal, conical solid, or folded foot. Most, if not all, have solid iron bar pontils. Similar to those produced at Amelung circa 1784-1795 (Noel Hume 1974b:116-119). I have used Noel Hume's (1978:190-191) date of 1780-1805 to date this type. Cat. #417.1, 5131.9, 5137.118.

4. Stemmed wine glass.
Hexagonally cut diamond faceted stem. Although Noel Hume (1978:190-193) and Davis (1964:25) date this type circa 1760-1770 and 1770-1800 respectively, I have used Haynes' (1970:284-289) date. His date of 1760-1810 is broader and may more fully represent the range of use and manufacture. Cat. #8047.2.

5. Stemmed wine glass.
Hexagonally cut faceted stem with bridge fluting. Although Noel Hume (1978:190-193) and Davis (1964:25) date this stem type circa 1760-1770 and 1770-1780 respectively, I have used Haynes' (1970:284-289) date of 1760-1810. Cat. #5137.149.

6. Stemmed wine glass.
Plain drawn stem (thick). Similar to type 3. Cat. #5205.

7. Stemmed wine glass.
Air twist stem. Although Noel Hume (1978:190-193) and Davis (1964:25) date this type circa 1745-1765 and 1740-1755 respectively, I have used Haynes' (1970:254-261) date of circa 1745-1770 for this type. Cat. #5021.1.

8. Stemmed wine glass.
Solid stem with tears. I have used Noel Hume's (1978:190-192) date of circa 1725-1760 for this type. Cat. #639.4.

9. Stemmed wine glass.
Incised twist stem. Honeycomb at base, hollow stem with vertical fluting. Crizzled glass. Cat. #5208.9, 5213.14.

10. Stemmed wine(?) glass.
Six-sided. Pressed. Lead glass. Cat. #434.1.

GLASS TABLE 4.1 (continued)

Table Glass (KB), Illustrated

11. Stiegel-type flip glass.
Mold blown (panelled) with wheel engraved design. (Most, if not all, are blown from non-lead glass). Similar to McKearin and McKearin (1941) Plate 22, Number 3. Cat. #410.1.

12. Waterglass (?) or tumbler.
Cut. Number of sides varies. Cat. #5169.20.

13. Tumbler.
Pattern molded. Number of ribs varies. Cat. #5137.125.

14. Tumbler/Flip.
Arbitrarily based on basal diameter. Larger than 2 6/16 inches. Cat. #410.30.

15. Tumbler.
Arbitrarily based on basal diameter from 1 6/16 inches to 2 6/16 inches. Cat. #410.13.

16. Double shot or shot glass.
Arbitrarily based on basal diameter less than 1 6/16 inches. Cat. #5169.8.

17. Tumbler.
Ten-sided. Gothic style. Mold-blown and cut. Lead glass. Ground and polished pontil scar. Cat. #381.49.

18. Tumbler.
Eight-sided. Pressed. Similar to M'Kee and Brothers (1981:59) tumbler from the 1864 catalog.

19. Tumbler.
Nine-sided. Pressed. Ground pontil. Similar to M'Kee and Brothers (1981:19) bar tumbler from 1859 to 1860.

20. Fragments of unidentifiable panelled or fluted tumbler.
May be pressed or mold-blown.

21. Tumbler.
Eight-sided. Mold-blown. Ground pontil. Cat. #420.1.

22. Tumbler.
Panelled or ribbed with Stiegel-type enamel decoration. Cat. #420.17.

23. Tumbler.
Six-sided. Mold-blown. Large ground pontil. Similar to M'Kee and Brothers (1981:19) pint tumbler from the 1859-1860 catalog.

24. Unidentifiable undecorated stemmed wine glass fragments.

GLASS TABLE 4.1 (continued)

Table Glass (KB), Illustrated

25. Unidentifiable undecorated tumbler fragments (not panelled).

26. Tumbler. Horizontal striations. Cat. #566.1

27. Unidentifiable decorated tumbler fragments. Wheel engraved.

28. Decanter.

29. Stopper. May be from decanter or cruet, hollow or solid.

30. Unidentifiable wheel engraved fragments. May be wine glass or tumbler.

31. Water glass (?) or possibly tumbler. Cat. #210.6

32. Rigaree. Broken off and separate from table glass.

33. Squat tumbler. Cat. #636.1

34. Wine glass "Crystal wine". Pressed glass. This shape is in all McKee and Brothers catalogs from 1859/60 to 1871 (1981). Cat. #5287.7.

35. Unidentifiable undecorated wine/tumbler/flip glass fragments.

36. Tumbler. Not mold-blown. Stiegel-type enamel decoration.

37. Stemmed wine glass. Enamel twist. Dated according to Haynes (1970:207) as circa 1755-1780.

38. Stemmed wine glass. Enamel twist. Dated according to Haynes (1970:207) a s circa 1755-1780.

39. Glass plate.

40. Stemmed wine glass fragments, wheel engraved.

41. Salt cellar. Eight rows of horizontal diamonds. Lead glass. Soild iron bar pontil. Cat. # 5137.163.

42. Tumbler. Diamond pattern. Pattern molded. Cat. # 5073.1

43. Tumbler. Panelled with wheel engraved decoration.

44. Handle or handle fragment.

45. "Firing glass". Dated according to Haynes (1970:245) as circa 1740-1775. Cat. #5063.2

46. Glass. Barrel shaped. Sixteen vertical ribs. Cat. #5340.480.

47. Cruet

GLASS TABLE 4.1 (continued)

Table Glass (KB), Illustrated

48. Candy dish.

49. Tumbler. Pattern molded. Panelled base with diamond pattern to rim. Cat. #609.1559.

50. Flip. Stiegel-type wheel engraved decoration. Cat. #609.1499.

51. Flip. Stiegel-type wheel engraved decoration. Cat. #609.1573.

52. Flip. Stiegel-type wheel engraved decoration. Cat. #609.1531

53. Flip. Stiegel-type wheel engraved decoration. Cat. #609.1589.

54. Flip. Stiegel-type wheel engraved decoration. Similar to Hunter's (1950) examples #130 and #131.

55. Tumbler. Wheel engraved decoration as shown. Cat. #8023.85.

56. Stemmed wine glass. Color twist. Dated according to Haynes (1970:207) as circa 1755-1775. Cat. #5324.1.

57. Stemmed wine glass. Straight stem with knop near base. Cat. #409.7

58. Mug or tankard.

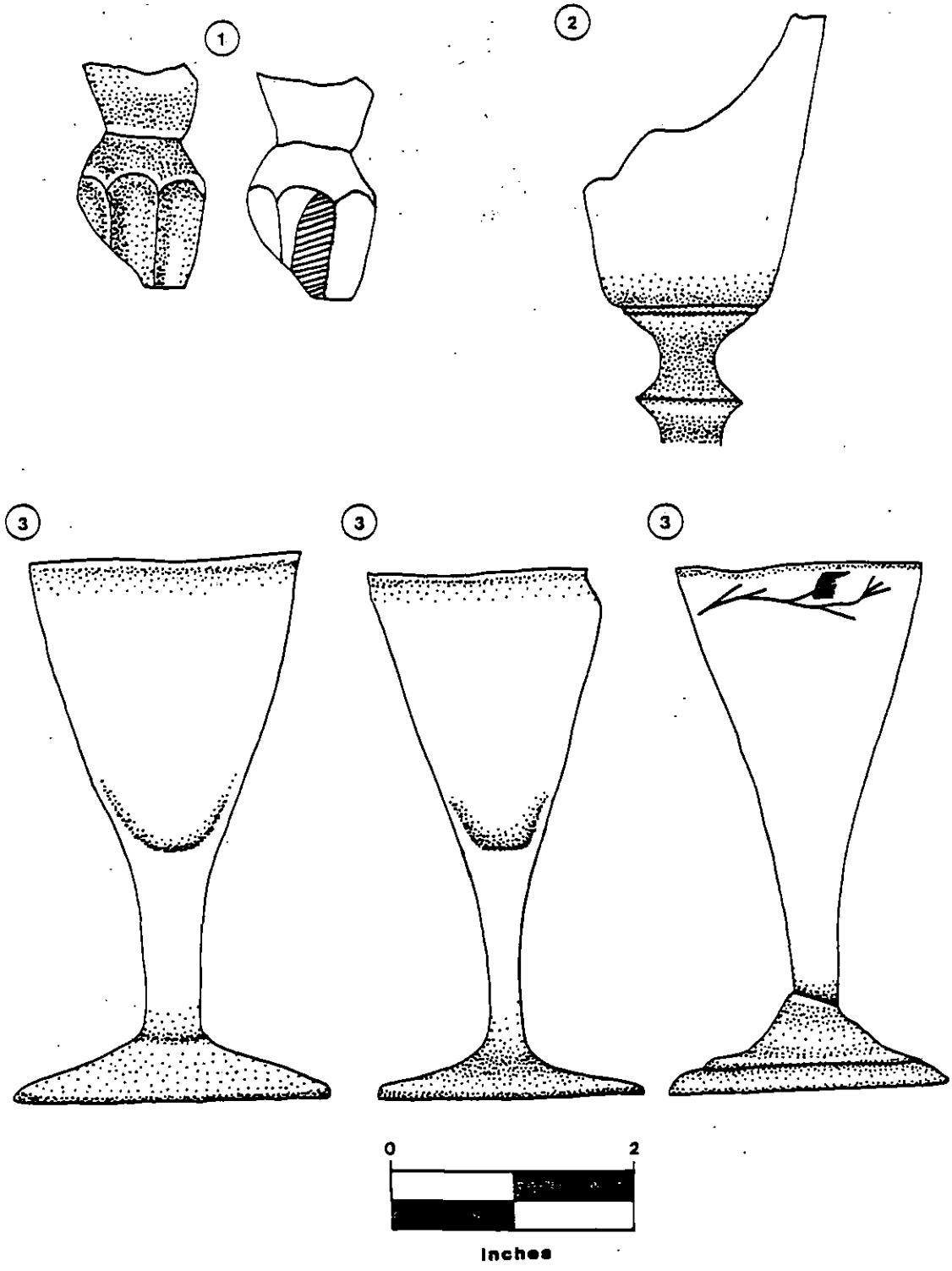
59. Finger bowl.

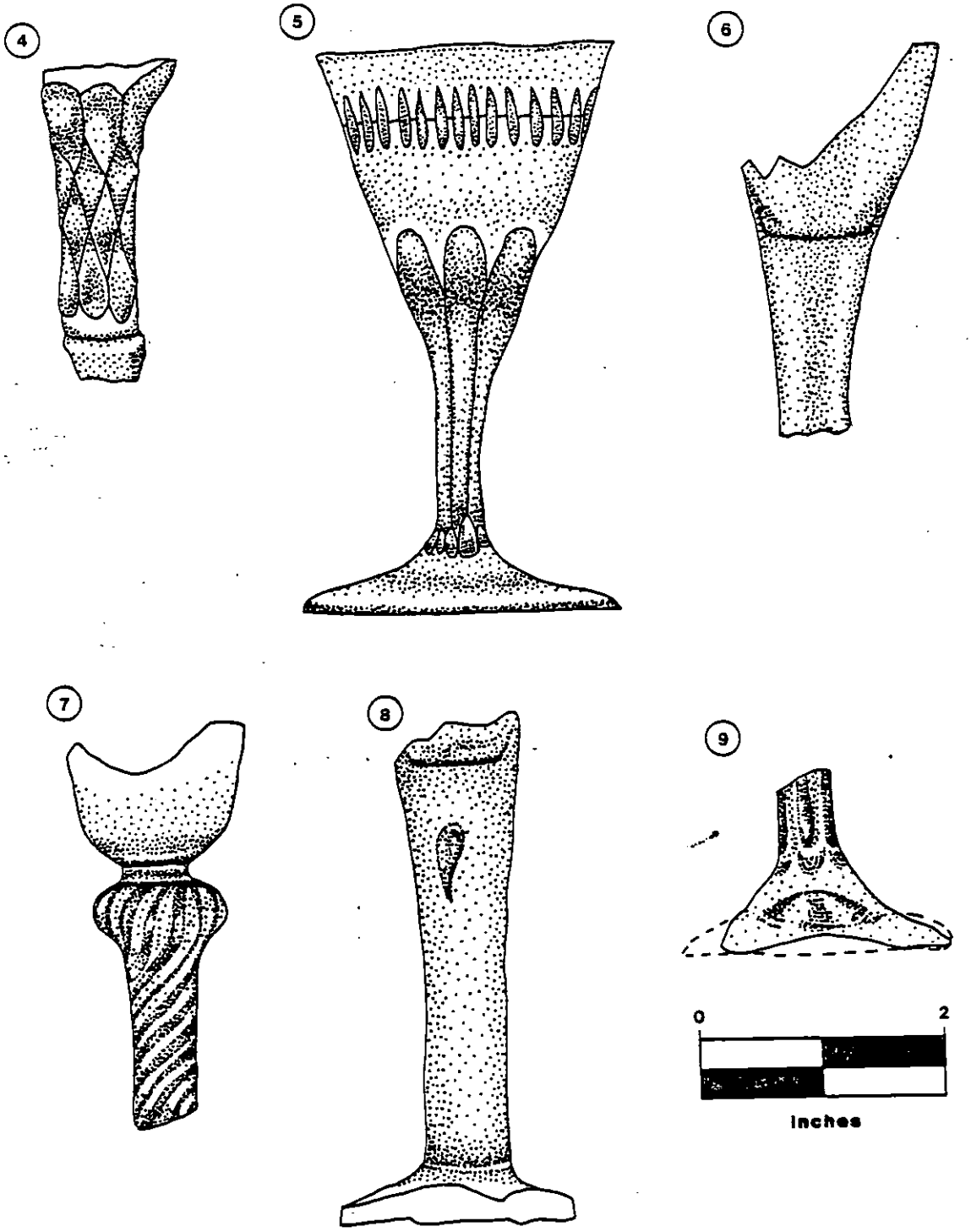
60. Flip glass. Stiegel-type wheel engraved decoration.

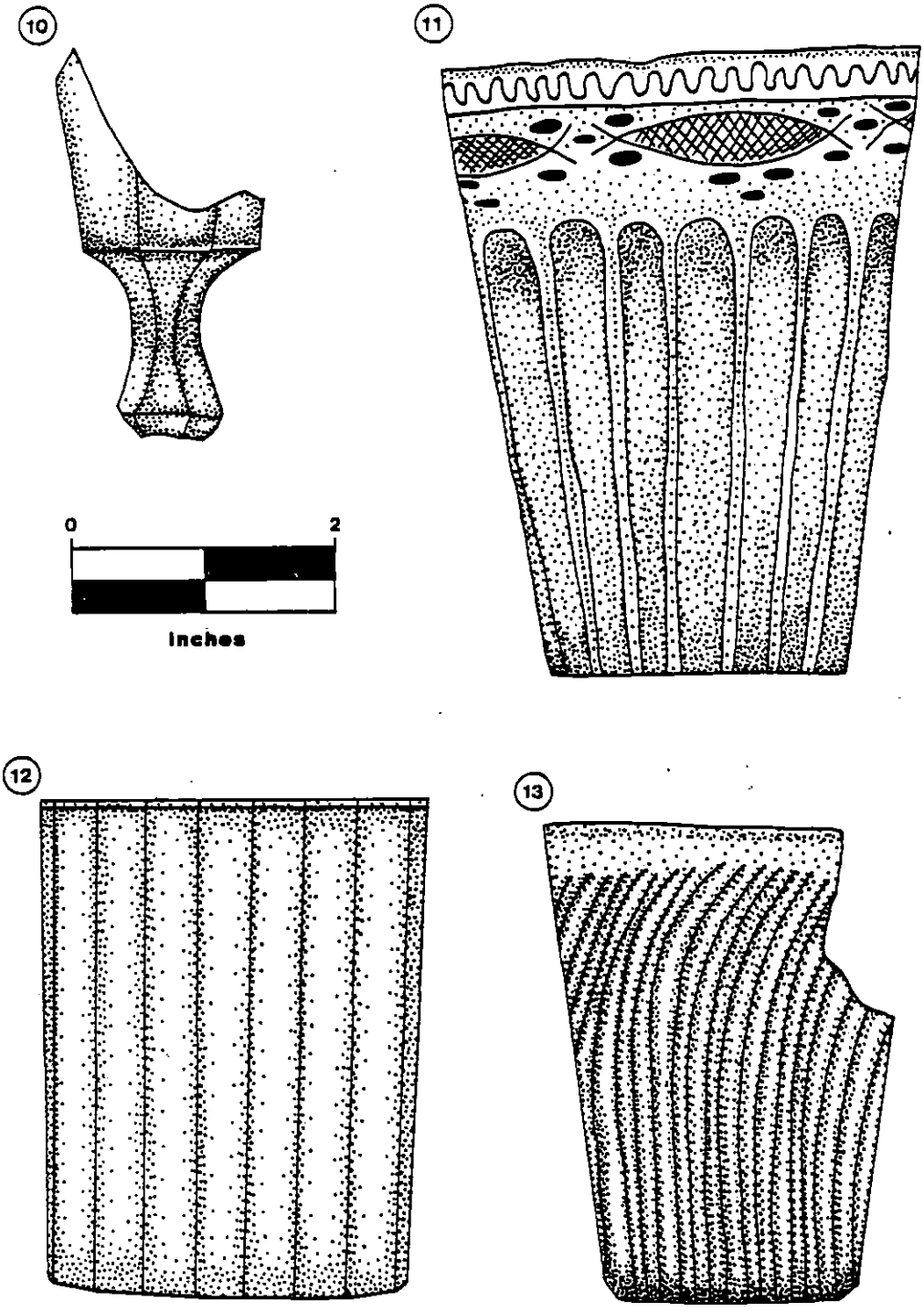
61. Bowl.

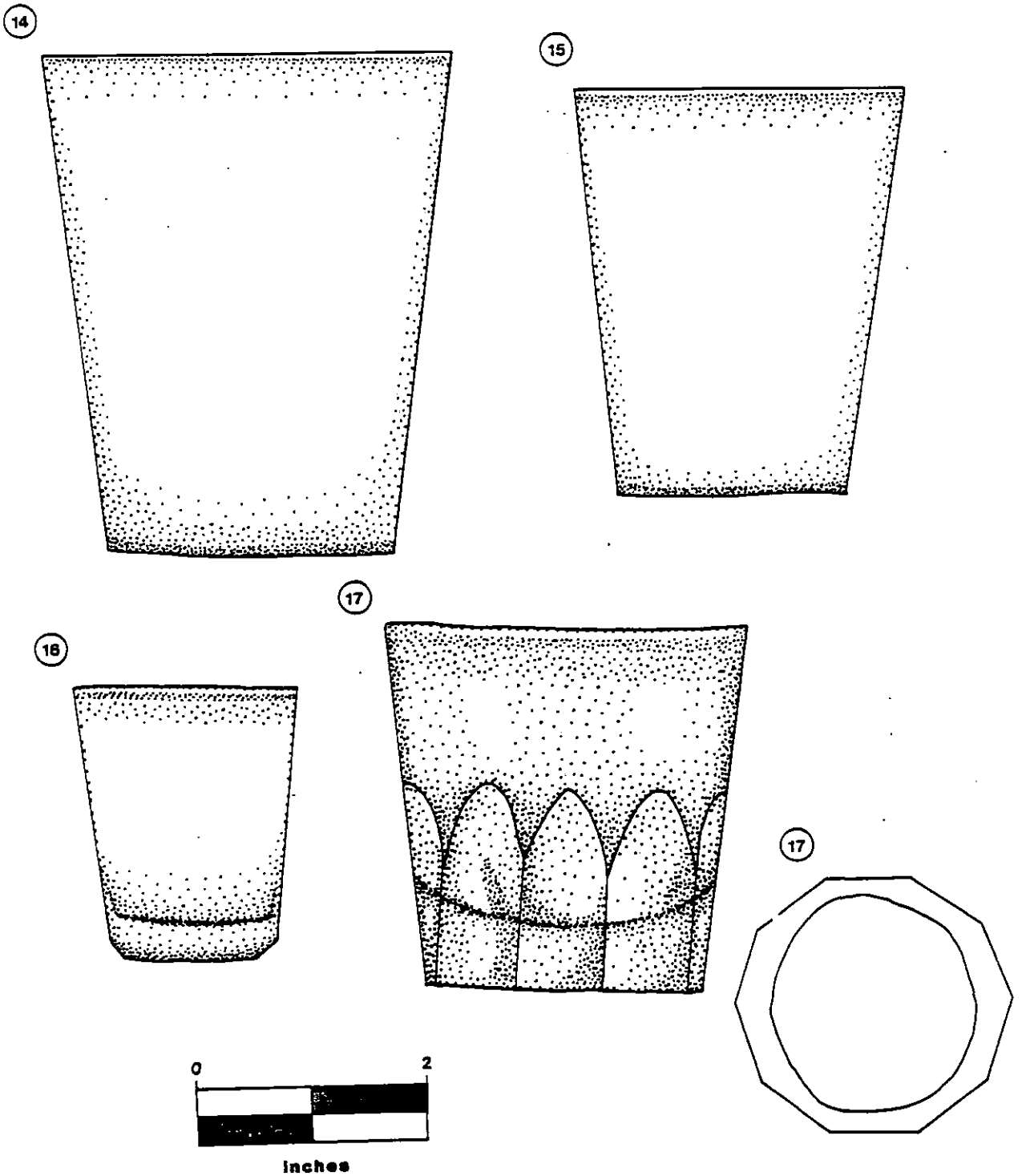
62. Stemmed wine glass. Straight stem with knop below bowl. Cat. #545.

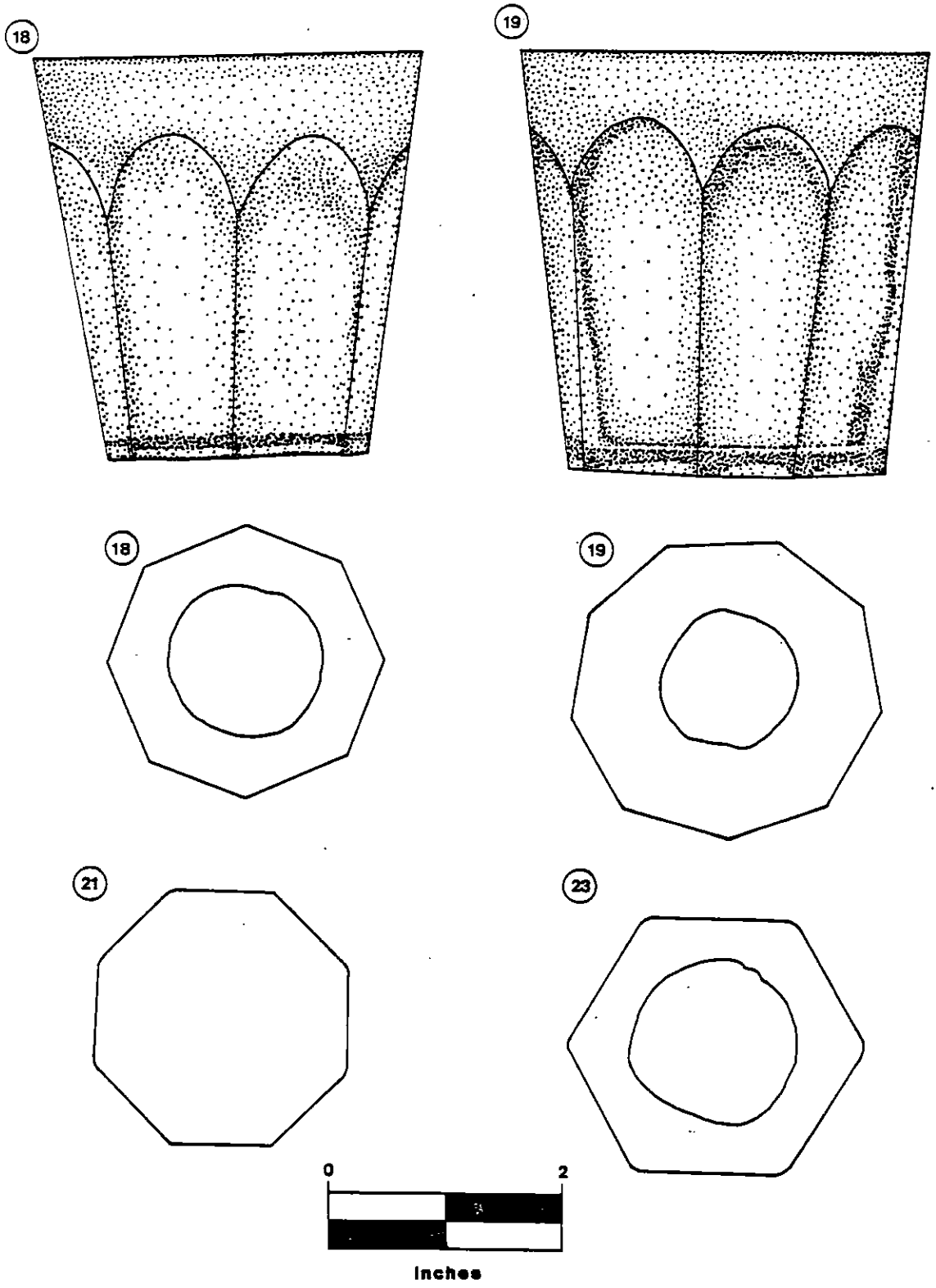
63. Tumbler. Stiegel-type wheel engraved decoration. Running Hound or Lion in circle with rays pointing outward. Cat. #511.

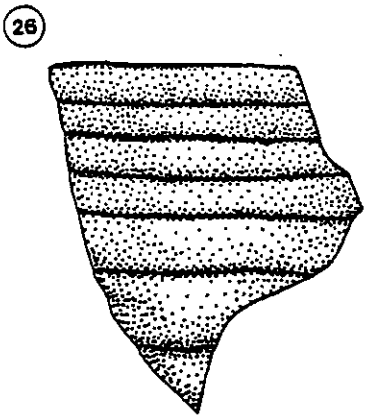

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Inches

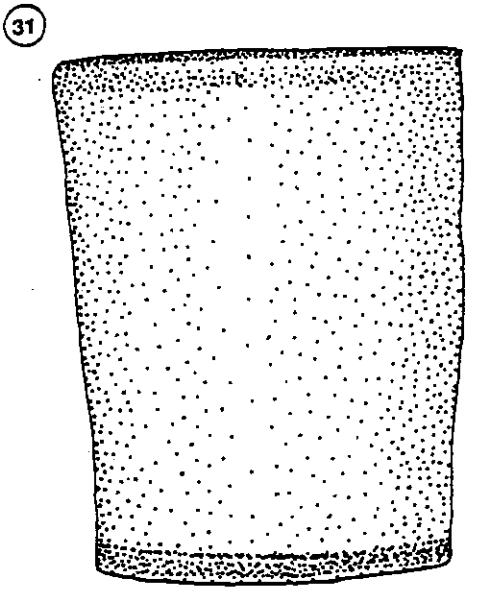

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9
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2
Inches

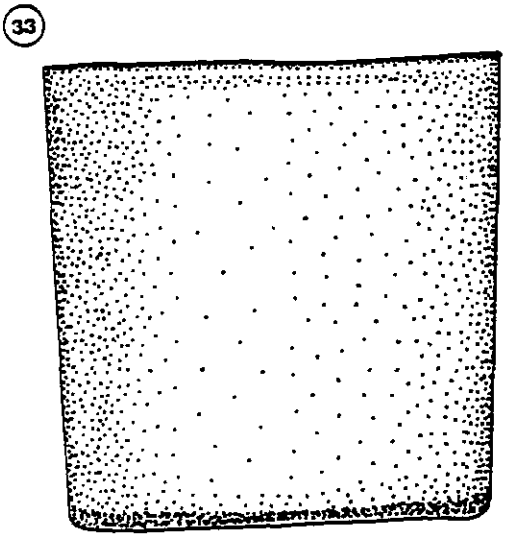

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Inches
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13

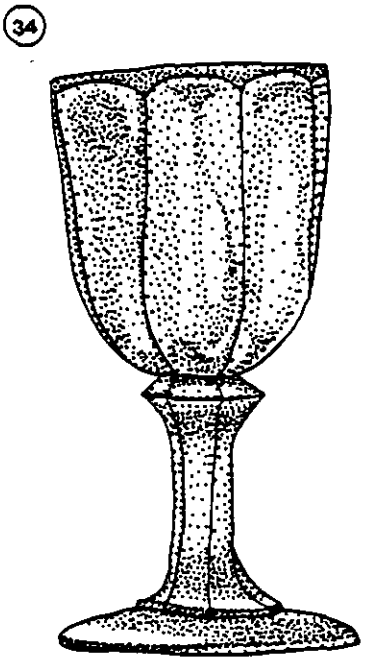

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18
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23
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2
Inches

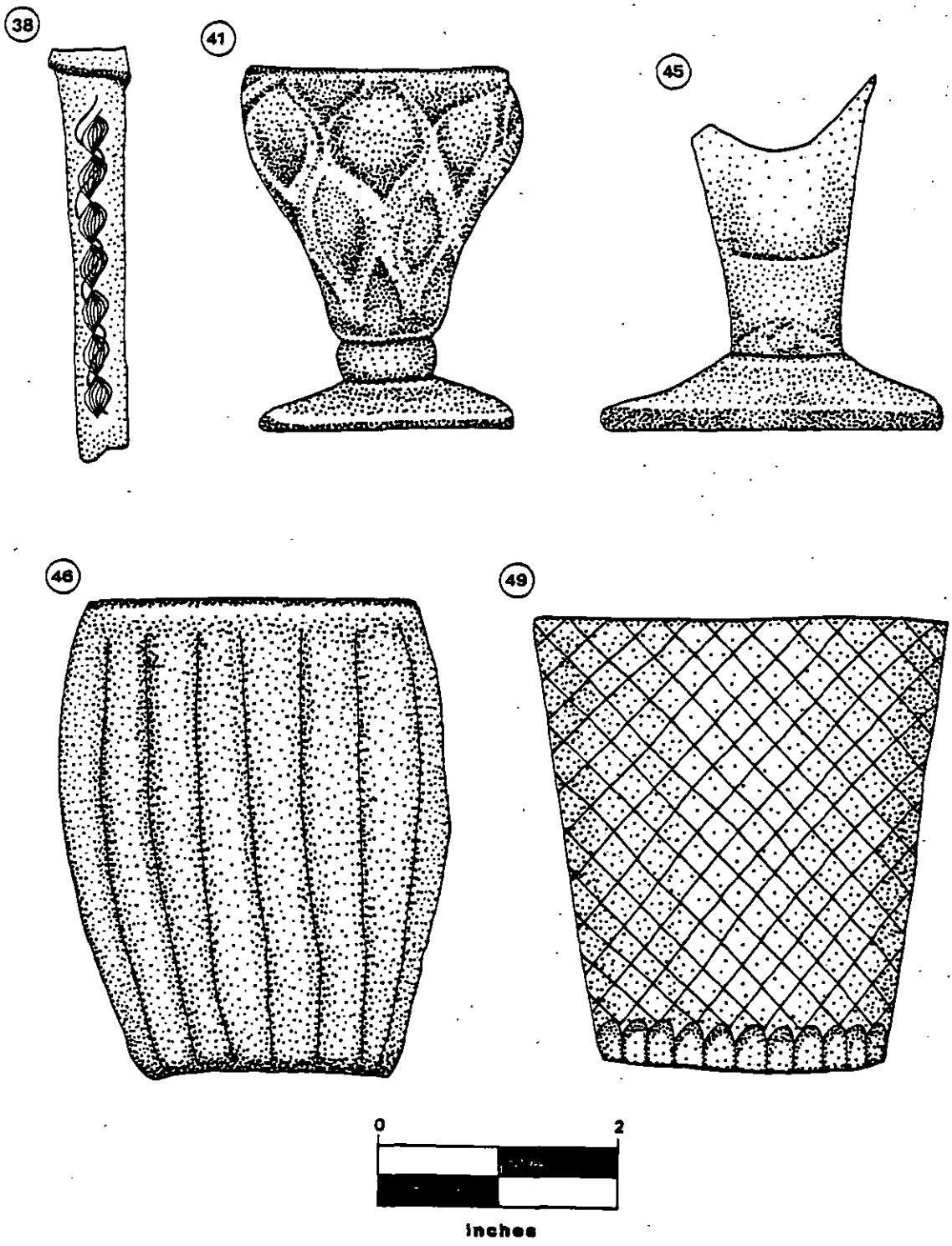

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31

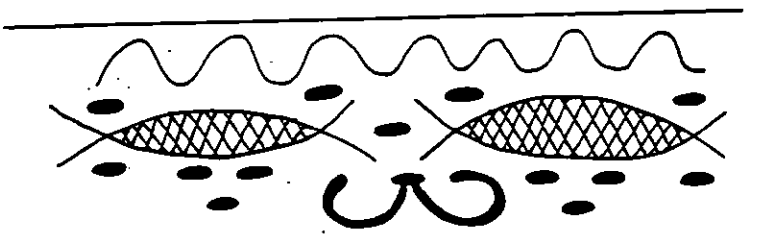

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34

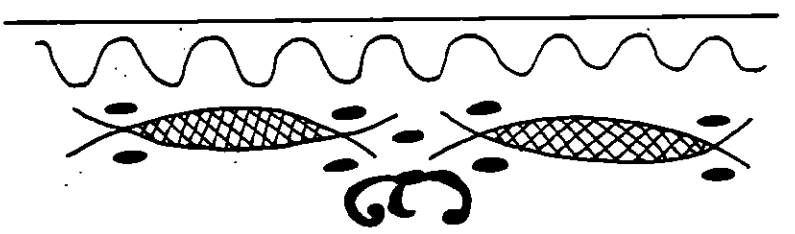

0
2
Inches


38
41
45
46
49
0
2
inches

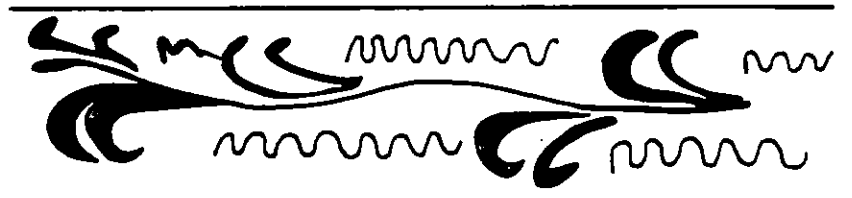
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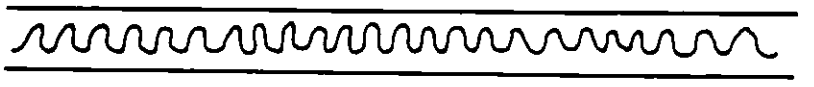
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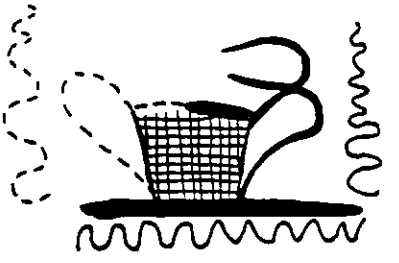
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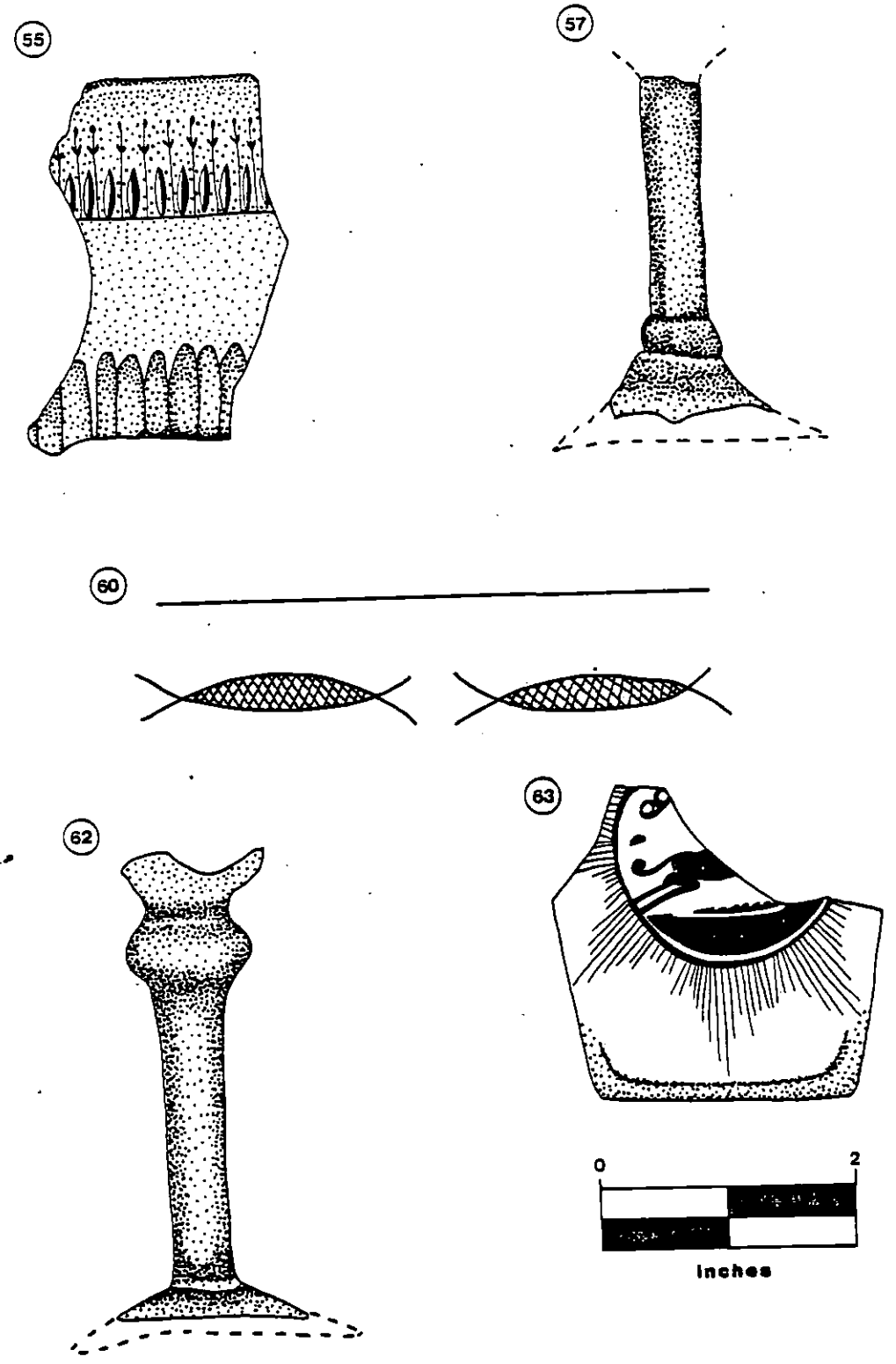


(53)



(54)




55
57
60
62
63
0
2
Inches

GLASS TABLE 4.1 (continued)

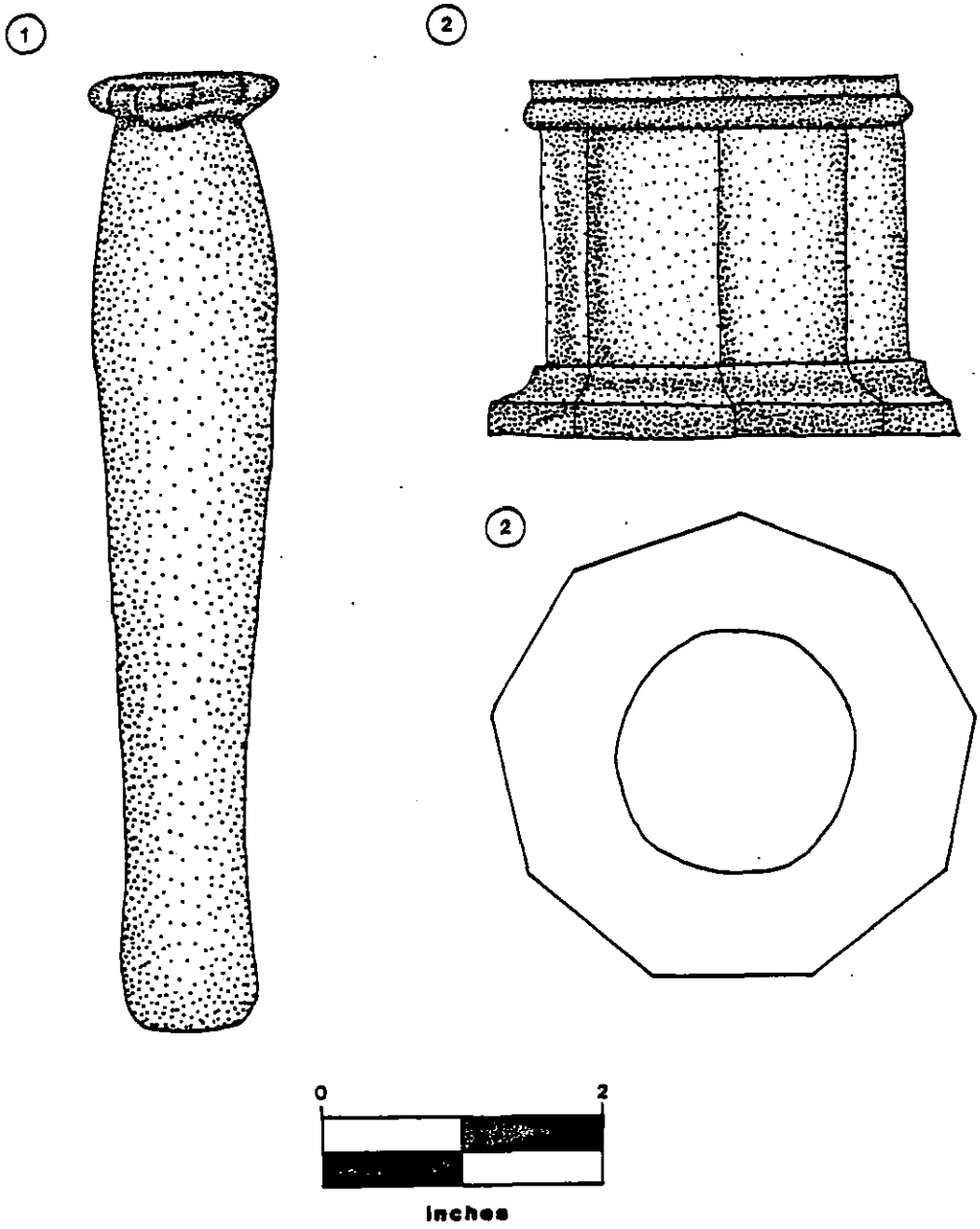
Window Glass (KC) (not illustrated)

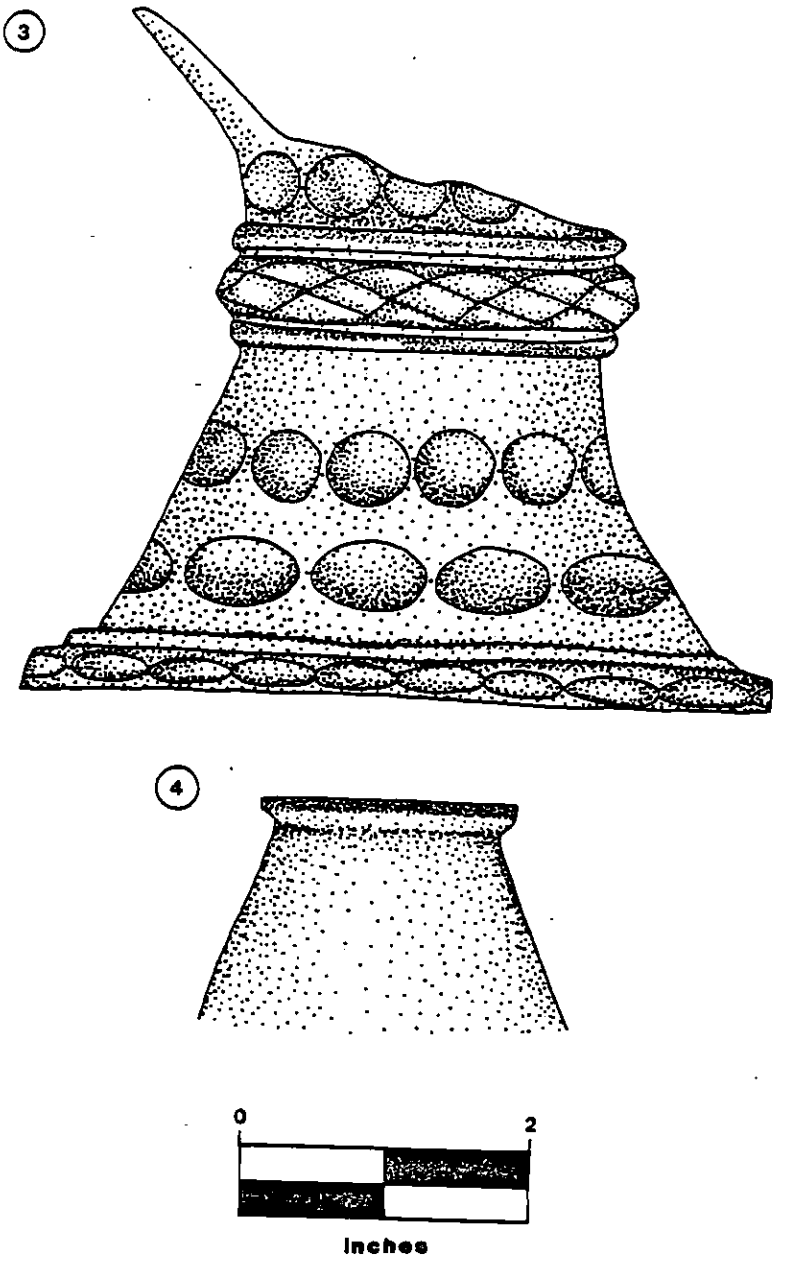
1. Sheet
2. Crown
3. Plate
4. Safety (embedded wire mesh)
5. Ridged (refrigeratior glass)
6. Melted window glass
7. Window worked into locket shape or small pane (chipped).
8. Acid etched window glass

"Other" Glass (KD), Partially Illustrated

1. Proof vial. For illustrated example see Stout (1972:74). With the exceptin of one example, all are blown firm leaded glass. Cat. #413.14. (Illustration 1)
2. Creme jar/comestic jar. Eight-sided. Ground pontil. Cat. #5065.2 (Illustration 2)
3. Lamp. Cut and wheel engraved decoration. Cat. #5074.14 (Illustration 3)
4. Lamp chimney. Undecorated. (Illustration 4)
5. Mirror
6. Melted unident glass
7. Slides (medical)
8. Glass tubing
9. Lid. Ground and threaded inside.
10. Light bulb.

98. Bottle cork
99. Total unidentified. Bottle and table glass.


1
2
2
0
2
inches


3
4
0
2
Inches

GLASS TABLE 4.2 175 WATER STREET: Finish Typology (Illustrated)
Note: this typology is based entirely on and illustrated with glass recovered from the 175 Water Street excavations.

Definitions

Hand tooled refers to a finish that was manufactured without the aid of a standarized lipping tool and instead utilized a pucellus. See Mckearin and Wilson (1978:12-14).

Lipping tool refers to a standarized device that was clamped over the applied glass at the neck of the bottle, then rotated to make a uniform lip. For examples see Munsey (1970:45).

Finish Typology (numbers refer to illustrations)

1. Flagged or everted finish. Cat. #299.6

2. Folded or rolled finish. Cat. 260.3

3. V-sectioned string-rim below plain, slightly flared lip. Similar to Noel Hume's (1974a:195) English finish type for 1735. Dated 1700-1740. Cat. #5125. Wine/Liquor.

4. Everted mouth over tooled-down string-rim. Similar to Noel Hume's (1974a:195) English finish types for 1755-1765. To be more inclusive I have extended this to 1745-1765. Both examples are from the deeptest in lot 29/30. Wine/Liquor.

5. Slightly beveled lip above string-rim that is blended into neck. Constriction of neck below string-rim. Similar to Noel Hume's (1974a:195) type for 1780. To be more inclusive I used 1770-1800 for this type. Cat. #8074.4. Wine/Liquor.

6. Slight to heavily beveled lip above flattened squared-off string-rim. Slight constriction below string-rim. Similar to Noel Hume's (1974a:195) finish type for 1780. However, I have used a date of 1780-1815 for this type. Cat. #397.60. Wine/Liquor.

7. Wide sloping collar above bevel. "Saratoga" finish from a "Clarke and White, Saratoga" mineral water. Cat. #381.69. Lipping tool.

8. Large graduated or "oil finish", usually associated with a carboy. Cat. #383.74. Lipping tool used.

9. Sloppily applied flattened string-rim below wetted-off lip. Associated with demijohn. Cat. 383.

10. Slightly rounded collar above bevel. Cat. #383.13. Lipping tool. Wine/Liquor.

GLASS TABLE 4.2: Finish Typology (continued)

11. Deep sloping collar above V-sectioned bevel. Cat. #381.73. Lipping tool used.

12. Deep sloping collar above flattened bevel. Hand tooled pouring spout. Master Ink. Cat. #383.6

13. Wide, flat collared lip. Case bottle. Cat. #8044.2

14. Flattened string-rim applied below plain lip. Lipping tool used. Usually champagne or wine. Cat. #397.56.

15. "Oil" finish. Deep sloping collar. Medicine or oil. Cat. #397.4. Lipping tool and band tooled.

16. Flattened string-rim below plain lip. "Ladies leg" shape. Lipping tool used. Whiskey (?). Cat. #434.24.

17. Thickly applied and hand tooled collar. Probably from Decanter. Cat. 5093.6.

18. Deep sloping collar above flat or sometimes rounded lower bevel. Lipping tool used. Usually associated with stout or ale bottles. Cat. #398.

19. Rounded collar above flared lower bevel. Usually associated with beer, stout, ale, cider, porter bottles. Cat. #381.68.

20. Small rounded collar. Similar to finish type #2 except this utilized a lipping tool in the finishing process. The diameter is also greater. Usually associated with food bottles, tablets or chemicals. Cat. #397.1.

21. Flared finish. Slight protrusion at outside of lip. Associated with decanter. Inside of neck usually ground for stopper. Cat. #8074.6.

22. V-sectioned string-rim below plain lip. Lipping tool used. Usually champagne. Cat. #8066.1.

23. The appearance of this finish is similar to finish type #1. However, instead of being simply drawn out, this type is drawn out and folded back over to the inside (probably for added strength). Hand tooled. Usually on a vial. Cat. #5118.1.

24. Rounded collar at lip with collar-rib at base of short, wide neck. Lipping tool used. Cat. #407.5.

25. Rounded or sloping collar above rounded or sloping bevel. Large amount of variation. Lipping tool used. "Brandy" finish. Cat. #383.16.

26. String-rim applied directly on lip. Hand tooled. Associated with "chestnut" bottles of small calabash of late-eighteenth to early-nineteenth century. Liquor. Cat. #5137.76.

GLASS TABLE 4.2: Finish Typology (continued)

27. Wetted-off (or sheared) and fire polished. Usually on flasks, particularly pocket flasks. Cat. #5275.2.

28. Wetted-off (or sheared) and not fire polished. May be on bottles of varying function.

29. Prescription lip. From Putnam (1965:20), a 1902 Illinois Glass Co. Catalog. Similar to Whitall, Tatum, and Co.'s 1880 prescription lip (1971:7).

30. Flared mouth. From Putnam (1965:20), a 1902 Illinois Glass Co. Catalog. Similar to Whitall, Tatum, and Co.'s 1880 bead finish (1971:7).

32. Rounded collar above bevel. Cat. #5151.33

33. Sloppily applied flattened string-rim below wetted-off and fire polished lip. Champagne/wine. Cat. #373.39.

34. Beadlike string-rim applied below wetted-off and fire polished lip. Hand tooled. Wine bottle. Cat. #5145.4.

35. Screw top. Automatic bottle machine. Cat. #5019.1

36. Wetted-off and fire polished flared finish. "Flacon".

37. Everted finish. Similar to type 1, but on case bottle. Large diameter. Case bottle. Cat. #5204.

38. Ground finish. Lamp. Cat. #657.4.

39. Extract lip. From Putnam (1965:20), a 1902 Illinois Glass Company catalog.

40. Sloppily applied flattened string rim on lip. Hand tooled. Cat. #92.16.

41. Rounded collar above bead. Cat. #92.15

42. Wetted-off and fire polished lip with hand tooled pouring spout. Cat. #647.1.

43. Folded inside of lip. Hand tooled. Cat. #377.10

44. Flattened collar below plain lip. Lipping tool used. Hock wine. Cat. #5287.9.

45. Rounded collar above rounded lower collar of approximately the same size. Lipping tool used. Cat. #375.4.

46. Flaring lip above markedly flaring lower.

47. Applied string-rim. Crimped. Proof vial. Hand tooled. Cat. #410.42.

GLASS TABLE 4.2: Finish Typology (continued)

48. Flattened string-rim below non-uniform slight sloping collar. Cat. #116.2.

49. Thin slightly flattened string-rim applied below wetted off and fire polished lip. Toilet water. Cat. #5327.399.

50. Applied, circular sectioned string-rim below plain wetted-off and fire polished lip. Hand tooled. Wine. Cat. #5340.493/491.

51. Applied string rim (upturned and beveled) below plain lip. Hand tooled. Wide mouth. Cat. #8147.5.

52. Thick beaded finish. Hand tooled. Flacon. Similar to finish of bottle on cover of "The Glass from Fort Michilimackinac" (Brown 1971).

53. Ground finish. Cat. #5190.5.

54. Crown closure. Lipping tool or ABM. Cat. #5029.1.

55. Rounded collar above rounded bevel. Common finish type on strap-sided whiskey flasks. Lipping tool. Cat. #5019.14.

56. Large flat collar above bead. Wine or liquor finish. Lipping tool. Cat. #5019.15.

57. Square band with bead midway up neck. Automatic Bottle Machine. Ink.

58. Flared or everted finish. Hand tooled. Decanter. Cat. #609.1517.

59. Wetted-off and hand tooled lip. Large diameter. Species jar. Cat. #8100/1.

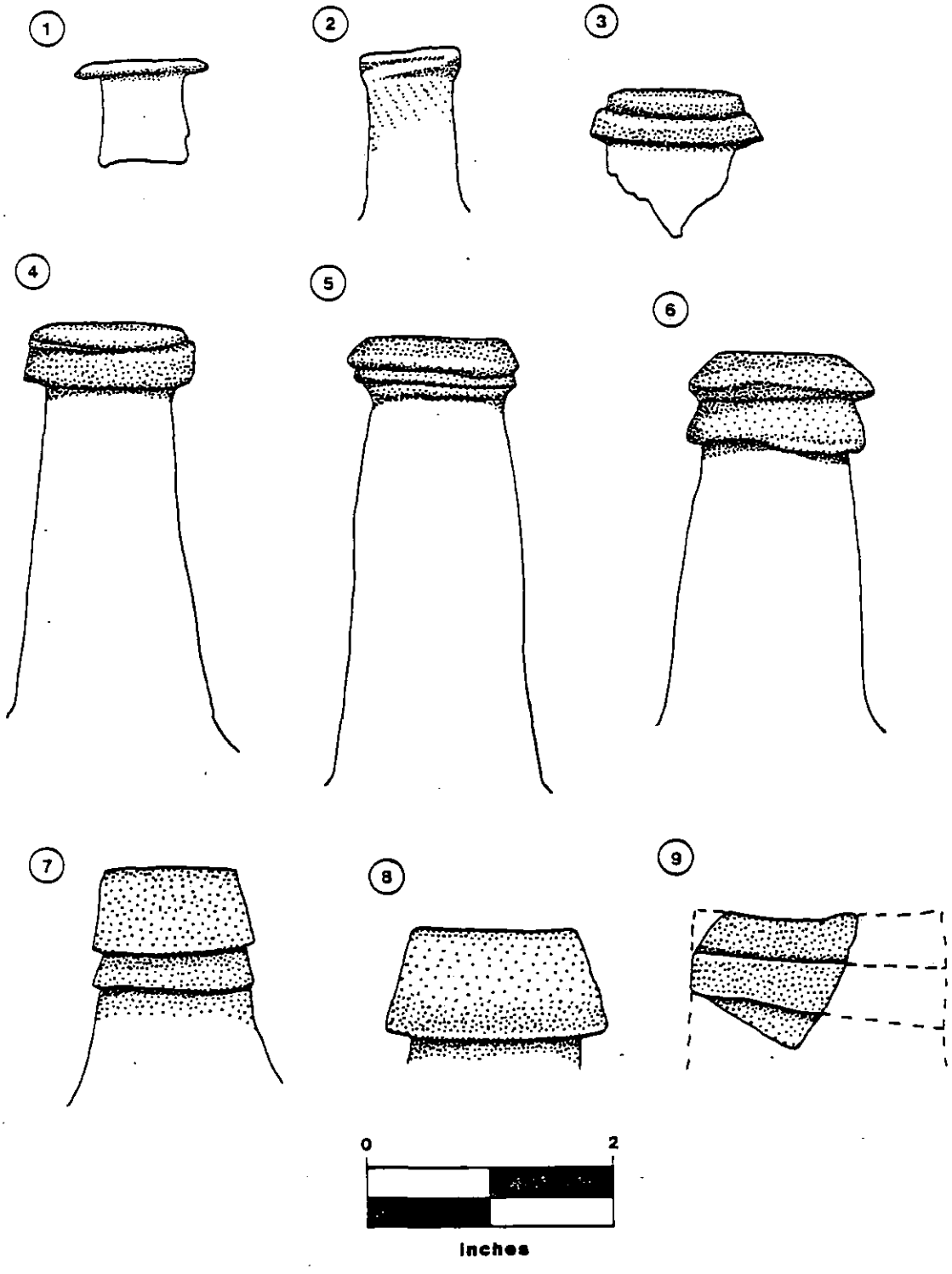
60. Flat collar above bead. Similar to type #55. Wine/Liquor flask. Automatic Bottle Machine. Cat. #5019.16.

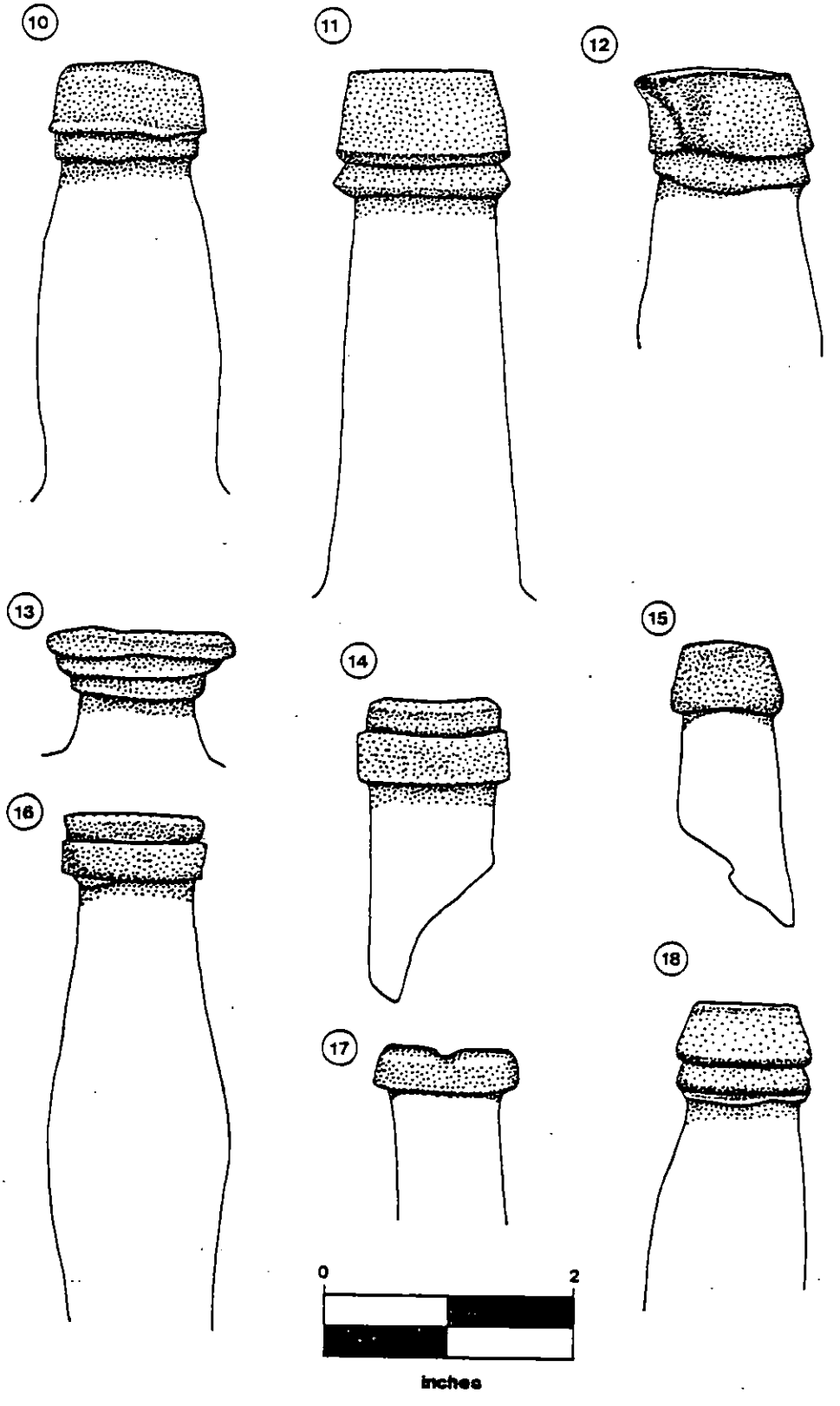
61. Applied string-rim below slightly flared but plain lip. Case bottle. Hand tooled. Cat. #554.543.

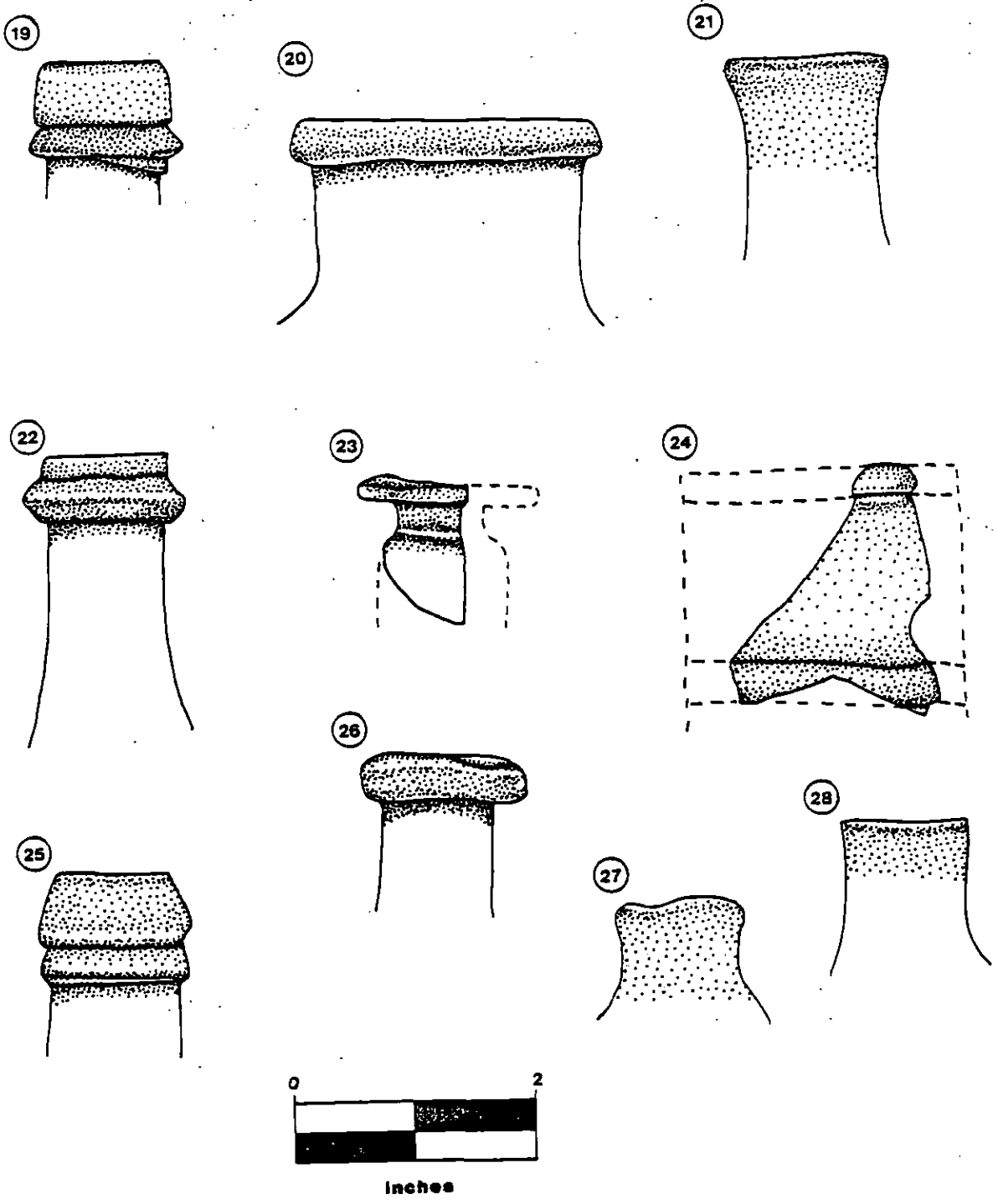
62. Square applied string-rim below, and blended in with plain lip. Wine/Liquor. Cat. #5143.15.

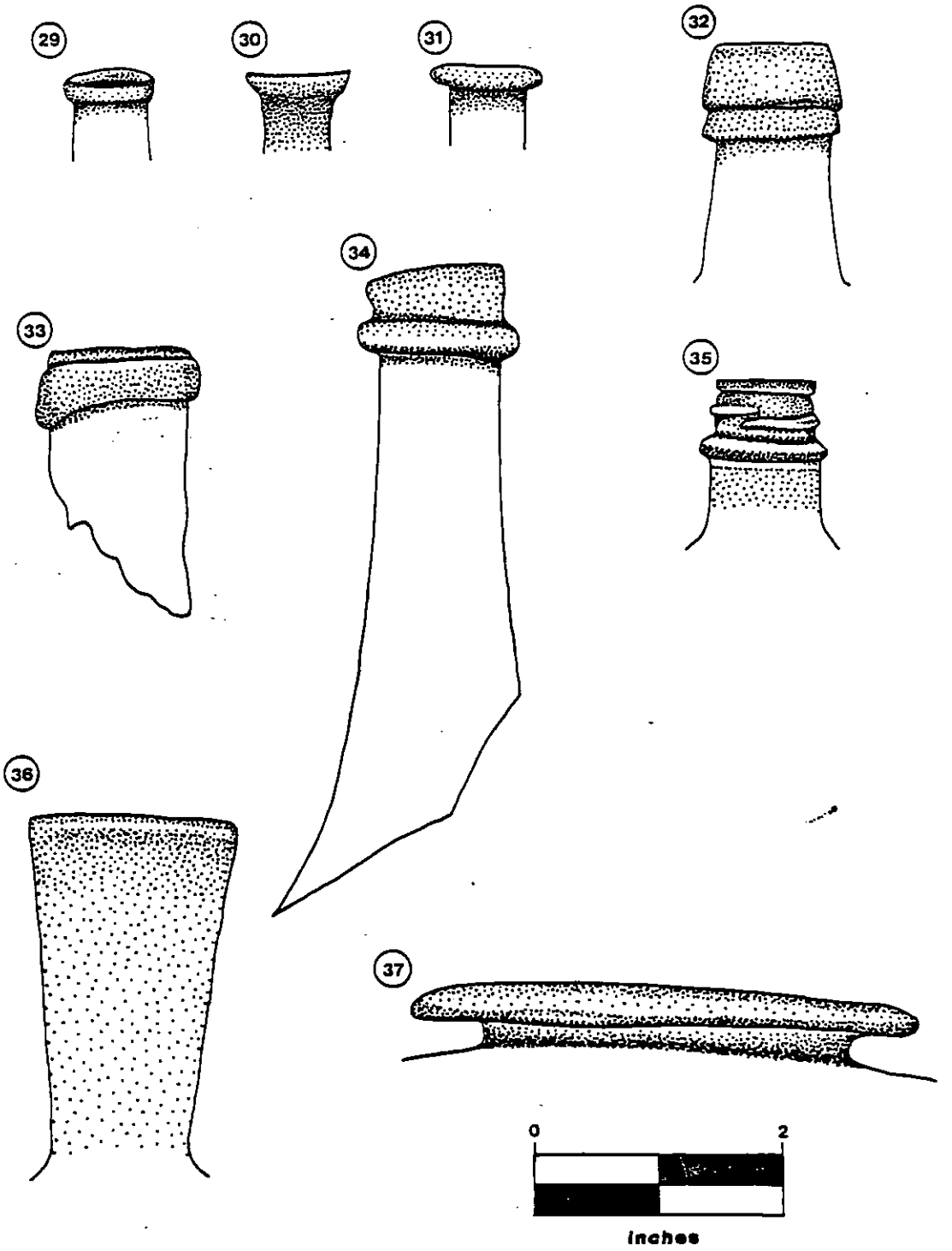
63. Large, rounded collar on long neck. Demijohn or carboy. Cat. #649.

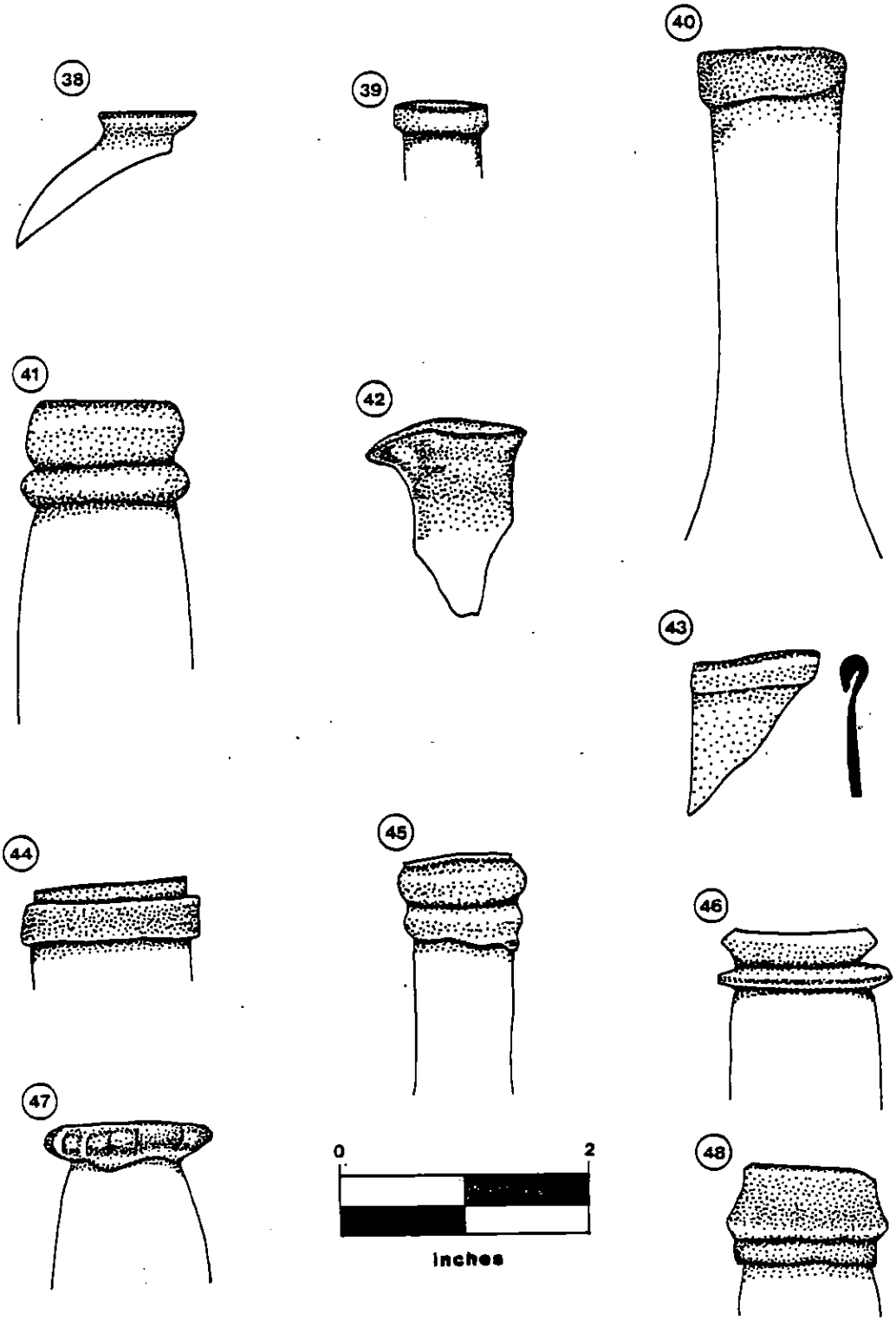
64. Rounded collar. "Blob top". Soda, mineral water or beer. Taken from Putnam (1965).

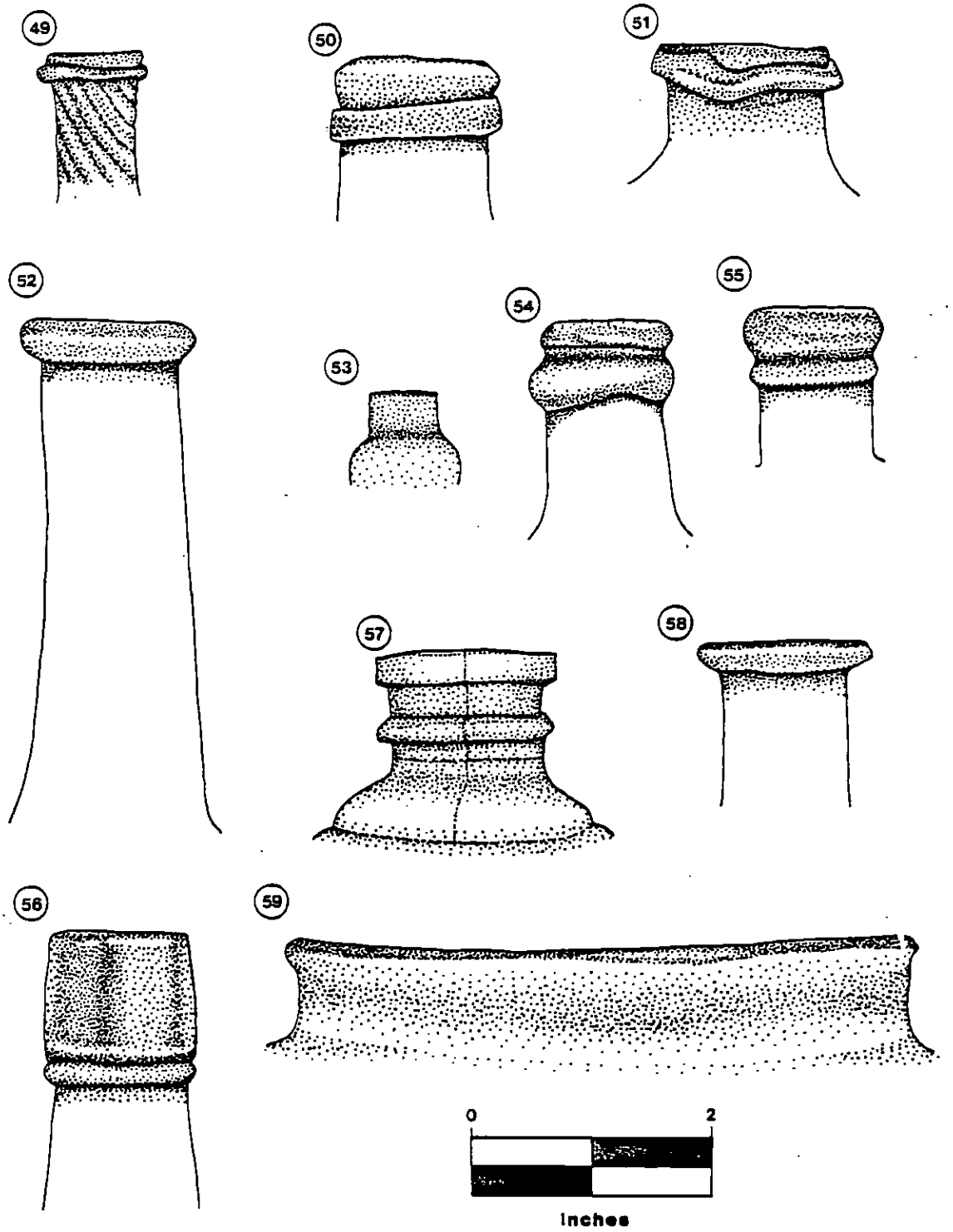

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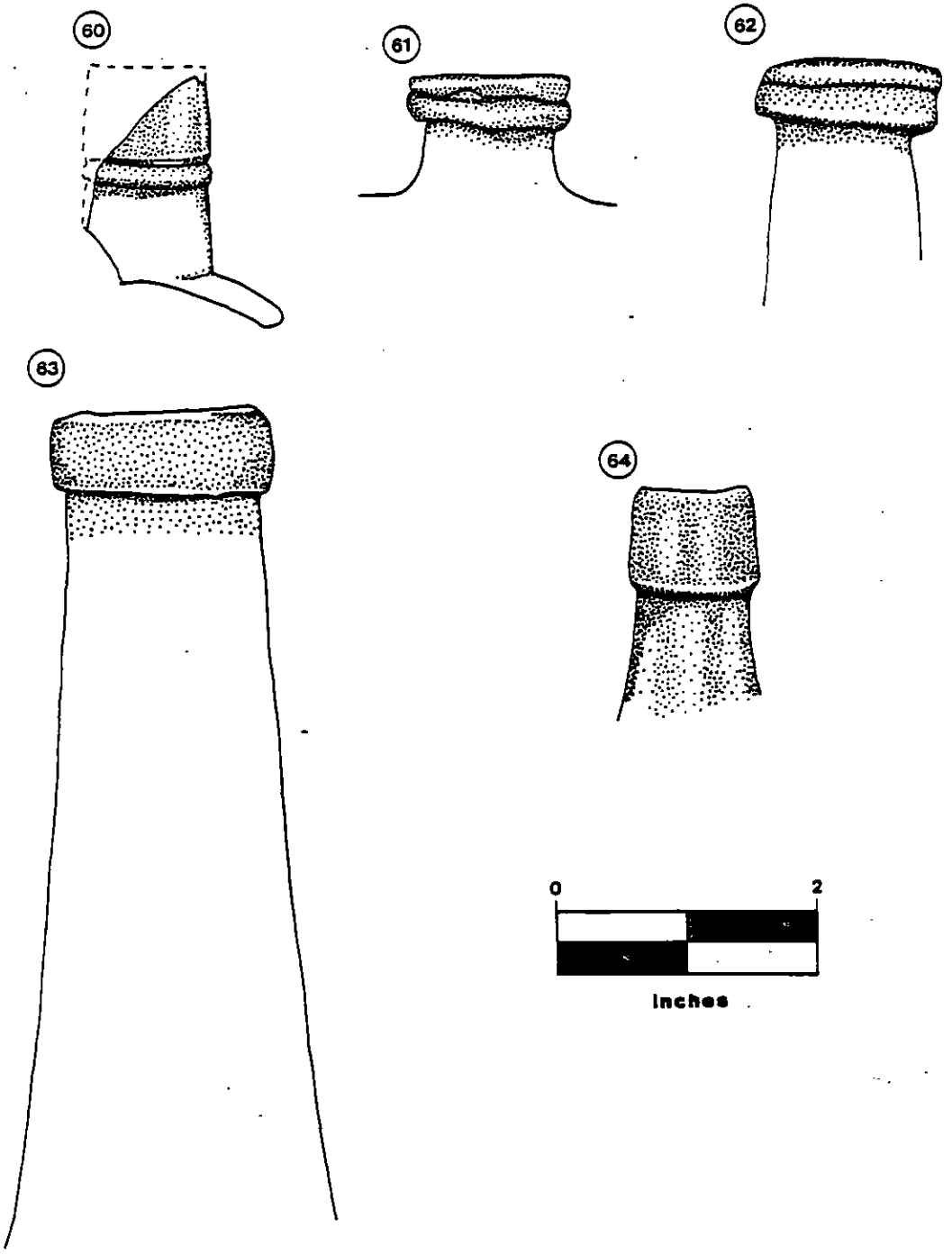

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58
56
59
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2
Inches


60
61
62
63
64
0
2
Inches

GLASS TABLE 4.3 175 WATER STREET: Technology and Attributes
(number refers to computer code)

Lead/Non-lead

1. lead
2. non-lead

Base

0. Sand pontil
1. Blowpipe pontil scar
2. Solid Iron Bar
3. Bare Iron (Reddish brown)
4. Bare Iron (white)
5. Quadrefoil Pushup w/sand pontil
6. Ground pontil
7. Snap case
8. Machine cutoff scar
9. Pedal operated pushup

Color

0. Olive green/black
1. Brown/amber/honey
2. Emerald/Tea
3. Cobalt
4. Aquamarine (various shades)
5. Milkgrass
6. Clear or "white" glass
7. Nail sea
8. Clear w/amethyst tint
9. Olive amber

Wear

1. Very heavy
2. Heavy
3. Slight
4. None
5. Waterworn or rolled
6. On inside/fill
7. N/A due to patination
8. Flawed/kiln furniture

Mold Markings/Manufacturing Technique

1. Freeblown
2. Dip-molded (i.e. molded for body form)
3. Mold-blown (mold type indeterminate)
4. Pressed
5. Three piece mold w/dip mold body
6. Three piece mold w/dip mold body and lettered ring mold

GLASS TABLE 4.3: Technology and Attributes (continued)

Mold Marking/Manufacturing Technique

7. Two piece hinged-bottom mold
8. Cup-bottom mold
9. Mold blown and cut
10. Two piece post-bottom mold
11. Automatic bottle machine
12. Pattern mold (general category) vertical ribs number? (dip molded)
13. Free blown and cut
14. Turn mold
15. Unknown
16. Two-piece pattern mold (+ expanded sometimes). Diamond pattern (general) "piece molded".
17. Piece mold - two piece pattern mold.
18. 16 vertically ribbed dip mold and swirled to left
19. 16 vertically ribbed dip mold (not swirled)
20. Unknown mold. Nineteenth century.
21. Probable piece-mold (i.e. two piece) panelled at base, diamond at top, used in tumbler.
22. Vertically ribbed dip mold - 32 ribs, and swirled to right.
23. Blown in dip mold, taken out, swirled and blown in dip mold again.
24. Vertically ribbed (general) swirled to left.
25. Blown-three-mold.
26. "German" halfpost method.
27. Piece molded. 16 rows of horizontal diamonds.
28. Vertically ribbed. Swirled to right (general)
29. Pressed, cut, and engraved
30. 8 vertical ribs (diamond)
31. Cut
32. Coil method.
33. 8 rows of horizontal diamonds (piece mold).
34. 14 vertical ribs
35. 22 vertical ribs. Swirled to left
36. 14 rows of horizontal diamonds (piece mold).
37. 12 vertical ribs.
38. 11 vertical ribs. Swirled to left.
39. 24 vertical ribs.
40. 19 vertical ribs.
41. 18 vertical ribs.
42. Alternate rows of flutes and diamonds. Piece mold. (McKearin and Wilson 1978:366-67, #1).

GLASS TABLE 4.4 175 WATER STREET: Origin (number refers to computer code)

1. The Continent/Europe
2. England
3. United States
4. France
5. Holland
6. Germany
7. Ireland
8. New England
9. Portugal
10. China
11. New York City
12. Philadelphia
13. Paris
14. London
15. Schiedam, Holland
16. Castleford
17. Burslem
18. Stoke-on-trent
19. Denby
20. Statfordshire
21. Keene N.H. "Marlboro St."
22. Newburg N.Y.
23. Elizabethtown, N.J.
24. Morristown, N.J.
25. Rahway, N.J.
26. Rupert, V.I.
27. New Haven, Conn.
28. Lima and/or Mexico City
29. San Francisco
30. Saratoga, N.Y.
31. Wales
32. Korea
33. Liverpool
34. Evansville, Indiana
35. Dyottville Glassworks, Philadelphia
36. Bordeaux
37. Northeastern U.S.
38. Chester, England
39. Gouda
40. England/Holland
41. Local
42. Midwest
43. Other temperature (Calif.)
44. Tropic/semi-tropic (e.g. South Florida, Carribean, South America)
45. Arid (Southwest, Mexico)
46. North (Northern New England Canada)
47. Old World Import
48. Not Used
49. Not Used
50. Amsterdam
51. Venice
52. North Africa
53. Eastern Europe
54. Hungary
55. Bristol, England
56. Baltimore, Maryland
57. Illinois
58. Marseille

Glass Table 4.5 175 WATER STREET: Glass Data, All Features

Feat. #	Lot	Feat. Type	Feat. Level	Sherd #	Datable Sherd #	MNV	Sherd Types, by % KA	KB	KC	KD	Wear	Dates Mean*	Mode*	Bracketed Dates**	GTPQ	Comments
1	36	c	1.1	2616	77	145	44.3	11.7	37.1	6.9		1879	1880	1780-1910	1890	Primary commercial deposit within a redeposited fill matrix. See text.
			1.2	32	1	4	34.4	18.8	46.9	0		1700	1700	1680-1720	1680	"
			1.9	53	13	8	52.8	0	43.4	3.8		1707	1700	1680-1810	1780	"
T1				2701	91	157	44.1	11.8	37.2	6.8	h	1852	1700	1680-1910	----	---------
2	33	p	2.1	1091	3	28	24.5	1.6	54.6	19.4		1897	1926	1857-1910	1891	Primary commercial deposit within redeposited material. See text.
			2.2	1586	175	67	74.2	3.5	16.6	5.7		1806	1798	1760-1880	1870	"
			2.9	62	0	1	54.8	12.9	32.3	1.2		----	----	-----	----	"
T2				2739	224	99	54.9	3.2	30.4	11.6	h	----	----	-----	----	---------
3	33	c	3.1	1281	22	8	45.7	3.1	17.3	33.8		1814	1815	1750-1850	1800	Redeposited material.
			3.2	260	0	1	60.1	3.1	27.8	9.0		----	----	-----	----	"
			3.9	83	0	5	45.8	16.9	36.1	1.2		----	----	-----	----	"
T3				1624	22	14	48.5	3.2	18.9	29.5	vh	1814	----	1750-1850	----	---------
4	33	c	4.1	459	101	11	71.7	5.4	20.7	2.2		1802	1798	1780-1860	1825	Undetermined primary deposit within redeposited fill matrix. See text.
			4.2	191	79	4	66.5	5.2	24.6	3.7		1798	1798	1780-1815	1780	"
			4.3	252	0	5	39.3	9.5	48.4	2.8		----	----	-----	----	"
T4				902	180	20	61.5	6.5	29.3	2.7	h	1799	----	1780-1860	----	---------
5	33	bt	5.1	686	40	16	63.6	2.6	31.5	2.3	h	1914	1926	1790-1900	1891	Engineering fill.
6	33	bt	6.1	105	0	2	21.0	1.0	65.7	12.4		----	----	-----	----	"
7	33	bl	7.1	2	0	N/A	50.0	50.0	0	0		----	----	-----	----	Redeposited material.
8	33	a	8.1	456	3	12	48.7	2.9	35.3	12.2	s	1825	1860	1850-1870	1850	Wooden floor.
9	33	a	9.1	88	0	1	64.8	4.5	23.9	6.8	s	----	----	-----	----	Redeposited material.
10	33	a	10.1			N/A	--	--	--	--		----	----	-----	----	Brick platform.
11	33	a	11.1	27	0	N/A	18.5	0	66.7	14.8		----	----	-----	----	Wooden floor.
12	33	a	12.1	23	0	N/A	13.0	8.7	65.2	13.0		----	----	-----	----	Wooden floor.
13	33	a	13.1	3	0	N/A	33.3	0	66.7	0		----	----	-----	----	Metal.
14	33	bt	14.1	25	0	1	48.5	12.1	39.4	0	vh	----	----	-----	----	Engineering fill.
15	33	bt	15.1	30	16	N/A	80.0		10.0	10.0		1785	1785	-----	1770	"
16	33	a	16.1	45	38	1	88.9		8.9	2.2	s	1818	1818	1800-1835	1800	"
17	33	a	17.1	278	2	5	52.9	7.2	39.9	0	h	1753	1800	1680-1820	1780	"
18	33	a	18.1	113	0	N/A	27.2	7.0	65.8	0		----	----	-----	----	"
19	33	a	19.1	186	0	3	47.3	33.3	18.8	.5	s	----	----	-----	----	Brick platform.
20	33	a	20.1	101	0	N/A	55.4	2.0	24.8	17.8		----	----	-----	----	Flower box.
21	33	a	21.1	76	0	N/A	71.1	1.3	9.2	18.4		----	----	-----	----	Engineering fill.
22	33	bt	22.1	14	1	1	42.9	7.1	50.0	0		1768	1768	1755-1780	1755	"
23	33	a	23.1	221	0	1	47.1	2.7	49.8	.5		----	----	-----	----	"
24	33	bt	24.1	39	0	N/A	73.3	2.9	23.8	0		----	----	-----	----	"
25	33	bt	25.1	1490	77	12	59.5	3.1	26.2	11.3	s	1797	1798	1780-1815	1820	"
26	33	a	26.1	37	0	N/A	10.8	10.8	78.4	0		----	----	-----	----	"
27	33	lf	27.1	518	46	6	37.6	8.1	51.8	2.5	h	1795	1800	1745-1820	1780	Sheet refuse.
28	33	lf	28.1	183	18	2	38.0	3.3	545.7	4.1		1794	1798	1770-1815	1780	"
29	33	bt	29.1	26	0	N/A	57.7	0	34.6	7.7		----	----	-----	----	Engineering fill.
30	32	bx	30.1	2084	85	60	33.4	5.7	55.3	5.7		1799	1798	1780-1840	1813	Primary domestic.
			30.2	1472	154	66	17.9	31.1	44.6	6.3		1797	1798	1780-1815	1780	"
			30.3	101	3	4	21.8	35.6	40.6	2.0		1799	1793	1780-1830	1790	"
			30.4	50	14	7	62.0	8.0	28.0	2.0		1751	1755	1680-1830	1790	"
T30	32	bx		3707	256	137	26.8	16.8	50.6	5.8	h	1795	1755	1680-1840	----	---------

(continued)

GLASS TABLE 4.5 (continued)

Feat. #	Lot	Feat. Type	Feat. Level	Sherd #	Datable Sherd #	MNV	Sherd Types, by % KA	KB	KC	KD	Wear	Dates Mean*	Mode*	Bracketed Dates**	GTPQ	Comments
31	30	bl	31.1	135	61	10	76.3	8.1	14.8	.7		1785	1785	1745-1830	1790	Domestic refuse within redeposited fill. See text.
			31.2	4	0	1	100.0					----	----	-----	----	"
T31						11	77.0	7.9	14.4	.7	h	1785	----	1745-1830	----	---------
32	23	p	32.1	1829	95	17	13.7	1.4	84.5	.3		1879	1870	1750-1910	1880	Primary commercial deposit within a redeposited *matrix*. See text.
			32.2	398	41	13	29.6	16.3	51.0	3.0		1813	1810	1725-1880	1860	"
			32.3	4	10	--	50.0	0	50.0	0		----	----	-----	----	"
			32.4	7	1	--	71.4	0	28.6	0		1870	1870	1860-1880	1860	"
T32				2238	137	30	16.8	4.1	78.3	.8	vh	1859	1870	1725-1910	----	---------
33	23	u	33.1	177	15	12	32.2	41.2	23.7	2.8	h	1790	1785	1770-1830	1790	Redeposited fill.
34	23	pt	34.1	460	3	5	46.4	32.3	20.4	.9		1810	1810	1790-1830	1790	Primary commercial. See text.
			34.2	1177	56	25	16.7	77.8	4.9	.5		1787	1785	1680-1850	1790	"
			34.3	26124	89	536	.8	98.5	.7	0		1810	1810	1750-1850	1790	"
			34.4	279	11	6	18.3	67.7	12.2	1.8		1791	1785	1750-1850	1790	"
			34.5	44	2	4	18.2	45.5	31.8	4.5		1772	1753	1740-1810	1770	"
T34				28084	161	576	2.4	96.2	1.3		n	1800	1753	1680-1850	----	---------
35	23	cb	35.1	146	39	10	19.2	39.0	13.7	14.4		1809	1810	1780-1830	1790	Redeposited material.
T35	23	cb		146	39	10	21.7	39.5	19.1	19.7	n	1809	1810	1780-1830	----	---------
36	23	bx	36.1	3022	215	131	8.8	66.3	24.8	.1		1799	1805	1760-1830	1790	Primary commercial glass deposit. See text.
			36.2	50	4	0	32.0	32.0	12.0	24.0		1810	1810	-----	1790	"
T36	23	bx		3072	219	131	8.4	66.6	24.9	0	n	1799	1810	1760-1830	----	---------
37	23	bl	37.1	174	66	5	1.7	39.7	58.6	0	n	1790	1790	1760-1820	1760	Primary commercial deposit within redeposited material. See text.
38	23	c	38.1	59	2	1	13.6	5.1	66.1	15.3		1810	1810	1790-1830	----	Redeposited material.
			38.2	40	3	1	47.5	2.5	32.5	17.5		1814	1810	1815-1830	1790	"
T38	23	c		99	5	2	27.3	4.0	52.5	16.2		1813	1810	1790-1830	1815	---------
39	23	bt	39.1	25	0	3	32.0	4.0	44.0	20.0		----	----	-----	----	Engineering fill.
40	23	u	40.1	136	2	3	14.6	13.9	69.3	2.2		1810	1810	1790-1830	1790	Redeposited fill.
			40.2	38	1	1	42.1	44.7	10.5	2.6		1800	1800	1750-1850	1750	Redeposited fill.
			40.3	95	2	2	23.2	67.4	9.5	0		1810	1810	1790-1830	1790	"
			40.9	20	0	0	10.0	20.0	65.0	5.0		----	----	-----	----	"
T40				289	5	6	21.2	37.2	40.1	1.5	h	1808	----	1750-1850	----	---------
41	22	p	41.1	7733	1784	219	30.0	53.4	14.6	2.1		1800	1798	1745-1850	1815	Primary commercial deposit. See text.
			41.2	248	3	20	49.2	23.8	25.0	2.0		1793	1810	1745-1830	1790	"
			41.9	106	35	3	39.6	.9	59.4			1778	1780	1680-1800	1760	"
T41				8087	1822	242	30.6	52.5	14.9	2.0	n	1800	1780	1680-1850	----	---------
42	21	p	42.1	286	1	2	34.3	2.1	61.5	2.1		1851	1851	1821-1880	1821	Redeposited material.
			42.2	1355	224	21	72.2	1.8	24.5	1.5		1841	1838	1755-1870	1845	"
			42.9	467	73	10	47.9	7.1	39.3	5.8		1782	1785	1750-1800	1770	"
T42				2108	298	33	65.6	1.9	31.0	1.6	n	1826	1785	1750-1880	----	---------
43	21	p	43.1	1346	123	10	30.4	3.3	61.9	4.5		1789	1785	1750-1840	1813	Redeposited fill.
			43.2	89	33	18	52.3	23.5	17.8	6.4		1755	1755	1725-1760	1745	Primary domestic.
			43.9	38	1	1	52.4	14.8	38.1	4.8		1810	1810	-----	1790	Redeposited fill.
T43				1473	157	29	42.6	14.1	38.3	5.1	s	1782	1810	1725-1840	----	---------

(continued)

GLASS TABLE 4.5 (continued)

Feat. #	Lot	Feat. Type	Feat. Level	Sherd #	Datable Sherd #	MNV	Sherd Types, by % KA	KB	KC	KD	Wear	Dates Mean*	Mode*	Bracketed Dates**	GTPQ	Comments
44	21	p	44.1	164	0	4	42.7	1.8	52.4	3.0		----	----	-----	----	Redeposited material.
			44.9	25	3	1	64.0		32.0	4.0		1790	1790	1760-1820	1760	Original landfill.
T44				189	3	5	42.7	1.8	52.4	3.0		1790	1790	1760-1820	----	---
45	21	a	45.1	91	6	1	9.9	1.1	89.0	0		1798	1798	1780-1815	1780	Redeposited fill.
46	21	a	46.1	125	0	1	31.2	8.0	57.6	3.2		----	----	-----	----	"
47	20	p	47.1	75	0	2	4.0	0	96.0	0		----	----	-----	----	Primary domestic deposit within redeposited material.
			47.2	608	49	9	19.7	3.3	77.0	0		1853	1853	1840-1865	1845	"
47	20	p	47.3	140	1	1	14.3	0	85.7	0		1853	1853	1840-1865	1840	"
T47				823	50	12	17.4	2.4	80.2	0	s	1853	1853	1840-1865	----	---
48	20	p	48.1	314	0	2	9.2	1.6	87.6	1.6		----	----	-----	----	Redeposited material.
			48.2	384	8	12	34.4	23.7	40.1	1.8		1770	1743	1725-1830	1790	"
			48.9	40	0	1	42.5	0	55.0	2.5		----	----	-----	----	Original landfill.
T48				738	8	15	24.1	13.0	61.1	1.8	h	1770	----	1725-1830	----	---
49	20	cb	49.1	2543	530	56	30.5	12.6	53.8	3.1		1796	1800	1750-1850	1790	Primary domestic.
			49.2	70	1-	6*	68.8	1.3	15.6	14.3		1793	1793	1780-1815	1780	"
			49.9	157	43	2	55.6	--	--	44.4		1796	1798	1680-1830	1790	"
T49				2770	574	64	31.5	12.4	52.7	3.4	h	1796	1798	1680-1850	----	---
50	19	p	50.1	215	16	127	53.5	14.9	29.3	2.3		1742	1700	1680-1815	1780	Primary domestic deposit within redeposited material.
			50.9	10	1	1	50.0	20.0	30.0			1743	1743	1725-1760	1725	Original landfill.
T50				225	17	128	53.3	15.1	29.3	2.2	h	1742	1743	1680-1815	----	---
51	18	p	51.1	532	72	22	41.0	13.3	31.2	14.5		1790	1798	1680-1815	1780	Primary domestic with redeposited material.
			51.2	106	24	3	41.5	3.8	45.3	9.4		1737	1700	1790-1830	1790	"
			51.9	4	0	0	25.0	--	50.0	25.0		----	----	-----	----	Original landfill.
T51				642	96	25	41.1	7.5	33.5	17.9	h	1777	----	1680-1830	----	---
52	18	bx	52.1	24	0	2	16.7	37.5	41.7	4.2		----	----	-----	----	Redeposited material.
			52.2	17	0	1	76.5	11.8	11.8			----	----	-----	----	"
			52.9	16	5	4	62.5	6.3	25.0	6.3		1795	1795	1770-1820	1770	"
T52				57	5	7	41.5	26.8	29.3	2.4		1795	1795	1770-1820	----	---
53	18	u	53.1	219	1	6	9.1	1.8	88.6	.5		1875	1875	1750-1850	1860	Redeposited material.
			53.2	1	0	0	100.0	--	--	--		----	----	-----	----	"
T53				220	1	6	9.5	1.8	88.2	.5	n	1875	1875	1750-1850	----	---
54	18	c	54.1	82	3	2	13.4	8.0	85.4	1.2		1785	1785	1770-1800	1770	Redeposited material.
54	18	c	54.2	11	1	1	18.2	9.1	54.5	18.2		1775	1775	1750-1800	1750	Original landfill.
T54				93	4	3	14.0	1.1	81.7	3.2		1783	1775	1750-1800	----	---
55	29/30	dt	55.1	346	173	8	82.7	1.7	15.6	0		1755	1755	1745-1765	1763	Original landfill.
			55.2	431	252	11	79.8	1.4	18.8	0		1753	1755	1700-1765	1763	"
			55.3	89	46	1	70.8	1.1	25.8	2.2		1755	1755	1745-1765	1745	"
			55.4	56	19	1	87.5	--	12.5	--		1755	1755	1745-1765	1745	"
T55				922	490	21	80.5	1.4	17.9	.2	h	1754	1755	1700-1765	----	---
56	29/30	dt	56.1	81	1	4	44.4	27.2	27.2	1.2	h	1810	1810	1790-1830	1790	Original landfill.
			56.2	148	0	5	60.1	.7	38.5	.7		----	----	-----	----	"
			56.3	21	0	0	52.4	4.8	42.9	0		----	----	-----	----	"
			56.4	26	0	0	61.5	7.7	30.8	0		----	----	-----	----	"
T56				276	1	9	55.1	9.4	34.8	.7	h	1810	----	1790-1830	----	---
57	33	bl	57.1	90	46	7	61.1	17.8	20.0	1.1	h	1801	1798	1780-1835	1780	Primary domestic.
			57.9	13	2	2	100.0	--	--	--		1790	1790	1770-1810	1770	Original landfill.

*Includes MNV from 49.3

(continued)

GLASS TABLE 4.5 (continued)

Notes on the Table:

1. The percentages of KA, KB, KC, and KD were based on sherd counts. The relative frequencies of these may vary by one or two tenths of a percentage point, due to changes and updates in the computer. For comparative or analytical purposes, these quantities should be rounded off to the nearest whole percentage point.
2. Mean and mode dates were run with .9's (landfill) and were based on sherd count.
3. Bracketed dates were run on MNV.

* Dates run by sherd count
**Dates run by MNV

Feature Types: p=privy; c=cistern; bt=builder's trench; d=drain; bl=barrel; pt=pit; cb=cofferdam/box; bx=box; a=architectural; dt=deeptest; u=unidentified; lf=living floor

Wear Patterns: h=very heavy; s=slight; w=waterworn/rolled; f=flawed/kiln damaged; n=none



Plate 4.1: Assorted bottles from Feature 41 dating from approximately 1789-1826. Back row, left to right: wine/liquor bottle, case bottle, pocket flask, wine/liquor bottle. Front row, left to right: chestnut flask, two pocket flasks, square medicine or mustard.

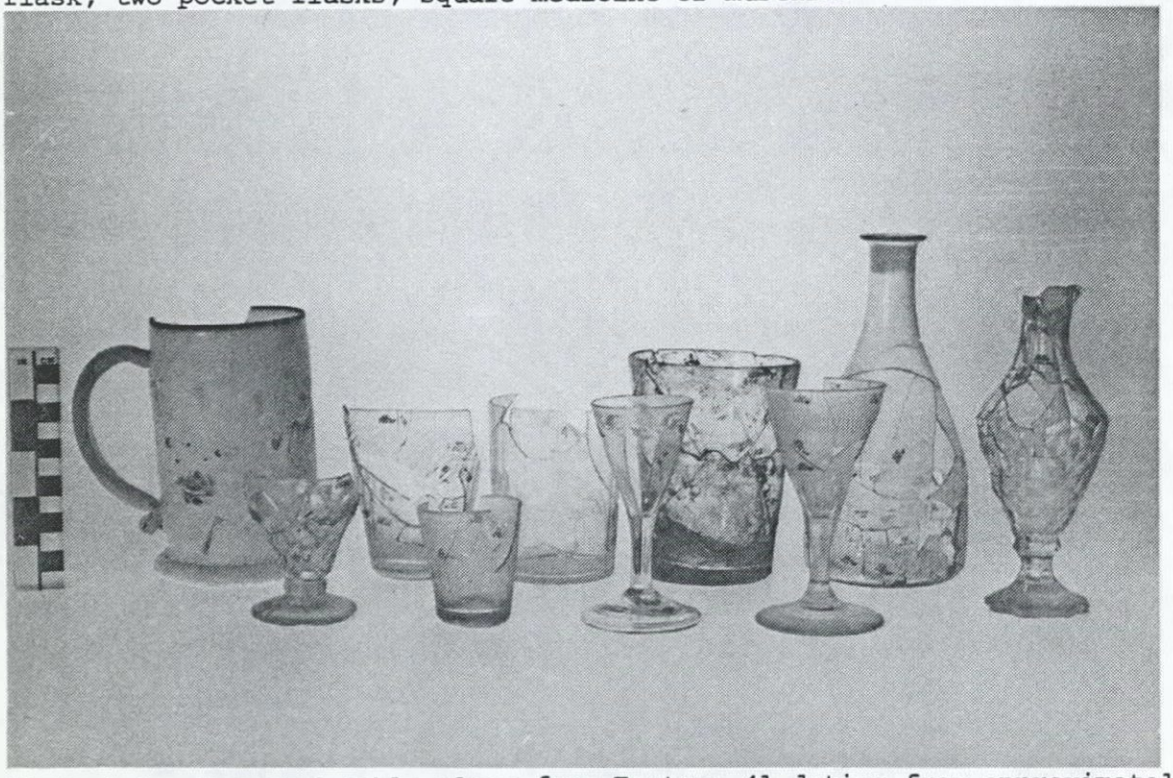


Plate 4.2: Assorted table glass from Feature 41 dating from approximately 1789-1826. Back row, left to right: milkglass tankard with cobalt trailed rim, pattern molded tumbler, cut glass tumbler or water glass, flip glass, decanter. Front row, left to right: salt cellar, shot glass, two wine glasses, cruet.



Plate 4.3: Assorted bottles from Feature 49 dating from approximately 1795-1820. Left to right: two wine/liquor bottles, case bottle, wine bottle, wine/liquor.



Plate 4.4: Assorted table and bottle glass from Feature 49 dating from approximately 1795-1820. Left to right: vial, barrel-shaped tumbler, inkstand, essence of peppermint bottle, vial, wine glass.



Plate 4.5: Assorted table and bottle glass from Feature 36 dating from approximately 1809. Back row, left to right: two wine bottles, wine/liquor, snuff. Front row, left to right: plain tumbler, engraved flip, plain tumbler, two vials.

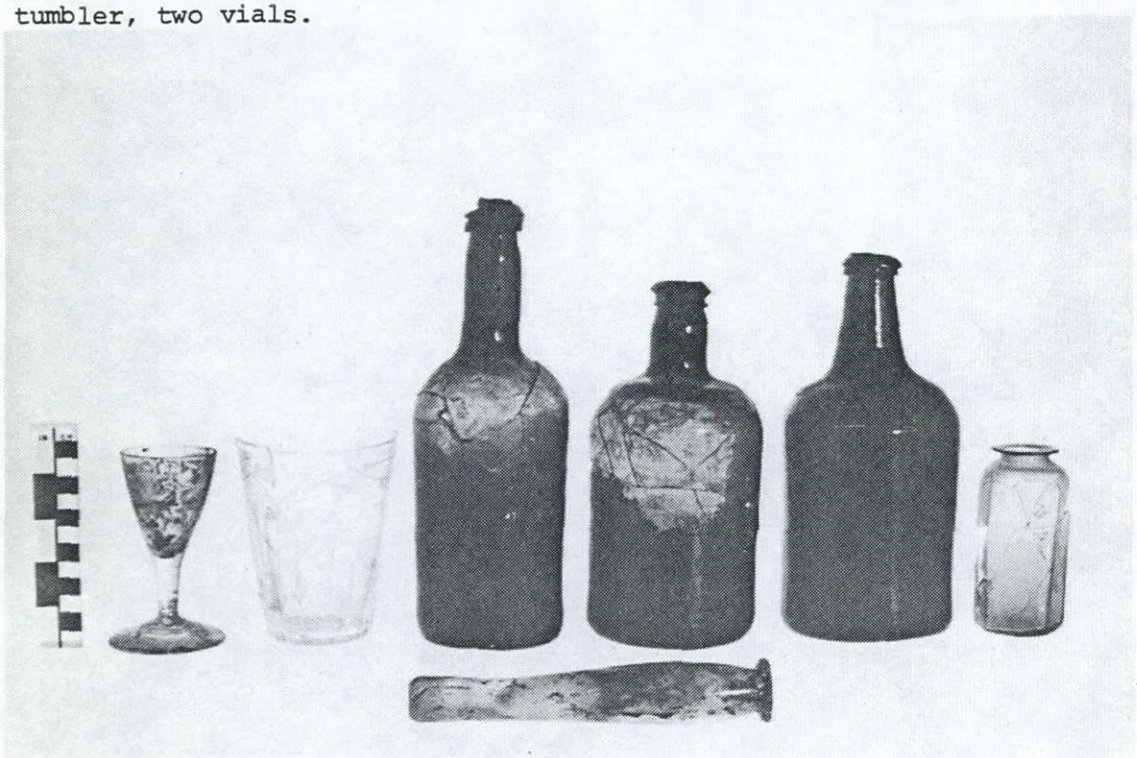


Plate 4.6: Assorted bottle and table glass from Feature 30, all post 1790. Back row, left to right: wine glass, engraved tumbler, three wine/liquor bottles, snuff. Front row: proof vial.



Plate 4.7: Assorted bottles from Feature 2 dating from approximately 1841-1880. Back row, left to right: beer bottle, medicine, unidentified bottle, chemical, master ink, unidentified bottle, two vials. Front row, left to right: two medicines, vial, medicine, three vials, medicine.

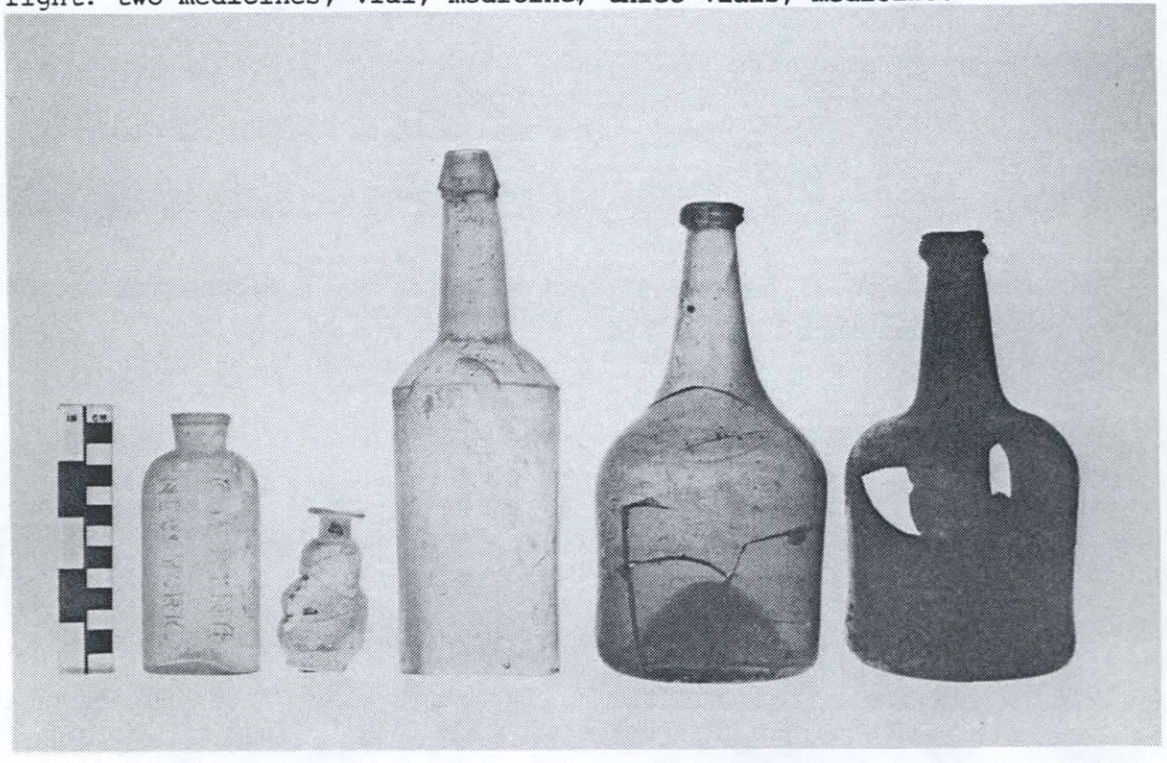


Plate 4.8: Miscellaneous bottles. Left to right: C.H. Ring New York; Turlingtons Balsam; P. Gordon, Vesey St. NY, two wine/liquor bottles.

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CERAMIC ANALYSIS
(Nancy A. Stehling)

Introduction

The following section is limited to the analysis of specific ceramic assemblages recovered during excavation of the 175 Water Street block. The first step toward ceramic analysis was the tabulation phase, the identification and count of the sherds and vessels by specific ware types. This phase was completed with the assistance of George J. Myers, Jr. and Jay R. Cohen. With minor changes, the coded typology used for the analysis was based on Noel Hume (1969) and South (1971, 1977). Ware type numbers 1-78, as defined by South, correspond to the typology used on the 175 Water Street Project. Ceramic ware types not in South's typology were also coded; nine of these were dated through sources other than Noel Hume and South. These ware types are WB81, Bristol Brown bottles (Munsey 1970); WN83, Turner's type molded stoneware (Godden 1975); WP81, underglaze painted porcelain, brown line on rim (Palmer 1976); WP82, underglaze blue painted porcelain, brown exterior (Palmer 1975); WW80, transfer printed whiteware (Lofstrom et al 1978); WW81, "flow" blue transfer printed whiteware (Lofstrom et al 1978); WY81, Midlands earthenware (Janowitz 1981: personal communication); WY84, American Rockingham (Spargo 1974); and WY86, yellow ware (Garrow 1982).

All additional ware codes are descriptive of either paste and glaze or paste and decoration. Most of these additional descriptive codes have been consistently used on New York City archaeological sites (Janowitz 1982; personal communication; Levin 1982: personal communication). A datable typology awaits further research.

Except where noted, cited dates were taken from South's typology and based on Noel Hume's (1969). South's terminal dates of 1775 were expanded in this analysis to 1779; the rationale for this change is based on the relation of the Revolutionary War to New York City trade patterns. Since New York City was British held, it is probable that European goods continued to be imported into the city even after the War began (see Rockman, et al. 1982).

A major goal of the ceramic analysis of the 175 Water Street site was to define the types of deposits found within the features. These definitions allowed statements to be made regarding the nature of past activities represented by these features.

Three major feature deposit types have been defined: primary commercial deposits, primary domestic deposits, and deposits such as redeposited fill material and original landfill. Primary deposits within a matrix of redeposited fill material were commonly found at the site.

Primary commercial deposits relate to business activities once in operation on the block. They are characterized by the following criteria: very dense artifact concentration; intact or nearly whole vessels; numerous mends and crossmends that mend to whole or almost whole vessels; large residual sherds yielding a high minimum number of vessels count (MNV); little or no evidence of wear attributable to use on vessel bases; and sets of vessels recognizable for both vessel form and decorative style.

Primary domestic deposits relate to the residential component of the block. The most definitive characteristic of these deposits is the presence of use-related wear patterns. Also characteristic are mends and crossmends creating partially whole vessels, again displaying varying stages of wear, a sitution not seen in primary commercial deposits. In addition, these deposits exhibited proportionately more residual sherds than did commercial deposits; they also yielded sherds and vessels representative of many functional categories of vessel forms.

Redeposited and original fill material is characterized by a very fragmented ceramic assemblage, few minor mends, few if any crossmends, a very low MNV count, and a wide variety of ceramic ware types.

In addition to defining the types of feature deposits, another important goal of ceramic analysis was to determine the chronological sequence of depositional episodes within features. These episodes, designated as levels within each feature, had been tentatively identified and dated based on field interpretation and soils evidence (see Chapter 3, Field Report). These levels were the basic unit of analysis used by the computer to generate deposit dates that either supported or redefined these episode definitions. Dating techniques employed during the analysis included South's mean ceramic date formula as well as modal and bracketed dates, all of which were generated by the computer.

Stanley South has demonstrated the accuracy of the mean ceramic formula as a dating tool for British-American sites that occur on naturally laid soil deposits (1972, 1977). The 175 Water Street site, however, is a landfill block incorporating soils that probably have been shifted and redeposited during land building, stabilization, and alterations. Most features appear to have been built directly into the landfill and, in most if not all features on the site, primary deposits occurred in a matrix of redeposited fill material. This redeposited material contained ceramics mainly dating from the mid- to late-eighteenth century. The primary deposits in association, however, appear to date from the late-eighteenth century to well into the nineteenth. The computed mean ceramic dates, therefore, reflect not only the primary deposit date but also some earlier activity of building or stabilization. Consequently, a more reliable tool for the interpretation of the chronological sequence of fill episodes within features on a landfill site is the principle of "terminus post quem" as discussed by Deetz: "The principle of dating (such) deposits on the basis of the newest artifact found in them is common to all archaeology . . . Known as the 'terminus post quem' (date after which), this kind of dating is powerful when combined with a detailed knowledge of the history and development of the artifacts in question." (Deetz 1977:16). Because deposits were mixed within analyzed features, the decision was made to use the beginning manufacture date of the newest ceramic type present as the date (CTPQ) after which deposition must have occurred. However, although this analysis depends on the ceramic terminus post quem (CTPQ) for dating deposits, mean, mode and bracketed dates are included in the data base. It should be noted that the mean date follows South (1977:213) in removing long-range dated ceramics, such as porcelain, from the analysis. For this analysis, general delft codes (WD49 and WD65) were also not included.

Other goals of the ceramic analysis concerned questions of trade networks and economics. Theoretically, ceramics analyses based on the country of origin can be used to study trade relationships. For this purpose, when known, the country of origin was coded. Questions regarding social status may also be addressed through ceramic analysis. The Miller Economic Scaling System (Miller 1980) provides a method of determining relative social status. The coding of the MNV by decoration and ware type as well as by vessel form primarily was done to organize the ceramic data for the application of the Miller Model.

Methods

The ceramics from the 175 Water Street site that received the most intensive analysis were those recovered through excavation of tentatively defined living surfaces and occupation related features as well as those related to building or alteration activities. In addition, two deeptest trenches spanning Lot 29/30 were also intensively analyzed because of the potential chronological information they offered. Occupation related features included ten privies, five cisterns, five wooden "boxes", and four barrels. Construction related features, including ten builder's trenches, also yielded a great deal of ceramic material as did a "pit" or yard deposit. In all, fifty-seven features were defined and their ceramics intensively analyzed.

The following section will present the laboratory methods involved in handling the large assemblages of feature ceramics recovered from the site; it will also present a discussion of the methods and techniques employed in tabulation and subsequent analysis of this material (see Ceramic Table 4.11).

Tabulation and Identification

The ceramic tabulation and identification process proceeded by catalogue number within a specific feature; one feature was completely tabulated before beginning another. In an effort to examine the entire feature assemblage as a whole, a crossmending process was applied to ceramics from each feature prior to tabulation. This procedure helped determine vessel forms as well as providing a basis to establish minimum vessel counts. Sources used during ceramic indentification include Barber (1967), Boger (1971), Camehl (1971), Cushion (1976), Garrow (1982), Godden (1964, 1972, and 1975), Janowitz (personal communication), Lewis (1969), Levin (personal communication), MacDonald-Taylor (1968), Noel Hume (1969 and 1977), Munsey (1970), Palmer (1976), Schiffer (1975), South (1972 and 1977), and Sparago (1974).

Mends and Crossmends

Ceramics were laid out on laboratory tables, grouped by catalogue number within a feature, and examined for mends and crossmends. "Mends" are vessels that were partially or totally reconstructed from the sherds of one catalogue number; "crossmends" are those vessels that were partially or totally reconstructed from two or more catalogues, and were therefore recovered from two or more levels. To facilitate the crossmending process, ceramics were laid out according to the stratigraphic sequence defined during excavation. Crossmends were useful analytic tools as they served to confirm or deny field-determined stratigraphic relationships.

All mends and crossmends were initially taped together to define a vessel's form and therefore its function (see Vessel Forms, this section). These vessel forms were obviously not readily seen in piles of sherds. Analysis of vessel forms within features can be useful in interpreting the nature of these deposits; that is, whether they reflect commercial or domestic activities (see Introduction, this section).

Once the crossmending process was completed, vessels were selected to be permanently glued. These vessels included those to be photographed as well as those that might be potential exhibit material. The mends and crossmends were stored in individual bags and grouped by feature.

A separate recording system was established for the mends and crossmends which were assigned arbitrary consecutive numbers by feature, each feature beginning with vessel number one. To facilitate subsequent analyses, these vessel numbers were coded on the computer form during tabulation. All crossmends, intact vessels, and mends comprising fifty percent or more of a vessel were assigned a vessel number. An index card file was created for each feature, with one numbered card corresponding to each numbered mend or crossmend. These cards recorded provenience information and the catalogue and accession numbers of each sherd as well as a brief description of the vessel. This card file, arranged by feature, was very useful during the tabulation phase, as it greatly reduced the hands-on time needed to tabulate the artifacts. The cards proved especially useful in tabulating the large assemblages recovered from some of the commercial deposits.

Computer Data Entry

As noted above, the tabulation and identification process of the feature ceramics was organized by catalogue number. Systematic tabulation was accomplished through the use of the ARDVARC computer system, employing an ARDVARC data entry sheet (see Figure 4.2). A total of ten fields of discrete data contained in forty-one columns were coded on these sheets. These are as follows: The specific ceramic ware code (four columns) (see Ceramic Table 4.4); beginning manfuacture date (three columns); end manufacture date (three columns); minimum nuber of vessels (MNV) (three columns); vessel form (two columns); vessel number (three columns); wear (one column); origin (two columns); and motif or pattern (two columns). Each form recorded all provenience data such as catalogue, lot, unit, locus, and level numbers. The specific ceramic code and count fields were always coded, while the remaining fields were coded when applicable. With the exception of the specific ceramic ware field, all data were entered numerically (see Ceramic Tables 4.12 through 4.16 for translations).

Ceramic Code

The ceramic ware code is alpha-numeric and comprises a two letter and two number system. The first letter from ceramic tabulation is always W, the general code for ceramics. The second letter represent the gross ware type; for example, WC is creamware. The double digit following the letters defines the specific ceramic ware type within the gross type. For example, WC22 is plain undecorated creamware (see Ceramic Table 4.12).

Dating

In order to compute mean ceramic dates, the beginning and end manufacture dates for datable ceramic ware types were included as part of the code translations (see Ceramic Table 4.12). It should be noted that the mean ceramic dates on this assemblage were computed for both sherds and MNV; for this analysis, however, following South (1972, 1977), only the sherd means were used. Only occasionally, when a sherd-specific date was provided, as in the event of a known maker's mark, was it necessary to write in dates on a line entry. These dates superceded those in the translation. The dates for delft tiles with datable decorative corner motifs were always entered during tabulation, as there were numerous date ranges possible.

MNV

Minimum number of vessel counts (MNV) were generated to aid subsequent analyses; for example, these MNV counts can be sub-divided and differentially interpreted: They can be looked at by ceramic ware type, by decoration, by vessel form, and by functional categories based on vessel forms.

Vessel counts were determined during the tabulation phase and coded in the MNV field. The sherds or vessels were first divided into specific ware types, then sorted by size-specific vessel forms, and then finally sorted by decorative motifs. A minimum number of one was assigned when fifty percent or more of a vessel base was present. This somewhat conservative method for determining minimum vessel counts was adopted because the size of the collection imposed time constraints on tabulation. It is recognized that this method provided only the most minimal vessel counts. Tabulation proceeded by catalogue number, and as seen in the number of crossmends, portions of vessels could be present in more than one catalogue and, therefore, level. This method of determining MNV, together with the crossmend procedure and card file, helped prevent a vessel from being counted more than once.

Vessel Form

Vessel form also was defined and coded during tabulation. In all, a total of sixty-one vessel forms were coded; these ranged from very general codes of flatware and hollow-ware to very specific codes, such as plates and bowls coded by diameter in inches (see Ceramic Table 4.13). The specific forms were based on function and were grouped for analytical purposes into broader functional categories, such as food service, food preparation and storage, personal hygiene, and essentially decorative pieces (see Ceramic Table 4.14). The general codes were used only when it was impossible to determine specifics. To facilitate future analyses not necessarily undertaken here, codes for plates and bowls were based on size as well as decoration and ware types.

Wear

Wear or use marks were coded when noted. Four applicable codes were defined: very heavy wear, slight wear, waterworn or rolled, and flawed or kiln damaged. The presence or absence of wear marks is a very important consideration in interpreting deposits, with the assumption that heavy wear indicates domestic use and little or no wear suggests a store-related or similar commercial deposit (see Ceramic Table 4.15).

Origin

When known, the country of origin was also coded. It is difficult to determine the country of origin of unmarked vessels, but it has been generally assumed that most of the finer wares produced during the second half of the eighteenth century through the first quarter of the nineteenth century are of English origin. "In the second half of the eighteenth century, a revolution took place in the English ceramic industry . . .and astute marketing of creamware . . .culminated in English domination of world ceramic tableware trade by the 1790s" (Miller 1980:1).

For the purpose of this analysis, it has been assumed that all creamware, refined stoneware--such as white saltglazed, black basaltes and Elers type--and buff bodied slipware are of English origin (see Glass Table 4.4 for origin codes).

Motif/Pattern

The final data field on the computer sheet was that of pattern or motif. The first four codes of a possible twelve refer to general stylistic patterns such as floral, geometric, landscape, and chinoiserie. The broad patterns were coded to distinguish handpainted and transfer printed styles for the purpose of establishing minimum vessel counts. The remaining eight codes evolved during tabulation and refer to elements that are not included in the specific ceramic codes (see Ceramic Table 4.16).

Photographic Plates

While the photographic plates accompanying this section are primarily meant to illustrate vessel forms, they also illustrate ware type and decoration.

FEATURES

Of the fifty-seven identified features from 175 Water Street, twenty-eight will be discussed here in detail; for a complete list of features relative to this analysis, the reader is referred to Ceramic Table 4.11.

Feature 1

Feature 1 was a rectangular brick cistern located in Lot 36 Unit 1. Based on the field interpretation, this feature was divided into three levels (1.1, 1.2, and 1.9). The ceramic analysis does not contradict this subdivision; 1.1 and 1.2 represent probable episodes or redeposited fill, and 1.9 is most likely original landfill.

The mean ceramic date of 1821 for 1.1 is based on 119 dated sherds of 239 recovered (50%). The modal date is 1815 and the bracketed date is 1650-1900. The major percentage breakdown is as follows: porcelain, 58.2%; whiteware, 18.8%; pearlware, 8.8.%; redware, 3.8%; and creamware, 2.5%. Sherds of brown stoneware, delftware, white bodied earthenware, gray stoneware, and white salt-glazed stoneware were also recovered. There was one crossmend noted in this level, a 10-inch Canton porcelain plate (see Plate 4.12). The MNV count is 11 and comprised of portions of 9 hollow-ware porcelain vessels, a 10 inch plate, and a white salt-glazed stoneware teapot. The remaining sherds were very fragmented suggesting this level is probably redeposited fill. The terminus post quem for this deposit is 1844 and is based on the presence of "flow" blue transfer printed whiteware.

The mean ceramic date of 1765 for 1.2 is based on 18 dated sherds of 32 recovered (56%). The modal date is 1733 and the bracketed date is 1660-1860. Buff bodied slipware (18.8%), porcelain (18.8%), redware (12.5%), and gray stoneware (12.5%) predominate. Creamware, pearlware, delftware, and whiteware were also recovered. There were no mends or crossmends noted in this level. The MNV is 1. This deposit, too, appears to be redeposited fill. Based on transfer printed whiteware, it is dated post-1830 (CTPQ). This level may be part of the post-1844 redeposition of 1.1, but the sample is too small to be conclusive.

The mean ceramic date of 1740 for 1.9 is based on 11 dated sherds of 39 recovered (39%). The modal date is 1733, and the bracketed date is 1670-1860. Gray stoneware (43.6%), buff bodied slipware (17.9%), and porcelain (12.8%) predominate. No creamware, pearlware, or whiteware was recovered. This level is probably original landfill into which this cistern was constructed, but the sample is too small to be conclusive.

Feature 2

Feature 2 was a round stone privy located in Lot 33 Units 5 and 7. Based on the field interpretation and soils evidence, this feature was divided into three levels. The ceramic analysis supports this division: 2.1 represents redeposited fill; 2.2 is redeposited fill containing probable domestic refuse; and 2.9 represents original landfill as tentatively defined during field excavation.

The mean ceramic date of 1793 for 2.1 is based on 181 dated sherds of 248 recovered (73%). The modal date is 1791, indicating the high percentage of creamware present, and the bracketed date is 1670-1900. The major percentage breakdown is as follows: creamware, 37.5%; pearlware, 24.2%, delftware, 8.9%; porcelain, 6.05; white salt-glazed stoneware, 5.6%; buff bodied slipware, 4.8%; and redware, 4.0%. Sherds of brown stoneware, gray stoneware, and other non salt-glazed stoneware were also recovered. There were no mends or crossmends noted in this level; it was not possible to determine MNV, as this assemblage was very fragmented. Based on the presence of brown stoneware bottle sherds, this redeposited fill episode is dated post-1820 (CTPQ); however, an 1865 Indian Head cent recovered from this level, coupled with the glass evidence, provides a later, more likely, terminus post quem (see Glass, this chapter).

The mean ceramic date of 1775 for 2.2 is based on 157 dated sherds of 528 recovered (49%). The modal date is 1791, and the bracketed date is 1670-1900. The major percentage breakdown is as follows: delftware, 30.7%; creamware, 18.8%; redware, 10.0%; buff bodied slipware, 9.5%; white salt-glazed stoneware, 9.1%; pearlware, 7.8%; and porcelain, 7.2%. Sherds of brown stoneware, white bodied earthenware, pink/white bodied slipware, other non salt-glazed stoneware, and red bodied slipware were also recovered. The MNV count, which includes two crossmends, is 6. Noted vessels were a 7 inch shell edged pearlware plate, an undecorated pearlware ointment jar, a 10 inch creamware plate, a delft bowl, and flatware of transfer printed pearlware and white salt-glazed stoneware. Slight wear was noted on some of these vessels which possibly represent domestic refuse in the redeposited fill. The presence of brown stoneware bottle sherds dates this episode as post-1820 (CTPQ); based on the date from 2.1, it probably pre-dates 1865.

The mean ceramic date of 1748 for 2.9 is based on 30 dated sherds of 90 recovered (33%). The modal date is 1733, which indicates a high percentage of buff bodied slipware, and the bracketed date is 1660-1820. Six ware types predominate in this level; gray stoneware, 23.4%; buff bodied slipware, 20%; delftware, 15.6%; redware, 12.2%; porcelain, 10%; and white salt-glazed stoneware, 10%. A sherd each of creamware, white bodied earthenware, pink/white bodied slipware, other non salt-glazed stoneware, and yellow bodied earthenware and two sherds of red bodied slipware were also recovered. No sherds of pearlware or whiteware were recovered.

This assemblage was very fragmented; the MNV count is 1. The only vessel form noted, an underglaze blue painted hard paste porcelain six inch bowl, was a cross feature mend to Feature 57, the barrel to the southeast of Feature 2. This level appears to be original landfill into which this privy was constructed. Based on the presence of one sherd of creamware, the CTPQ is 1762.

Feature 3

Feature 3 was a round wooden cistern located in Lot 33 Unit 1. Based on the field evidence, the deposits were divided into three levels (3.1, 3.2, and 3.9), the lowest being tentatively defined as original landfill. The ceramic analysis does not contradict the level divisions, but suggests the three are redeposited fill episodes.

The mean ceramic date of 1781 for 3.1 is based on 204 dated sherds of 356 recovered (57%). The modal date is 1791 and the bracketed date is 1670-1922. Five ware types predominate: creamware, 28.1%; porcelain, 14%, delftware, 13.8; redware, 13.5%; and buff bodied slipware, 9.3%. Sherds of salmon bodied earthenware, brown stoneware, pearlware, white bodied earthenware, pink/white bodied slipware, gray stoneware, other non salt-glazed stoneware, red bodied slipware, white salt-glazed stoneware, and yellow bodied earthenware were also recovered. This deposit was very fragmented; there were no mends or crossmends noted. The MNV count is for all identified forms: a creamware bowl, a majolica plate, a porcelain platter, and a red bodied slipware serving dish. Based on the presence of Canton/ Nanking porcelain, this redeposited fill level is dated post-1800 (CTPQ).

The mean date of 1770 for 3.2 is based on 100 dated sherds of 260 recovered (38%). The modal date is 1791 and the bracketed date is 1660-1860. The highest percentages are as follows: brown stoneware, 24.2%; creamware, 18.5%; red bodied slipware, 11.5%; and buff bodied slipware, 7.7%. Delftware, pearlware, pink/white bodied slipware, gray stoneware, porcelain, redware, white salt-glazed stoneware and yellow bodied earthenware were also recovered. This deposit was very fragmented. The MNV count is 2, a brown stoneware jug and a red bodied slipware serving dish; both were mends. No crossmends were noted. Based on the presence of underglaze polychrome pearlware, this redeposited fill level post-dates 1795.

The mean ceramic date of 1771 for 3.9 is based on 196 dated sherds of 402 recovered (49%). The modal date is 1791, which indicates a high percentage of creamware, and the bracketed date is 1670-1860. The highest percentages are as follows: creamware, 26.1%; redware, 18.4%; delftware, 13.2%; white salt-glazed stoneware, 10.7%; porcelain, 10.2%; and gray stoneware, 9.5. Also recovered were sherds of brown stoneware, pearlware, pink/white bodied slipware, other non salt-glazed stoneware, red bodied slipware, and buff bodied slipware. There were two partial mends in this level, a blue decorated gray stoneware chamber pot and a Buckley ware storage vessel. The MNV count was 10. In addition to the mends, portions of two delftware bowls, a porcelain tea bowl, and holloware vessels of Jackfield ware, and redware and white salt-glazed stoneware were also recovered. The remainder of the ceramics were highly fragmented. Although this level was tentatively defined as original landfill, it is probably a level of redeposited fill. Based on the presence of underglaze blue painted pearlware, this redeposition is dated post-1780 (CTPQ).

Levels 3.1, 3.2, and 3.9 may represent one episode of redeposition post-dating 1800, or each may represent a discrete episode of redeposition of earlier fill material into this feature (see Plate 4.39).

Feature 4

Feature 4 was a square stone cistern located in Lot 33 of Unit 4. While only a 25 percent sample of this feature was screened (see Chapter 3, Lot 33) diagnostic artifacts recovered outside the sample were collected and bagged. These "unsampled" artifacts remain as part of the collection, but were not tabulated and are not a statistical component of the analysis. The sample size considered here makes it difficult to conclusively interpret the nature of the deposit.

Feature 4 was divided into three levels based on the field evidence, but the ceramic analysis suggests it contained one mid-nineteenth-century episode of redeposited fill; therefore, levels 4.1, 4.2, and 4.3 will be discussed together.

The mean ceramic date of 1775 for this feature is based on 189 dated sherds of 316 recovered from the sample (60%). The modal date is 1791, indicating a high percentage of creamware, and the bracketed date is 1670-1860. The major percentage breakdown by ware type is as follows: creamware, 22.8%; white salt-glazed stoneware, 15.2%; delftware, 14.6%; redware, 13.9%; porcelain, 8.9%; pearlware, 8.2%; and buff bodied slipware, 8.2%. Sherds of brown stoneware, pink/white bodied slipware, gray stoneware, other non salt-glazed stoneware, and red bodied slipware were also recovered. The sampled ceramics were very fragmented; and neither crossmends were noted in this feature. The MNV count is 8. Based on the presence of Canton/Nanking porcelain in the sample, a deposition date for this feature is post-1800 (CTPQ).

The provenience "unsampled" bags from this feature were examined for diagnostic material to aid in dating of the feature deposit. A brown stoneware flask was recovered outside the sample in the deepest excavated level. This flask, impressed "J BOURNE PATENTEE, DENBY AND CODNOR PARK POTTERIES, DERBYSHIRE/WARRANTED NOT TO ABSORB/VITREOUS STONE BOTTLES", provides an 1833-1861 date (Godden 1971:168-170, 1964:89-90) for the deposit.

Although the sample size is limited, it appears that this cistern was filled with redeposited material during the mid-nineteenth century. The glass data support a mid-nineteenth-century date as well (see Glass section, this chapter).

Feature 27

Based on field interpretation, Feature 27 was a tentatively defined occupation-related living floor that extended across Units 1-4 in Lot 33. A total of 960 sherds were recovered within a matrix of dark grey silty sand; this feature appears to represent sheet refuse mixed with redeposited fill material.

The mean ceramic date of 1788 for this feature is based on 661 dated sherds (69%); the modal date is 1791, and the bracketed date is 1670-1900. Five ware types predominate in the sherd assemblage: creamware, 44.7%; redware, 19.2%; pearlware, 13.7%; porcelain, 5.4%; and white salt-glazed stoneware, delftware, pink/white bodied slipware, gray stoneware, other non

salt-glazed stoneware, red bodied slipware, buff bodied slipware, and yellow bodied earthenware. The terminus post quem for this feature is 1790 and is based on finger painted creamware and annular pearlware.

In this deposit, there were 26 mends and 2 crossmends across units producing only partial vessels. Recognizable forms of all functional categories of vessels were present; they included portions of creamware plates, bowls, and a ladle; a pearlware tea pot; large delft bowls; a gray stoneware chamber pot; and a redware flower pot. The deposit, however, was very fragmented and it was not possible to determine the presence or absence of wear patterns, the primary criterion in defining household-related deposits. This feature may represent a living floor based on the field evidence; however, the ceramic evidence is not sufficient to draw definite conclusions. No differences were determined through the ceramic analysis to distinguish this deposit from other redeposited fill.

Feature 28

Based on field interpretation, Feature 28 was a tentatively defined occupation-related living floor that extended across Units 1, 2, 3, 4, and 9 in Lot 33. A total of 407 sherds were recovered within a matrix of orange sand. Based on the ceramic evidence, this deposit seems to be redeposited fill.

The mean ceramic date of 1769 for this non-structural "feature" is based on 260 dated sherds (64%); the modal date is 1791, and the bracketed date is 1660-1860. Four ware types predominate the ceramic assemblage: creamware, 27.8%; white salt-glazed stoneware, 17.7%; redware, 16.7%; and delftware, 10.1%. Minor percentages of brown stoneware, pearlware, white bodied earthenware, gray stoneware, other non salt-glazed stoneware, porcelain, red bodied slipware, buff bodied slipware, and yellow bodied earthenware were also recovered. The terminus post quem for the deposit is 1780, and is based on underglaze blue painted and shell edged pearlware.

The base of a white salt-glazed stoneware vessel was the only mend noted. Portions of vessels were recognizable and included creamware bowls and a plate, a pearlware plate, a Jackfield bowl, a buff bodied slipware posset type drinking cup, and white salt-glazed stoneware bowls. As was found with Feature 27, another possible living floor, this deposit was very fragmented. It was not possible to determine wear patterns as the vessels noted were incomplete. No difference was found through the ceramic analysis to distinguish this deposit from other redeposited fill.

Feature 30

Feature 30 was a rectangular wooden box located in Lot 32 Unit 2. Based on the field evidence, this feature was divided into four levels (30.1, 30.2, 30.3 and 30.4); the ceramic analysis, however, suggests only three: 30.1 and 30.2 together represent a primary domestic deposit in a matrix of redeposited fill; 30.3 is most likely a redeposited fill episode including a transition to landfill; and 30.4 is possibly a transition to landfill below the confines of the box.

A mean ceramic date of 1798 for 30.1 is based on 935 dated sherds of 1,202 recovered (78%). The modal date is 1791, indicative of the high percentage of creamware, and the bracketed date is 1650-1900. Three ware types predominate: pearlware, 40.6%: creamware, 31.1%; and redware, 11.4%. Also recovered were sherds of brown stoneware, porcelain, white salt-glazed stoneware, and buff bodied slipware.

The mean ceramic date for 30.2 is 1792, based on 241 dated sherds of 301 recovered (80%). The modal date is 1791, and the bracketed date is 1670-1860. Four ware types predominate: creamware, 31.9%; pearlware, 31.2%; brown stoneware, 10.6%; and redware, 7.6%.

The catalogue numbers from 30.1 and 30.2 crossmend, suggesting these levels represent one episode of deposition. There were 3 mends and 5 crossmends noted. The MNV Count is 3: a large brown stoneware jug, an annular decorated pearlware pitcher, and a transfer printed creamware pitcher (see Plate 4.23). Additional mends and crossmends include a transfer printed pearlware saucer and 9 inch plate, an underglaze polychrome pearlware bowl, and an undecorated creamware bowl. Wear marks are present on some of these vessels, suggesting this deposit contains an element of domestic refuse. Based on the presence of transfer printed and underglaze polychrome pearlware, this deposit is dated post-1795 (CTPQ).

The mean ceramic date of 1757 for 30.3 is based on 85 dated sherds of 125 recovered (68%). The modal date is 1733, indicative of the high percentage of buff bodied slipware and the bracketed date is 1670-1860. Three ware types predominate: white salt-glazed stoneware, 34.4%; buff bodied slipware, 18.4%; and porcelain, 11.2%. Creamware, delftware, pearlware, gray stoneware, and redware were also recovered. This level was very fragmented making it impossible to determine a MNV count as defined for this analysis. There were no mends or crossmends noted. This deposit is most likely redeposited fill dated post-1780 based on the presence of undecorated pearlware (CTPQ).

The mean ceramic date of 1762 for 30.4 is based on 86 dated sherds of 124 recovered (69%). The modal date is 1780, and the bracketed date is 1670-1860. Four ware types predominate: white salt-glazed stoneware, 26.6%; porcelain, 23.4%; buff bodied slipware, 12.1%; and redware, 11.3%. Also recovered were sherds of brown stoneware, creamware, delftware, gray stoneware, and red bodied slipware. No pearlware was recovered. The terminus post quem for this level is 1759 because of the presence of green glazed cream bodied earthenware. The MNV count is 2, both decorated delftware vessels. This level is most likely original landfill.

Feature 31

Feature 31 was a wooden barrel located in Lot 30 Unit 1. Based on the field evidence, this feature was divided into two levels. The ceramic analysis, however, suggests it represents one episode of redeposited fill mixed with domestic refuse.

The mean ceramic date of 1752 for Feature 31 is based on 170 dated sherds of 203 recovered (84%). The modal date is 1755 and the bracketed date is 1670-1830. Almost exclusively, this feature contained mid- to late-eighteenth century material. Three ware types predominate: brown stoneware, 31%, white salt-glazed stoneware, 24.6%; and buff bodied slipware, 22.7%. Also recovered were creamware, delftware, 1 sherd of pearlware, gray stoneware, porcelain, redware, and yellow bodied earthenware.

There were four mends and one crossmend noted which represent a MNV count of 5. A Nottingham stoneware pitcher, a buff bodied slipware chamber pot, a scratch blue stoneware low bowl, and a tea bowl and chamber pot of white salt-glazed stoneware were noted (see Plate 4.40). These partial vessels displayed wear and possibly represent domestic refuse.

The newest ceramic present was one sherd of undecorated pearlware which dates post-1780. Based on the glass data (see Glass section, this chapter), however, the redeposition most likely post-dates 1790. In this instance, a more intensive stratum-specific analysis may support a mid-eighteenth century deposition date. The element of domestic refuse may actually represent a small primary domestic deposit dating to the mid-eighteenth century.

Feature 32

Feature 32 is a stone privy located in Lot 23 Unit 5. Based on the field interpretation and soils evidence, this feature was divided into four levels. The ceramic analysis, however, suggests the deposit was one episode of redeposited fill material; this assessment is based on nineteen crossmends noted between levels. Cross-feature mends between this privy and Feature 33, the unidentified stone feature in Lot 33 Unit 5, and the "pit" or yard deposit in Lot 23 Unit 4, were also noted.

The mean ceramic dates computed for levels 1-4 are 1778, 1763, 1779, and 1798 respectively. These dates reflect the redeposited fill material. There is a primary deposit in this feature of wine and snuff bottles dated 1860-1880, with no ceramics in association (see Glass chapter).

The mean ceramic date computed for this feature is 1766; this date is based on 459 dated sherds from 1,606 recovered (29%). The modal date is 1763 and the bracketed date is 1660-1840. Pink/white bodied slipware of various decorative patterns representd 53.1% of this assemblage. The remaining major percentage breakdown is as follows: 11.6% white salt-glazed stoneware, 8.3% delftware, 6.1% creamware, 4.8% buff bodied slipware, 3.9% redware, and 3.5% pearlware. Few sherds of brown stoneware, white bodied earthenware, gray stoneware, other non salt-glazed stoneware, porcelain, red bodied slipware, and yellow bodied earthenware, were recovered.

Nineteen crossmends were noted, primarily 12-14 inch diameter serving dishes and 10 inch diameter white salt-glazed stoneware plates. The MNV count is 38, with serving dishes and platters of pink/white bodied slipware predominant. Redware, delftware, buff bodied slipware, and white salt-glazed stoneware vessels were also noted.

A delftware bowl and a buff slipware cup from this privy crossmended to the unidentified stone feature also in Lot 23 Unit 5. The explanation for this cross-feature mending probably relates to the fact that the construction of Feature 32 disturbed the stone feature, Feature 33.

Two buff bodied slipware plates from this privy crossmend to the "pit" or yard deposit, Feature 34. These mends suggest that the privy was built into the yard deposit. An alternate explanation is that part of the primary deposit from Feature 34 was used to fill this stone privy during the nineteenth century.

Based on the ceramic evidence, this feature deposit post-dates 1795; this assessment is based on the presence of underglaze polychrome pearlware in all levels. The glass evidence, however, dates this feature to approximately 1860. The redeposition seen in the ceramic material could have been related to a deposit of glass from a commercial establishment (see Glass, this chapter).

Feature 33

Feature 33 is an unidentified stone feature located in Lot 23 Unit 5. This feature was most likely disturbed and partially destroyed by the construction of the stone privy, Feature 32, also located in Lot 23 Unit 5. The deposit within this feature represents redeposited material, perhaps disturbed original landfill.

The mean ceramic date of 1757 for this feature is based on 159 dated sherds of 327 recovered (49%). The modal date is 1763 and the bracketed date is 1670-1820. Three ware types are predominant: white salt-glazed stoneware, 31.2%; delftware, 24.8%; and buff bodied slipware, 10.4%. Redware, other non salt-glazed stoneware, porcelain, gray stoneware, creamware, salmon bodied earthenware, brown stoneware, pink/white bodied slipware, and red bodied slipware were also recovered.

The ceramic deposit was very fragmented. The MNV count is 9 based on portions of three delftware bowls, two redware bowls, and a tea bowl and three hollow-ware vessels of white salt-glazed stoneware. There were no mends or crossmends within the deposit, but there were two cross feature mends to the stone privy, Feature 32. Based on the field interpretation (see *Field Report*, Lot 23) and the cross feature mends, it appears that construction of the stone privy destroyed part of this feature.

Based soley on the ceramic evidence -- the very low percentage of creamware and the total lack of pearlware -- this deposit appears to pre-date 1780; the ceramic terminum post quem is 1762. Through the glass date however, this deposit is dated post-1790 (see Glass section this chapter).

Feature 34

Feature 34 was a "pit" or yard deposit located in Lot 23 Unit 4. This feature produced 12,357 sherds, the largest concentration of ceramics recovered from the site. This represented 29.3% of the combined feature assemblage and 13.8% of the entire site assemblage. Based on the field interpretation and soils evidence, this feature was divided into five levels. However, the ceramic analysis suggests this was a one episode primary commercial deposit mixed with some redeposited fill material as it crossmends across all five tentatively defined levels.

The mean ceramic date of 1748 for this feature is based on 6,921 dated sherds (56%). The modal date is 1733, which is indicative of the large percentage of dated buff bodied slipware present. The bracketed date is 1650-1860. This feature produced the highest percentage and most diverse array of decorative syles of slipware from a single site deposit. Buff bodied slipware and pink/white bodied slipware comprise over half of the feature assemblage. The percentage breakdown by gross ware type is as follows: pink/white bodied slipware, 31.3%; buff bodied slipware, 24.5%; white salt-glazed stoneware, 16.7%; delftware, 8.8%; creamware, 6.6%; white bodied earthenware, 5.9%; redware, 4.6%; brown stoneware, 2.4%; pearlware, 0.8%; gray stoneware, 0.8%; porcelain, 0.8%; and other non salt-glazed stoneware, 0.3%.

This primary deposit was highly mendable; there were 91 crossmends, 27 mends, 5 cross feature mends, and 4 feature to non-feature mends noted. The MNV count is 382 (the highest noted from the site), indicating that there were numerous large residual sherds in addition to mends and crossmends. 261 vessels were identified to size-specific forms (see Ceramic Table 4.6 for a breakdown). Most of the mends and crossmends form nearly whole or whole vessels. Very few vessels displayed any sign of wear attributable to use; no slipware vessels displayed wear. This feature meets all criteria as defined above for a primary commercial deposit.

The dating of this feature is based on the presence of pearlware in all five tentatively defined levels. Based on the presence of underglaze polychrome painted pearlware in the lowest of these levels, deposition is dated post-1795 (CTPQ). The glass data support this very late-eighteenth-century date (see Glass section, this chapter).

The total size-specific vessel assemblage of this commercial deposit appears by ceramic ware type in Ceramic Table 4.6. Three ware types predominate: pink/white bodied slipware, 36%; white salt-glazed stoneware, 21%; and buff bodied slipware, 16%. Four vessel forms, all of slipware, predominate: 12-14 inch serving dishes (51 pink/white bodied, 5 buff bodied); 7 inch low bowls (21 buff bodied); and platters (14 pink/white bodied). Many decorative patterns occur on these slipware vessels (see Plates 4.11 and 4.12). The specific ceramic codes for all slip decorated wares were based on various decorative patterns (see Ceramic Appendix 3, for ceramic codes and translations).

Ceramic Table 4.6 175 WATER STREET: Specific Vessel Forms Identified from Feature 34, the "Pit" in Lot 23

	PINK/WHITE BODIED SLIPWARE	BUFF BODIED SLIPWARE	WHITE SALT GLAZED STONEWARE	SCRATCH BLUE STONEWARE	CLOUDED/ MOTTLED GLAZE CREAMWARE	CREAMWARE	DELFT-WARE	UNDERGLAZE PAINTED PORCELAIN	GRAY STONEWARE	RED BODIED SLIPWARE	JACK-FIELD	NOTTINGHAM STONEWARE	REDWARE W
PLATTER	14							2					
SERVING DISH	51	5								1			
PLATE 10"			6			1							
PLATE 9"		2	7				1						
PLATE 7"			1										
PLATE no spec			3										
LOW BOWL 7"	28	14											
BOWL over 6"							5						
BOWL 6"					1								
BOWL 5"			4								1		1
BOWL 4"			9										
BOWL under 4"			2										
BOWL no specs		1	7		3		8				3	1	
TEACUP no hndl			6			3	3						
TEABOWL/CUP			8					1					
CUP no specs					1								
MUG			1										1
TEAPOT				2	9								
CHAMBER POT							2						3
TANKARD			1									7	
PITCHER					2							1	
POSSET TYPE		21											
SAUCER				1				3					
JUG									2				
STORAGE JAR									1				

Several slip-decorated vessels and base sherds in this commercial deposit display molded initials in relief on their interiors which may represent maker's marks. Initials noted were "S M", "M" within a circle, "S" only, and "G". "S M" may be the mark of one Samuel Malkin, a "slipware potter at Burslem, Staffordshire (fl. 1710-1730); pieces usually signed on the face are known with dates of 1712 and 1726; "S.M." (MacDonald-Taylor) 1962:240). "Samuel Malkin, Knowle Works, Burslem Staffordshire Potteries - Early Eighteenth Century slip decorated earthenwares . . .a series of circular moulded and slip decorated dishes bear the initials conspicuously worked into the design; one example is signed in full" (Godden 1964:410-411). "M" and "S" may also represent marks attributable to Sameul Malkin, but this has not been determined; "G" is as yet an unknown mark (see Plates 4.9 and 4.10).

The slipware vessels attributable to Malkin date to the early-eighteenth century; they may represent a shipment of old goods to the Colonies, or may have been warehoused elsewhere in New York City prior to land-making activity on the block.

Five delftware vessels are marked by their decorative motifs. "Pitt & Liberty" appears in underglaze blue script on the interior of four hollow-ware vessels. These vessels probably refer to William Pitt Chatham (1708-1778), who was secretary of state of Great Britain during the Seven Years War (1756-1763). Since he believed in "imperial power with constitutional liberty" for the colonies, Pitt was opposed to the Stamp Act of 1766 (Encyclopedia Brittanica 1964 Vol 5:344). "More 1 . . ." appears in underglaze blue script on a hollow-ware base sherd. This mark unfortunately does not aid in the dating of the deposit (see Plates 4.33 and 4.36 for additional vessels from this deposit).

Feature 35

Feature 35 was a large wooden "box" located in Lot 23 Unit 4. Based on the field interpretation, this feature was divided into two levels, 35.1 and 35.2, however, the ceramic analysis suggests that the material within this "box" represents one episode of redeposited fill.

The mean ceramic date of 1792 for this feature is based on 1,204 dated sherds of 1,325 recovered (91%). The modal date is 1805, and the bracketed date is 1670-1830. Creamware (39.5%) and pearlware (44.5%) predominate in this assemblage. Also present in smaller percentages are brown stoneware, delftware, white bodied earthenware, gray stoneware, porcelain, redware, red bodied slipware, white salt-glazed stoneware, and buff bodied slipware. One crossmend, a decorated delft bowl was noted in this feature. There were three cross feature mends between this assemblage and the "pit", Feature 34: two slipware vessels and one creamware bowl.

The MNV count of 73 was derived from tabulation of the individual sherds. Identified vessels were predominantly creamware and pearlware, consistent with the overall sherd percentages. Identified vessels included forty-five underglaze polychrome pearlware cups, tea bowls, bowls, and plates; fifteen undecorated creamware cups, bowls, plates, and platters; four plates of underglaze blue painted pearlware; one transfer printed pearlware cup; one plain pearlware plate; one engine-turned stoneware teapot; two Nottingham stoneware vessels; and one scratch blue stoneware vessel.

The fragmented condition of the assemblage, and the lack of mendable vessels, suggest that this feature deposit is redeposited fill. No wear marks attributable to use were noted.

The ceramics within this "box" crossmend to the primary commercial deposit of Feature 34. There are two explanations offered. The first is that this box was constructed into the "pit" or yard deposit of Feature 34, and material became mixed. The second is that a portion of the primary deposit of Feature 34 was removed during construction or alteration activities and redeposited within this wooden "box" as fill. The terminus post quem of Feature 34 is 1795, the date after which either activity must have taken place. The *terminus post quem* for Feature 35 is also 1795, a date based on the high percentage of underglaze polychrome decorated pearlware. The modal date of 1805 and the mean glass date of 1809 (see Glass section this chapter) support a redeposition date for this feature around the turn of the nineteenth century.

Feature 36

Feature 36 was a small wooden box located along the south lot wall in Lot 23 Unit 4. Based on 1,756 dated sherds of 2,213 recovered (86%), the mean ceramic date is 1794. The modal date is 1791 and the bracketed date is 1670-1840. Four ceramic ware types predominate in the assemblage. Creamware (41.5%), pearlware (32.5%), porcelain (11.6%), and redware (10.9%) represent 96.5% of the ceramics from this feature. Also present in small percentages are brown stoneware, delftware, pink/white bodied slipware, gray stoneware, other non salt-glazed stoneware, red bodied slipware, white salt-glazed stoneware, and buff bodied slipware. The deposit from within this feature contained sherds that were highly mendable to whole and almost whole vessels and also produced large residual sherds that yielded a high MNV count. Thirty crossmends and twenty mends were noted and are included in the MNV count of 96. The Miller Model for economic sealing of nineteenth century ceramics was applied to this assemblage (see Miller Model, this section).

Many vessel forms were represented in the mends, crossmends, and MNV count. The predominant ceramic ware types are undecorated creamware and underglaze polychrome pearlware. All functional categories of vessel forms are present. Food service is represented by plates, bowls, cups, platters, tea pots, tankards, and pitchers; food preparation and storage includes large bowls; vessels related to personal hygiene include a chamber creamware flower pot (see Plates 4.13, 4.17, 4.30 and 4.35).

Many vessels show heavy wear, which is most likely indicative of a primary domestic deposit. There are however, an almost equal number of vessels that display no wear at all. This deposit produced possible sets of bowls of overglaze enamel hard paste porcelain, undecorated creamware, and underglaze polychrome pearlware with no wear present. There are also other vessel forms that display no wear; this suggests that the deposit is of primary commercial origin.

The deposit within this wooden box may represent a combination of domestic and commercial primary ceramics reflecting the two-fold function of the lot during the very late-eighteenth to early-nineteenth century. It is possible that apartments on upper stories over street-level commercial establishments were being rented out as domestic space; the filling of this wooden construction may have utilized refuse from both activities.

Based on the amount of underglaze polychrome painted and transfer printed pearlware present, the date of this fill episode is post-1795. The possible sets of creamware, pearlware, and porcelain bowls mentioned above may be representative of commercial refuse. The documentary record shows that one Garret Kettletas owned and operated a china and glass store on this lot is 1809. It is possible that the commercial component of this deposit is related to this store (see Lot Histories, Chapter 2).

There are two platters from this feature with impressed maker's marks; they are unfortunately not yet identified. The first is an impressed "BB" on the base of a blue shell edged pearlware platter. The second mark, found on the base of an oval creamware platter, is impressed "HP 1809" with a "4" over the HP. The 1809 may or may not be a date. Future research may identify these marks and assign a narrower date range of manufacture within the broader ware range.

Feature 38

Feature 38, located in Lot 23 Unit 4, was a portion of the base of a cistern with an intact floor. Based on the field evidence, the deposits in association with this feature were divided into two levels (38.1 and 38.2); the former above, and the latter below the floor. The ceramic analysis suggests that both levels were redeposited fill material with no apparent significant temporal differences.

The mean ceramic date of 1792 for 38.1 is based on 138 dated sherds of 157 recovered (76%). The modal date is 1791, which is indicative of the high percentage of creamware, and the bracketed date is 1670-1840. Creamware (41.4%) and pearlware (36.9%) predominate in this assemblage. Sherds of brown stoneware, delftware, gray stoneware, other non salt-glazed stoneware, porcelain, redware, red bodied slipware, white salt-glazed stoneware, and buff bodied slipware were recovered with less frequency. This deposit was very fragmented; consequently, based on the criterion used for this analysis, it was not possible to determine a MNV count. In addition, there were no mends or crossmends noted. This level apparently represents redeposited fill and is dated by the percentage of transfer printed and underglaze polychrome pearlware as post-1795 (CTPQ).

The mean ceramic date of 1788 for 38.2 is based on 149 dated sherds of 192 recovered (67%). The modal date is 1791, again indicating creamware, and the bracketed date is 1670-1840. Creamware (34.4%) and pearlware (28.1%) predominate. Sherds of delftware, white bodied earthenware, pink/white bodied slipware, other non salt-glazed stoneware, porcelain, redware, and red bodied slipware, white salt-glazed stoneware, and buff bodied slipware were also recovered. This deposit was also highly fragmented and as was the case in 38.1, it was not possible to determine a MNV count. One crossmend was noted in this level; three sherds of an underglaze polychrome pearlware plate. This deposit also appears to represent redeposited fill. Based on the presence of transfer printed pearlware, this redeposition is dated post-1795 (CTPQ).

The levels above and below the floor of this cistern appear to be redeposited fill with no significant temporal differences seen through the ceramic material. This suggests that the cistern was constructed, in use, and filled within a relatively limited period of time.

Feature 40

Feature 40 is an unidentified stone feature located in Lot 23 Unit 4. Based on the field evidence, this feature was divided into four levels; however, the ceramic analysis suggests only three. The first is 40.1, a redeposited fill episode; the second, 40.2 and 40.3 is redeposited fill with material from the "pit", Feature 34; and the last is 40.4, tentatively identified as landfill in the field, from which no ceramics were recovered.

The mean ceramic date of 1791 for 40.1 is based on 256 dated sherds of 288 recovered (89%). The modal date is 1805, indicative of pearlware, and the bracketed date is 1660-1840. Four ware types predominate in this level: pearlware, 61.5%; redware, 10.1%; buff bodied slipware, 8.3%; and creamware, 6.9%. Sherds of most other gross ware types were also recovered. There were no mends or crossmends noted and it was impossible to determine a MNV, as the deposit was very fragmented. The terminus post quem of this redeposited fill episode is 1795 based on the high percentages of transfer printed and underglaze polychrome pearlware.

The mean ceramic date of 1754 for 40.2 is based on 145 dated sherds of 259 recovered (56%). The modal date is 1755 and the bracketed date is 1670-1830. Five ware types predominate: pink/white bodied slipware, 21.6%; brown stoneware, 17.8%; delftware, 17.0%; white salt-glazed stoneware, 17.4%; and buff bodied slipware, 15.1%. Also recovered in lesser percentages were gray stoneware, creamware, pearlware, porcelain, and redware.

The mean ceramic date of 1755 for 40.3 is based on 255 dated sherds of 388 recovered (66%). The modal date is 1760, and the bracketed date is 1650-1830. Four ware types predominate: redware, 20.4%; white salt-glazed stoneware, 19.8%; pink/white bodied slipware, 17/5%; and buff bodied slipware, 14/7%. Also recovered were brown stoneware, creamware, delftware, and pearlware.

The ware types present and the percentage breakdowns appear to be comparable in 40.2 and 40.3; the modal and bracketed dates are similar. Together these levels comprise one episode of redeposited fill material. The MNV count is 7, including two crossmends, one cross feature mend with Feature 34, and one feature to non-feature mend.

The ceramic assemblage of this unidentified feature is very similar to that of the "pit", Feature 34; and one cross mend between these features has been noted. There are two explanations: the unidentified feature may have been constructed into the primary deposit of Feature 34; yard leveling or stabilization may have coincided with the filling in of this unidentified Feature 40 with material from Feature 34. Based on the dates derived for the "pit", the redeposition of 40.2 and 40.3 post-dates 1795.

There were no ceramics recovered from the tentatively indentified landfill level, 40.4.

Feature 41

Feature 41 was a large rectangular stone privy located in Lot 22 Unit 2. This feature produced 8,383 sherds, the second largest concentration of ceramics excavated from within a feature across the site; this represented 20% of the combined feature ceramic assemblage and 9.4% of the ceramics from the entire site.

Based on the field interpretation and soils evidence, this feature was divided into three levels. The ceramic analysis supports this division. The levels have been interpreted as follows: 41.1 is a primary commercial related deposit; 41.2 is a transitional level of primary commercial into original landfill; and 41.9 is original landfill into which this privy was constructed.

Since it meets all the definitive criteria, level 41.1 has been interpreted as a primary commercial deposit. It was highly mendable; 53 mends and 183 crossmends were noted. The MNV count is 244; 56 were defined during tabulation of the residual sherds, and 188 were mends and crossmends. Whole vessels were recovered and many crossmends from whole and nearly whole vessels and sets of vessels were recognized both by vessel form and decorative style, with no sign of wear indicating use (see Plates 4.16, 4.19, 4.20, 4.22, 4.25-4.29, 4.37, and 4.38).

The mean ceramic date of 1794 for 41.1 is based on 6,626 dated sherds of 7.074 recovered (94%). The modal date is 1791, which is indicative of the high percentage of creamware in the assemblage, and the bracketed date is 1650-1860. Creamware (48.9%) and pearlware (37.6%) predominate in this deposit. Also recovered were salmon bodied earthenware, brown stoneware, delftware, white bodied earthenware, gray stoneware, other non salt-glazed stoneware, porcelain, redware, red bodied slipware, white salt-glazed stoneware, buff bodied slipware, and yellow bodied earthenware. The dating of this commercial deposit is based on the various decorative styles of pearlware; the high percentages of transfer printed and underglaze polychrome painted pearlware suggest deposition post-1795 (CTPQ).

Numerous vessels in this deposit displayed impressed maker's marks, some of which have been identified and dated. "Wedgwood" is impressed on the bases of several creamware vessels, but this does not refine or narrow the general creamware date range for these vessels. "D D & Co. CASTLEFORD" is impressed on the bases of many creamware vessels and one pearlware vessel. This mark is attributable to the pottery works of David Dunderdale and Company of Castleford, England; a manufacturer of both creamware and pearlware from 1790-1820 (Godden 1964:224). "Herculaneum" is impressed on the bases of two creamware vessels. The Herculaneum Pottery of Lancashire, England was in operation 1793-1841, manufacturing earthenwares and porcelains (Godden 1964:321). The known dates of manufacture cited above support the very late-eighteenth-century date interpreted as a possible beginning date of deposition of this level in 41.1.

The specific vessel forms identified from this commercial deposit appear by specific ware type and decoration in Ceramic Table 4.7. Three ceramic ware types predominate: creamware, 45%; pearlware, 44%; and white salt-glazed stoneware, 5%. Bowls of various sizes comprise 57% of the vessel assemblage; the remaining 43% are plates of various sizes, cups, tea bowls, pitchers, tankards, chamber pots, gravy boats, lids, platters, wash basins, tureens, coffee cans, and teapots. Recognizable sets of vessel forms by specific ceramic ware types based on decoration were noted (see Miller 1980; Garrow 1982). Ceramic Table 4.8 represents probable sets of vessels noted; definition as a "set" is based on the presence of three or more size specific forms with the same decorative motif. As was the case for Feature 35, the Miller Model for economic scaling of nineteenth-century ceramics was applied to this assemblage (see Miller Model, this section).

Level 41.2 is a transition zone from a primary commercial deposit into original landfill. The mean ceramic date is 1769, based on 591 dated sherds of 781 recovered (76%). The modal date is 1791, indicative of the creamware percentage present, and the bracketed date is 1660-1860. Three ware types predominate: creamware, 24.6%; white salt glazed stoneware, 24.2%; and buff bodied slipware, 14.6%. Pearlware, redware, and porcelain are present in substantial quantities, while sherds of brown stoneware, delftware, white bodied earthenware, gray stoneware, other non salt-glazed stoneware, red bodied slipware, and yellow bodied earthenware were present in very low percentages.

The MNV count is 5 and all are identifiable forms: two creamware bowls, one creamware plate, and one pearlware bowl, and one redware mug. There were 22 crossmends to the commercial deposit noted in this level, thereby dating 41.2 post-1795.

The mean ceramic date for level 41.9 is 1755, based on 139 dated sherds of 528 recovered (26%). The modal date is 1733 and the bracketed date is 1670-1820. Burned delftware and unidentifiable ceramics comprise 66% of this level, and white salt-glazed stoneware comprises 16.5%. Also recovered were creamware, gray stoneware, porcelain, redware, red bodied slipware, and yellow bodied earthenware. The MNV count is 6: four burned delftware bowls, and a bowl and plate of white salt-glazed stoneware. There were no crossmends noted. This level appears to represent original landfill dating to the last half of the eighteenth century.

Ceramic Table 4.7 175 WATER STREET: Specific Vessel Forms Identified from Feature 41, a Privy in Lot 22

	CREAM-WARE	TRANSFER PAINTED PEARLWARE	EDGE DECORATED PEARLWARE	PAINTED PEARLWARE	PLAIN PEARL-WARE	OVERGLAZE ENAMEL PORCELAIN	UNDERGLAZE PAINTED PORCELAIN	WHITE SALT GLAZED STONEWARE	SCRATCH BLUE STONEWARE	RED-WARE	JACK-FIELD	BASALTES STONE-WARE	BUFF BODIED SLIPWARE	ENGINE TURNED REDWARE	OTHER
PLATTER	2		4												
PLATE 10"	9		3												
PLATE 9"	3														
PLATE 8"	1		7												
PLATE 7"	1														
PLATE 6"	1														
BOWL 6"	3	3		13											
BOWL 5"	9	3		15		1	1	2							
BOWL 4"	2			1				2				1			
BOWL over 6"	22			7	1										
BOWL under 4"	1			8				2							
BOWL no specs	10			7	2		1								
TEACUP no hndl	1														
TEABOWL/CUP	10	5		6				3							
DESSERT CUP															
TANKARD	3														
CHAMBER POT	6														
TEAPOT				3							1			5	
GRAVY BOAT	1														
LID	3			3								2			
POSSET TYPE													2		
BASKET				1											
COFFEE CAN	1														
TUREEN	1														
WASH BASIN	2														
CANDLE STICK	1														
CREAMER				1											
PITCHER	6														

Ceramic Table 4.8 175 WATER STREET: Probable Sets Noted Feature 41, Privy in Lot 22

	CREAMWARE	PAINTED PEARLWARE	PRINTED PEARLWARE	EDGED PEARLWARE	WHITE SALT GLAZED STONEWARE
PLATTERS over 10"	x			x	
PLATE 10"	x			x	
PLATE 9"	x				
PLATE 8"				x	
BOWL over 6"	x	x			
BOWL 6"		x	x		
BOWL 5"	x	x	x		x
BOWL 4"		x			x
BOWL over 4"		x			x
TEABOWL/CUP		x			x
TEACUP	x				
DESSERT CUP	x				

Feature 42

Feature 42 was a square stone privy located inside Feature 43, the large rectangular stone privy in Lot 21 Unit 1. Based on the field interpretation, this feature was divided into three levels (42.1, 42.2, and 42.9). The ceramic analysis, however, suggests there are only two levels: 42.1 and 42.2 were redeposited fill and 42.9 is most likely original landfill.

The mean ceramic date of 1790 for 42.1 is based on 28 dated sherds of 37 recovered (76%). The modal date is 1791, indicative of a high percentage of creamware, and the bracketed date is 1670-1840. Creamware (51.4%), pearlware (16.2%), and redware (10.8%) predominate in the assemblage. Also recovered were sherds of gray stoneware, white salt-glazed stoneware, and buff bodied slipware. There were no mends or crossmends. It was not possible to determine a MNV as the deposit was very fragmented. Based on the presence of transfer printed pearlware, the ceramic (CTPQ) terminus post quem for this level is 1795.

The mean date of 1770 for 42.2 is based on 147 dated sherds of 237 recovered (62%). The modal date is 1791, indicative of creamware, and the bracketed date is 1670-1840. The percentage breakdown is as follows: creamware, 23.6%; white salt-glazed stoneware, 15.2%; pearlware, 11.8%; buff bodied slipware, 10.1%; gray stoneware, 9.3%; delftware, 8.0%; porcelain, 7.2%; and redware, 6.3%. There were no mends or crossmends noted. It was not possible to determine a MNV as this level, too, was very fragmented.

Levels 42.1 and 42.2 together, represent a redeposited fill episode that post-dates 1795 (CTPQ); transfer printed pearlware is present in both levels.

The mean ceramic date of 1750 for 42.9 is based on 211 dated sherds of 375 recovered (56%). The modal date is 1733, indicative of buff bodied slipware, and the bracketed date is 1660-1860. This level, which is most likely original landfill, also contains a transition zone from the redeposited fill level above. Four ware types predominate: buff bodied slipware, 30.9%; redware, 13.6%; white salt-glazed stoneware, 12%; and gray stoneware, 10.7%. Creamware, pearlware and delftware were recovered in minor percentages. There were two crossmends noted.

The highest locus of 42.9 is a transition zone from 42.2 into landfill; it contained the only pearlware sherds in this level, which cross feature mend to the large privy in the lot, Feature 43. The MNV count for 42.9 is 6; 5 of which are in this transition zone. The remainder of the loci comprising 42.9 appear to be original landfill.

The pearlware sherds from 42.9, comprising of one vessel, cross feature with the redeposited fill level of the large privy, a level overlying the original landfill. The terminus post quem for this level is 1780 (see Feature 43), suggesting that Feature 42 and 43 were both filled after 1780.

Feature 43

Feature 43 was a rectangular stone privy located in Lot 21 Unit 1. Based on the field evidence, this feature was divided into three levels (43.1, 43.2, and 43.9). The ceramic analysis suggests there are four levels: 43.1 is redeposited fill; 43.2 is a primary deposit; 43.3 is redeposited fill; and 43.9 is most likely original landfill.

The mean ceramic date of 1784 for 43.1 is based on 254 dated sherds of 390 recovered (68%). The modal date is 1791, indicating a high percentage of creamware, and the bracketed date is 1670-1900. The percentage breakdown by gross ware type is as follows: creamware, 30%; pearlware, 15.6%; delftware, 10%; white salt-glazed stoneware, 9.2%; porcelain, 8.7%; buff bodied slipware, 8.2%; and redware, 7.4%. Present in minor percentages are brown stoneware, gray stoneware, other nonsalt-glazed stoneware, and red bodied slipware. This deposit was very fragmented; there were no mends or crossmends noted. The MNV count is 1, an overglaze enamel porcelain tea bowl. This level appears to be redeposited fill. Based on the presence of sherds of brown stoneware bottles, the terminus post quem for this redeposition is 1820.

The mean ceramic date of 1795 for 43.2 is based on 1,258 dated sherds of 1,417 recovered (89%). The modal date is 1791 and the bracketed date is 1670-1860. Creamware (51.7%) and pearlware (33.5%) predominate. Also recovered in small percentages were delftware, pink/white bodied slipware, gray stoneware, other non salt-glazed stoneware, porcelain, redware, red bodied slipware, white salt-glazed stoneware, and buff bodied slipware. This deposit was highly mendable; 20 crossmends and 30 mends to partially whole vessels were noted. The MNV count is 73; there were many large residual sherds as well. Undecorated creamware and blue shell edged and under glazed polychrome painted pearlware are predominant in the vessel assemblage. All functional form categories are represented: Food service includes bowls, plates, platters, tankards, pitchers, a gravy/sauce boat, soup plates, tea cups, and tea bowls; food preparation is represented by large bowls; personal hygiene includes chamber pots and wash basins; and the decorative category is represented by two redware flower pots (see Plates 4.21, 4.31). Many vessels display wear marks characteristic of a primary domestic deposit. Based on the percentages of transfer printed and polychrome painted pearlware, this deposit post-dates 1795 (CTPQ). The Miller Model was applied to this assemblage (see Miller Model, this section).

The mean ceramic date of 1748 for 43.3 is based on 90 dated sherds of 184 recovered (49%). The modal date is 1733 and the bracketed date is 1660-1860. Three ware types predominate: buff bodied slipware, 23.4%; porcelain, 15.2%; and white salt-glazed stoneware, 13%. There were two crossmends to the level below; these represent a MNV count of 2. This deposit was very fragmented and is most likely redeposited fill. Based on the presence of underglaze blue painted pearlware in all catalogues of this level, the terminus post quem for this redeposition is 1780; there is one sherd of underglaze polychrome pearlware, post-1795, in one catalogue which may or may not be intrusive. The two crossmends to 43.9 may indicate an interface to landfill.

The mean date of 1751 for 43.9 is based on 28 dated sherds of 65 recovered (43%). The modal date is 1733 and the bracketed date is 1670-1820. Three ware types predominate: gray stoneware, 26.2%; buff bodied slipware, 21.5%; and white salt-glazed stoneware, 15.4%. This level is very fragmented and is most likely original landfill into which the privy was constructed. Undecorated creamware, CTPQ 1762, is the latest ceramic present.

Feature 44

Feature 44 was a round stone privy located in Lot 21 Unit 2. A 25 percent sample was recovered from this feature (see Field Report, Lot 21). Based on the field interpretation, the feature was divided into two levels. The ceramic analysis supports this division: 44.1 is a redeposited fill episode; 44.9 is most likely original landfill.

The mean ceramic date of 1762 for 44.1 is based on 78 dated sherds of 168 recovered from the 25% sample. The modal date is 1733 and the bracketed date is 1670-1840. Three ware types predominate: buff bodied slipware, 18.5%; redware, 17.3%; and porcelain, 13.1%. Brown stoneware, creamware, pearlware, gray stoneware, red bodied slipware, white salt glazed stoneware, and yellow bodied earthenware were also recovered in minor percentages. Because this assemblage was very fragmented; it was not possible to determine a MNV count. Based on the presence of Canton/Nanking porcelain, this redeposition probably is dated post-1800; it certainly post-dates 1795, as transfer printed pearlware was also recovered. A Vermont Copper coin, dated 1786, was recovered from this level and supports a very late-eighteenth century terminus post quem.

The mean ceramic date of 1735 for 44.9 is based on 9 dated sherds of 30 recovered. The modal date is 1733 and the bracketed date is 1650-1805. Sherds of delftware, gray stoneware, porcelain, white salt-glazed stoneware, buff bodied slipware, and yellow bodied earthenware were recovered. No creamware or pearlware sherds were present. This level is possibly original landfill, but the sample is too small to be conclusive.

Feature 46

Feature 46 was a semi-circular stone feature, possibly a drain, located inside the large stone privy, Feature 43, in Lot 21 Unit 1. The ceramic material within this feature suggests it was constructed into the domestic deposit in Feature 43.

The mean ceramic date of 1779 for this feature is based on 62 dated sherds of 95 recovered (65%). The modal date is 1791 and the bracketed date is 1660-1860. Creamware predominates in this assemblage (31.6), sherds of most gross ware types are present. Three crossmends from Feature 46 -- a creamware pitcher, a porcelain low bowl, and an underglaze polychrome painted pearlware tankard -- suggest that this deposit is redeposited feature fill. Based on the date of the primary domestic deposit in Feature 43, this redeposited fill episode post-dates 1795. It is also possible that this deposit post-dates 1820, a suggestion based on the date of the redeposited fill level overlying the domestic deposit in Feature 43.

Feature 47

Feature 47 was a rectangular stone privy located in Lot 20 Unit 5. Based on field interpretation, this feature was divided into three levels (47.1, 47.2, and 47.3). The ceramic analysis does not contradict this division. All three levels appear to contain redeposited fill material with few ceramics.

The mean ceramic date of 1743 for 47.1 is based on 3 dated sherds of only 8 recovered (38%). The modal date is 1733 and the bracketed date is 1670-1795. Due to the small sample it is not possible to interpret 47.1 on its own.

The mean ceramic date of 1785 for 47.2 is based on 10 sherds of 21 recovered (48%). The modal date is 1805 and the bracketed date is 1720-1830. Sherds of brown stoneware, creamware, delftware, pearlware, gray stoneware, porcelain, redware, red bodied slipware, and white salt-glazed stoneware comprise the assemblage. This level of redeposited fill is dated post-1795, a date based on the presence of underglaze polychrome painted pearlware (CTPQ); however, an American nickel recovered from this level is dated 1867-1883, suggesting the redeposition occurred after 1867. The glass data supports, a mid-nineteenth-century fill episode (see Glass this chapter).

The mean ceramic date of 1757 for 47.3 is based on 32 dated sherds of 56 recovered (57%). The modal date is 1733 and the bracketed date is 1670-1830. The newest ceramic present is creamware, dating this level post-1762 (CTPQ).

There were no mends or crossmends noted in this feature; it was not possible to determine MNV as the assemblages were very fragemented. The three levels appear to be redeposited fill; however, the small sample makes it difficult to draw definite conclusions.

Feature 48

Feature 48 was a rectangular stone privy located in Lot 20 Unit 2. Based on the field evidence, this feature was divided into three levels (48.1, 48.2, and 48.3). The ceramic analysis suggests only two levels; 48.1 and 48.2 being a redeposited fill episode and 48.9, of which only 56% was screened, being original landfill.

The mean ceramic date of 1779 for 48.1 is based on 53 dated sherds of 84 recovered (63%). The modal date is 1791, and the bracketed date is 1660-1830. Four ceramic ware types predominate: creamware, 32.1%; pearlware, 11.9%; porcelain, 11.95%, and redware, 11.9%. Also recovered were sherds of delftware, gray stoneware, red bodied slipware, white salt-glazed stoneware, buff bodied slipware, and yellow bodied earthenware. The newest ceramic present is underglaze polychrome pearlware, providing a ceramic terminus post quem (CTPQ) of 1795.

The mean ceramic date of 1784 for 48.2 is based on 215 dated sherds of 319 recovered (67%). The modal date is 1791, and the bracketed date is 1670-1900. The same four ware types predominate in 48.2: creamware, 36.7%; pearlware, 14.1%; porcelain, 15.05%; and redware, 6.5%. Also recovered were brown stoneware, delftware, gray stoneware, other non salt-glazed stoneware, white salt-glazed stoneware, and buff bodied slipware. This level is dated post 1795 based on the amount of transfer printed and polychrome underglaze pearlware.

There were no mends or crossmends noted in 48.1 and 48.2. The MNV count is 2, a blue decorated gray salt-glazed stoneware storage vessel and a 6 inch transfer printed pearlware bowl. The deepest locus in 48.2 yielded a dated coin, an American gold Half Eagle five dollar piece, dated 1799. This episode of redeposition is therefore dated post-1799.

The mean ceramic date of 1734 for 48.9 is based on 4 dated sherds of only 21 recovered (19%); the modal date is 1733 and the bracketed date is 1670-1795, the date range for all datable ceramics from this level. Sherds of slipware, stoneware, delftware, and redware were recovered. The MNV count is 1, the base of a posset type drinking cup.

This deposit is probably original landfill into which this stone privy was constructed. The small size of the sample from this level makes it difficult to draw concrete conclusions and the broad and consistent date range renders the terminus post quem for this level, 1690, somewhat invalid.

Feature 49

Feature 49 was a wooden "cofferdam/box" located in Lot 20 Units 5 and 6. Based on the field interpretation and soil evidence, this feature was divided into four levels (49.1, 49.2, 49.3, and 49.9). The ceramic analysis suggests there are two levels: 49.1, 49.2, and 49.3 represent one primary domestic deposit within a matrix of redeposited fill material, and 49.9 is most likely original landfill. Level 49.1, 49.2, and 49.3 will be discussed separately and then summarized.

The mean ceramic date of 1786 for 49.1 is based on 1,514 dated sherds of 1,835 recovered (83%). The modal date is 1791 which indicates the high percentage of creamware present. The bracketed date is 1650-1840. Creamware (48.3%) and pearlware (21.1%) predominate in this assemblage. Also recovered were sherds of brown stoneware, delftware, gray stoneware, porcelain, redware, white salt-glazed stoneware, buff bodied slipware, non salt-glazed stoneware, white bodied earthenware, red bodied slipware, and yellow bodied earthenware. The MNV count for this level is 69.

The mean ceramic date of 1794 for 49.2 is based on 28 dated sherds of 30 recovered (93%). The modal date is 1800, which is indicative of the high percentage of underglaze blue painted pearlware. The bracketed date is 1670-1820. The percentage breakdown is as follows: creamware, 36.7%; pearlware, 53.3%; gray stoneware, 3.3%; porcelain, 3.3%; and buff bodied slipware, 3.3%. The MNV count for this level is 1.

The mean ceramic date of 1771 for 49.3 is based on 3 dated sherds of 70 recovered (61%). The modal date is 1791, indicative of the high creamware percentage, and the bracketed date is 1670-1820. The percentage breakdown is as follows: creamware, 31.4%; redware, 21.4%, buff bodied slipware, 17.1%; gray stoneware, 8.6%; white salt-glazed stoneware, 5.7%; pearlware, 4.3%; porcelain, 2.9%; delftware, 2.9%; and brown stoneware, 1.4%. The MNV count is 1 for this level. Based on the early mean date, this level probably includes a transition to the landfill level below.

Crossmends across all three levels were noted, which support the interpretation that they represent one episode of deposition. A total of 28 crossmends, 17 mends, and 5 feature to non-feature mends were noted. Wear marks of varying degrees were noted on several vessels, which is considered characteristic of a domestic, as opposed to a commercial, deposit (see Plate 4.49).

The MNV count is 71. The ceramic ware types which predominate in the vessel assemblage are underglaze blue painted pearlware and undecorated creamware. Most functional vessel form categories are represented in the assemblage. Food service includes 6, 7, 9, and 10 inch plates, small bowls, saucers, tea bowls, pitchers, tea pots, tankards, posset type drinking cups, and a gravy/sauce boat; food preparation includes large bowls. Personal hygiene is represented by chamber pots.

The primary domestic deposit is dated post-1795 based on the presence of underglaze polychrome painted and mocha decorated pearlware. Because of its potential status-related information, the Miller Model for economic scaling of ninteenth-century ceramics was applied to this feature (see Miller Model, this section).

Eleven sherds, all undatable porcelain and redware, were recovered from 49.9. This level had been tentatively defined in the field as original landfill; however, the ceramic sample is too limited to confirm this (see Landfill, Chapter 5 for discussion of this feature and its possible interpretations).

Feature 50

Feature 50 was a rectangular stone and wood privy cut into the wharving in Lot 19 Unit 3. Based on field interpretation, this feature was divided into two levels. The ceramic analysis supports this division: 50.1 was a redeposited fill episode with domestic refuse; and 50.9 was probably original landfill in association with the wharving.

The mean ceramic date of 1764 for 50.1 is based on 262 dated sherds of 440 recovered (60%). The modal date is 1791, and the bracketed date is 1670-1900. Three ware types predominate: creamware, 25.7%; porcelain, 25%; and buff bodied slipware, 23%. Gray stoneware, delftware, redware, white salt-glazed stoneware, brown stoneware, pearlware, yellow bodied earthenware, red bodied slipware, white bodied earthenware, other non salt-glazed stoneware, and whiteware were also recovered.

There were 9 crossmends and 3 mends to partially whole vessels noted in this level; the MNV count is 12 (see Plates 4.18 and 4.44). Two plates, a chamber pit, and a salt cellar are undecorated creamware. Five porcelain bowls were identified, as were Nottingham stoneware and Rockingham type earthenware holloware vessels. Heavy wear was noted on many of these vessels, a characteristic of a primary domestic deposit. This level probably reflects domestic refuse in redeposited fill. The presence of whiteware gives this redeposition a ceramic terminus post quem of 1820.

The mean ceramic date of 1778 for 50.9 is based on 33 dated sherds of 57 recovered (58%). The modal date is 1791, and the bracketed date is 1670-1820. Creamware (42.1%), porcelain (15.8%), gray stoneware (12.3%), and buff bodied slipware (10.5%) predominate.

There were no mends or crossmends noted and, as the assemblage was very fragmented, it was not possible to determine MNV. This deposit may be original landfill since creamware is the newest ceramic present; this ware type dates the deposit post-1762 (CTPQ).

Feature 51

Feature 51 was a rectangular stone privy located in Lot 18 Unit 2. Based on field interpretation, this feature was divided into three levels. The ceramic analysis tends to support these divisions. The first level (51.1) is a primary domestic deposit in a matrix of redeposited fill; the second (51.2) is redeposited fill; and the last (51.9) appears to be original landfill.

The mean ceramic date of 1784 for 51.1 is based on 258 dated sherds of the 359 recovered (72%). The modal date is 1791, and the bracketed date is 1660-1860. Creamware, pearlware, and porcelain predominate in the assemblage. The percentage by gross ware type is as follows: creamware, 42.1%; porcelain, 17.3%; pearlware, 14.5%; white salt-glazed stoneware, 6.4%; buff bodied slipware, 6.1%; and redware, 4.5%. Also recovered in small percentages were salmon bodied earthenware, brown stoneware, delftware, pink/ white bodied slipware, gray stoneware, other nonsalt-glazed stoneware, red bodied slipware, and yellow bodied earthenware.

There were six crossmends noted in this deposit, including one 6 inch diameter creamware bowl, a white salt-glazed stoneware plate, a 10 inch feather edged creamware plate, a 5 inch overglaze enamel creamware bowl, an overglaze enamel creamware pitcher, and a 9 inch molded creamware plate. All the plates and the 6 inch bowl display wear marks (see Plate 4.15).

The MNV count is 24, including portions of bowls, plates, and tea bowls in addition to the crossmends. This deposit appears to be of primary domestic origin within a matrix of redeposited fill. Based on the percentage of pearlware in the assemblage, it appears to post-date 1780.

The mean ceramic date of 1747 for 51.2 is based on 49 dated sherds of 97 recovered (51%). The modal date is 1733, and the bracketed date is 1660-1830. There were no mends or crossmends in this deposit. The MNV is 1, a pedestal-footed delft ointment pot. The largest percentage of sherds (33%) is buff bodied slipware. Except for whiteware, sherds of each gross ware type defined in this analysis were recovered. The fragmented condition of the sherds, the early mean date, and the variety of ware types suggest that this level is redeposited fill. Two sherds of underglaze blue painted pearlware establish a post-1780 date for this redeposition.

As noted above, 51.9 is most likely original landfill. Only six sherds were recovered from this level and the mean date, based on only four sherds, is 1742 (67%). The modal date is 1750 and the bracketed date is 1670-1795. The sherds are buff bodied slipware, delftware, porcelain, and redware. The sample from this level is too small to draw concrete conclusions.

Feature 52

Feature 52 was a square wooden "box" located in Lot 18 Unit 1. Three feature levels were defined (52.1, 52.2, and 52.9) based on field interpretation. The ceramic analysis suggests there are two levels, one a redeposited fill (52.1 and 52.2) overlying the original landfill (52.9) onto which this feature was probably dug. Since sampling was less than 100% in this feature and all sample sizes varied (see Chapter 3, Lot 18), the validity of comparing feature levels is dubious.

Thirty-two sherds were recovered from 52.1. A mean ceramic date of 1791 is based on 25 dated sherds (78%). The modal date is 1791, and the bracketed date is 1700-1830. Creamware and pearlware predominate. No MNV was established for this level.

Forty-one sherds were recovered from 52.2. The mean date of 1789 is based on 27 dated sherds (66%). The modal date is 1791, and the bracketed date is 1670-1840. Creamware, pearlware, and redware predominate. An MNV count of 2 was established; a redware drinking cup and a 10 inch creamware plate were noted.

Thirteen sherds were recovered from 52.9. A mean ceramic date of 1740 is based on 7 sherds (54%). The modal date is 1733, and the bracketed date is 1670-1805. No creamware or pearlware was recovered, and buff bodied slipware predominates. No MNV was established for this level.

Levels 52.1 and 52.2 appear to be one episode of redeposited fill. The presence of transfer printed pearlware dates this deposit to post-1795.

Level 52.9 may be original landfill, but the sample is too small to be conclusive.

Feature 54

Feature 54 was the base of a brick cistern located in Lot 18 Unit 4. Field observations provided information to divide this feature into two levels: an internal deposit and a deposit recovered below the broken floor of the cistern. Ceramic analysis supports this division; 54.1 is redeposited fill and 54.2 is probably original landfill. Less than 100% of this feature was sampled (see Field Report, Lot 18). The first locus was screened 100%, but material from subsequent loci was screened 25% and 50%.

Based on 22 dated sherds of 49 recovered, the mean ceramic date for 54.1 is 1779. The modal date is 1791, indicative of creamware, and the bracketed date is 1670-1840. The percentage breakdown is as follows: creamware, 18.4%; redware, 18.4%; pearlware, 12.2%; buff bodied slipware, 12.2%; porcelain, 10.2%; delftware 10.2%; other non salt-glazed stoneware, 8.2%; gray stoneware 8.2%; and white salt-glazed stoneware, 2.0%.

There were no mends or crossmends noted in this deposit; the assemblage was very fragmented making it impossible to derive a MNV count. It was not possible to determine vessel forms beyond the level of flatware versus hollow ware.

Although the sample is rather small to be conclusive, this deposit appears to be redeposited fill. The percentages of transfer printed and underglaze polychrome pearlware provide a terminus post quem of 1795 for this redeposition.

The second deposit, 54.2, produced 19 sherds. This deposit was tentatively defined from field observations as original landfill. The mean ceramic date based on only 9 dated sherds is 1740. The modal date is 1733, indicative of buff bodied slipware, and the bracketed date is 1670-1805. No creamware or pearlware sherds were recovered, and buff bodied slipware predominates. This deposit may be original landfill, however, the sample is too small to be conclusive.

Feature 57

Feature 57 was a wooden barrel located in Lot 33 Unit 5. The barrel was situated just to the southeast and under the walls of Feature 2, the stone privy in Lot 33, and appeared to have been disturbed by the construction of the privy. The interior deposit, which is mixed, comprised primary domestic material and redeposited fill analyzed as one level.

A mean ceramic date of 1787 is based on 122 dated sherds of 197 recovered (63%). The modal date is 1791, and the bracketed date is 1670-1860. Four ware types predominate: creamware, 42.1%; porcelain, 24.4%; pearlware, 9.1%; and delftware, 8.6%. Gray stoneware, other non salt-glazed stoneware, redware, red bodied slipware, white salt-glazed stoneware, and buff bodied slipware were also recovered in lesser quantities.

Ceramic Table 4.9 175 WATER STREET: Gross Ware Type Percentages by Feature and Level for Selected Features

Feature Number	Feature By Level	WA	WB	WC	WD	WE	WG	WH	WK	WL	WN	WP	WR	WS	WT	WU	WW	WY	Total Sherds
1	1.1	.0	0.8	2.5	0.4	8.8	2.1	0.4	.0	1.3	.0	58.2	3.8	.0	1.3	1.7	18.8	.0	239
	1.2	.0	3.1	6.3	6.3	9.4	.0	.0	.0	12.5	.0	18.8	12.5	.0	.0	18.8	6.3	6.3	32
	1.9	.0	5.1	.0	.0	.0	7.7	.0	.0	43.6	5.1	12.8	7.7	.0	.0	17.9	.0	.0	39
2	2.1	.0	2.8	37.5	8.9	24.2	2.4	.0	.0	0.8	2.4	6.0	4.0	0.4	5.6	4.8	.0	.0	248
	2.2	.0	1.5	18.8	30.7	7.8	1.9	2.8	0.4	0.9	0.4	7.2	10.0	1.7	9.1	9.5	.0	.0	528
	2.9	.0	.0	1.1	15.6	.0	1.1	1.1	1.1	23.4	1.1	10.0	12.2	2.2	10.0	20.0	.0	1.1	90
3	3.1	0.3	1.4	28.1	13.8	5.1	0.3	0.6	0.6	3.4	0.6	14.0	13.5	1.4	5.9	9.3	.0	2.0	356
	3.2	.0	24.2	18.5	7.3	1.9	.0	.0	5.4	3.1	.0	6.2	7.3	11.5	6.5	7.7	.0	0.4	260
	3.9	.0	2.5	26.1	13.2	0.5	1.2	.0	0.5	9.5	0.2	10.2	18.4	3.2	10.7	3.7	.0	.0	402
4	4.1	.0	1.5	25.0	15.3	8.3	0.7	.0	3.5	.0	0.7	10.4	8.3	1.4	15.3	7.6	.0	.0	144
	4.2	.0	.0	17.6	9.5	6.8	.0	.0	.0	2.7	1.4	10.8	27.0	1.4	12.2	10.8	.0	.0	74
	4.3	.0	3.1	23.5	17.3	9.2	.0	.0	1.0	2.0	.0	5.1	12.2	2.0	17.3	7.1	.0	.0	98
27	27.1	.0	0.4	44.7	4.8	13.7	1.2	.0	0.2	1.7	0.3	5.4	19.2	0.5	5.2	2.2	.0	0.4	960
28	28.1	.0	2.9	27.8	10.1	1.0	0.5	0.2	.0	2.5	1.0	7.9	16.7	5.4	17.7	6.1	.0	0.2	407
30	30.1	0.1	0.6	31.1	2.8	40.6	0.6	.0	.0	1.7	0.2	5.0	11.4	1.0	2.6	2.2	.0	0.1	1202
	30.2	.0	10.6	31.9	2.0	31.2	0.3	1.0	.0	1.7	0.7	6.3	7.6	.0	2.3	4.3	.0	.0	301
	30.3	.0	1.6	6.4	4.8	1.6	11.2	.0	.0	4.0	.0	11.2	5.6	0.8	34.4	18.4	.0	.0	125
	30.4	.0	1.6	2.4	7.3	.0	11.3	.0	.0	2.4	.0	23.4	11.3	1.6	26.6	12.1	.0	.0	124
31	31.1	.0	32.0	4.6	5.1	0.5	.0	.0	.0	2.0	.0	0.5	6.1	1.0	25.4	21.8	.0	1.0	197
	31.2	.0	.0	.0	.0	.0	33.3	.0	.0	.0	.0	.0	16.7	.0	.0	50.0	.0	.0	6
32	32.1	.0	.0	24.8	10.3	16.2	0.9	0.9	13.7	1.7	0.9	1.7	4.3	1.7	12.8	9.4	.0	0.9	117
	32.2	.0	0.5	4.6	8.1	2.4	5.2	0.1	56.3	0.4	1.0	1.5	3.7	0.1	11.6	4.5	.0	.0	1477
	32.3	.0	.0	.0	20.0	10.0	.0	.0	40.0	.0	.0	.0	20.0	.0	10.0	.0	.0	.0	10
	32.4	.0	.0	50.0	.0	50.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2
33	33.1	0.3	0.6	3.4	24.8	.0	3.4	.0	1.2	4.6	6.4	5.8	7.3	0.6	31.2	10.4	.0	.0	327
34	34.1	.0	3.9	8.1	11.6	2.1	1.2	0.1	34.5	0.7	0.2	0.7	4.9	0.2	18.5	13.4	.0	.0	3186
	34.2	.0	2.1	6.2	7.2	0.8	2.7	0.1	30.5	0.4	.0	0.6	6.3	0.2	18.0	24.7	.0	.0	2807
	34.3	.0	1.6	5.6	6.9	.0	0.2	.0	34.7	0.9	0.1	0.8	7.0	0.3	13.9	31.7	.0	.0	5397
	34.4	.0	2.5	10.3	16.8	0.1	1.8	.0	3.7	1.5	4.1	2.3	1.9	0.3	28.4	21.4	.0	0.3	730
	34.5	.0	2.5	7.2	8.4	2.5	.0	.0	5.5	0.8	0.4	0.4	2.1	.0	8.0	62.0	.0	.0	237
35	35.1	.0	0.5	40.9	1.6	47.2	0.4	0.1	0.3	0.5	2.9	0.5	1.6	0.1	1.6	1.6	.0	.0	1160
	35.2	.0	1.0	29.7	10.3	25.5	.0	.0	1.8	.0	3.0	1.2	1.8	.0	10.9	12.7	.0	.0	165
36	36.1	.0	.0	43.8	0.6	32.6	.0	.0	0.2	0.4	2.7	11.9	4.4	0.6	1.3	1.4	.0	.0	2060
	36.2	.0	5.9	5.9	5.9	31.4	.0	.0	1.3	.0	3.9	1.3	3.9	.0	13.7	26.8	.0	.0	153
38	38.1	.0	0.6	41.4	2.5	36.9	.0	.0	.0	0.6	.0	5.1	3.8	0.6	5.1	3.2	.0	.0	157
	38.2	.0	.0	34.4	6.3	28.1	.0	0.5	1.0	8.9	0.5	3.1	3.1	.0	9.9	4.2	.0	.0	192
40	40.1	.0	0.7	6.9	2.1	61.5	.0	.0	1.7	0.7	0.7	3.1	10.1	.0	3.8	8.3	.0	0.3	288
	40.2	.0	17.8	5.8	17.0	0.8	2.3	0.4	21.6	.0	.0	0.4	1.5	.0	17.4	15.1	.0	.0	259
	40.3	.0	3.1	8.2	8.2	0.3	7.7	.0	17.5	.0	.0	.0	20.4	.0	19.8	14.7	.0	.0	388
	40.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0
41	41.1	.0	0.3	48.9	1.2	37.6	0.7	.0	.0	0.8	2.3	0.7	1.3	0.2	3.6	2.3	.0	.0	7074
	41.2	.0	0.6	24.6	1.8	8.5	11.1	0.1	0.1	1.7	0.1	5.2	5.5	0.9	24.2	14.6	.0	0.9	781
	41.9	.0	.0	1.9	0.2	.0	66.1	.0	.0	2.3	0.2	3.0	1.1	0.4	16.5	8.0	.0	0.4	528
42	42.1	.0	.0	51.4	.0	16.2	2.7	.0	.0	5.4	.0	5.4	10.8	.0	2.7	2.7	.0	2.7	37
	42.2	.0	.0	21.6	8.0	11.8	4.2	.0	.0	9.3	1.3	7.2	6.3	2.1	15.2	10.1	.0	0.8	237
	42.9	.0	0.8	6.9	6.9	2.1	3.2	0.3	.0	10.7	.0	7.5	13.6	2.4	12.0	30.9	.0	2.7	375
43	43.1	.0	1.0	30.0	10.3	15.6	0.5	.0	.0	4.4	1.5	8.7	7.4	3.1	9.2	8.2	.0	.0	390
	43.2	.0	.0	51.7	1.6	33.5	0.5	.0	0.3	0.9	0.6	4.1	3.6	0.4	2.1	0.8	.0	0.1	1417
	43.3	.0	.0	3.3	7.1	2.7	10.3	0.5	.0	7.6	0.5	15.2	4.9	7.6	13.0	23.4	.0	3.8	184
	43.9	1.5	.0	6.2	3.1	.0	3.1	4.8	.0	26.2	7.7	3.1	4.6	3.1	15.4	21.5	.0	.0	65
	44.1	.0	0.6	4.8	11.9	8.3	5.4	.0	.0	9.5	.0	13.1	17.3	1.2	8.3	18.5	.0	1.2	168
44	44.9	.0	.0	.0	20.0	.0	3.3	.0	.0	33.3	.0	13.3	.0	.0	6.7	20.0	.0	3.3	30
46	46.1	.0	.0	31.6	14.7	12.6	8.4	.0	.0	2.1	.0	6.3	6.3	1.1	8.4	8.4	.0	.0	95

Ceramic Table 4.9 175 WATER STREET (continued)

Feature Number	Feature By Level	WA	WB	WC	WD	WE	WG	WH	WK	WL	WN	WP	WR	WS	WT	WU	WW	WY	Total Sherds
47	47.1	.0	.0	.0	.0	.0	12.5	.0	.0	.0	.0	12.5	37.5	.0	12.5	25.0	.0	.0	8
	47.2	.0	4.8	9.5	4.8	19.0	.0	.0	.0	9.5	.0	9.5	14.3	4.8	23.8	.0	.0	.0	21
48	47.3	.0	.0	14.3	8.9	.0	5.4	.0	.0	8.9	7.1	8.9	10.7	1.8	12.5	21.4	.0	.0	56
	48.1	.0	.0	32.1	6.0	11.9	4.8	.0	.0	2.4	.0	11.9	11.9	2.4	6.0	8.3	.0	2.4	84
	48.2	.0	1.6	36.7	6.9	14.1	2.5	.0	0.9	1.9	0.9	15.0	6.6	.0	5.3	7.5	.0	.0	319
49	48.9	.0	4.8	.0	19.0	.0	14.3	.0	.0	4.8	23.8	4.8	9.5	4.8	.0	14.3	.0	.0	21
	49.1	.0	2.2	48.3	4.0	21.1	0.9	0.1	.0	2.0	0.1	4.7	5.7	0.4	4.5	5.9	.0	0.1	1835
	49.2	.0	.0	36.7	.0	53.3	.0	.0	.0	3.3	.0	3.3	.0	.0	.0	3.3	.0	.0	30
	49.3	.0	1.4	31.4	2.9	4.3	4.3	.0	.0	8.6	.0	2.9	21.4	.0	5.7	17.1	.0	.0	70
	49.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	18.2	81.8	.0	.0	.0	.0	.0	11
50	50.1	0.5	2.5	25.7	7.3	0.7	0.7	.0	1.1	0.7	0.2	25.0	7.3	0.2	4.3	23.0	0.2	0.7	440
	50.9	.0	.0	42.1	7.0	.0	3.5	.0	.0	12.3	1.8	15.8	.0	1.8	5.3	10.5	.0	.0	57
51	51.1	0.3	1.1	42.1	2.5	14.5	1.1	.0	0.3	1.7	1.1	17.3	4.5	0.6	6.4	6.1	.0	0.6	359
	51.2	2.1	1.0	4.1	5.2	2.1	3.1	4.1	4.1	8.2	4.1	6.2	14.4	3.1	2.1	33.0	.0	3.1	97
	51.9	.0	.0	.0	16.7	.0	.0	.0	.0	.0	.0	33.3	16.7	.0	.0	33.3	.0	.0	6
52	52.1	.0	3.1	50.0	.0	21.9	3.1	.0	.0	.0	.0	3.1	6.3	9.4	3.1	.0	.0	.0	32
	52.2	.0	.0	53.7	.0	7.3	.0	.0	.0	.0	.0	2.4	31.7	.0	.0	4.9	.0	.0	41
	52.9	.0	.0	7.7	.0	.0	15.4	.0	.0	.0	.0	15.4	15.4	.0	7.7	38.5	.0	.0	13
54	54.1	.0	.0	18.4	10.2	12.2	.0	.0	.0	8.2	8.2	10.2	18.4	.0	2.0	12.2	.0	.0	49
	54.2	.0	.0	.0	10.5	.0	.0	5.3	.0	10.5	.0	10.5	10.5	5.3	10.5	36.8	.0	.0	19
57	57.1	.0	.0	42.1	8.6	9.1	.0	.0	.0	1.5	1.0	24.4	4.1	1.0	5.1	3.0	.0	.0	197
	57.9	.0	.0	4.8	4.8	.0	.0	.0	.0	9.5	.0	19.0	9.5	.0	23.8	23.8	.0	4.8	21

This deposit was highly mendable; it contained 19 crossmends and the MNV count was 22 (see Plates 4.24 and 4.43). Most of the vessels were creamware and included six 10 inch plates, a teapot, a soup plate, a platter, two 4 inch bowls, a 5 inch bowl, and a 6 inch bowl. Two teacups and two 6 inch bowls were porcelain; a finger painted mug and an overglaze blue painted pitcher were pearlware; a delftware mug and a white salt-glazed tea bowl were also identified. Many of these vessels display wear marks indicating use, an important criterion for determining a primary domestic component in the deposit.

There were three feature to non-feature mends noted from this deposit; there is also a cross feature mend to the stone privy, Feature 2. This supports the theory that the barrel was partially disturbed by the construction of the walls of the stone privy. Based on the presence of Canton/Nanking porcelain, the barrel deposit is dated post-1800 (CTPQ).

The mean ceramic date of 1748 for 57.9 is based on 12 dated sherds of 21 recovered (57%). The modal date is 1733 and the bracketed date is 1670-1820. Three ware types predominate in this level: white salt-glazed stoneware, 23.8%; buff bodied slipware, 23.8%; and porcelain, 19%. A sherd each of creamware, delftware, and yellow bodied earthenware and two sherds each of gray stoneware and redware were also recovered. No sherds of pearlware or whiteware were present. Based on the presence of one sherd of creamware, the CTPQ is 1762. The level may represent original landfill, but the ceramic sample is too small to be conclusive.

Non-Feature Ceramics

As mentioned in the introduction to this section, the feature ceramic assemblages received the most intensive analyses of all the ceramics recovered through excavation of the 175 Water Street Block. However, all non-feature ceramics recovered during these excavations were tabulated and identified by gross ceramic ware types. This tabulation was completed by assistant analyst, Steven Gross, and all data were entered into the computer. The typology for the gross ware types was derived from the more intensive feature ceramic analysis.

The non-feature assemblage includes ceramics associated with original landfill and subsequent lot or engineering fill. As a consequence, these ceramics were generally in a far more fragmented condition than those recovered from primary feature deposits. The non-feature ceramics generally had few minor mends noted, few if any crossmends, and often displayed wear and staining caused by exposure to fluctuating water levels and depositional factors.

The gross ceramic ware types identified from the non-feature assemblages were comparable to those recovered from features. It should be noted, however, that a generally higher proportion of delftware, red bodied slipware, white salt-glazed stoneware, and porcelain were recovered from the non-feature ceramics than was seen in the feature assemblages (see Plates 4.14, 4.34, 4.41, and 4.45). This may reflect the earlier time-frame of the basic fill as compared with that from later, occupation-related features.

The Miller Model

As stated in the Introduction to this section, questions regarding social status theoretically may be addressed through ceramic analysis. George Miller (1980) has developed a model for determining the relative value and therefore, status of nineteenth-century decorated earthenwares. It should be noted that the value index used in this model does not evaluate slip- decorated wares, most stoneware, or porcelain--all substantial components in the 175 Water Street features.

The Miller Model was applied to four feature assemblages recovered from the 175 Water Street block. Three deposit types were represented in these features; Feature 41 was a primary commercial deposit, Features 43 and 49 were primary domestic deposits, and Feature 36 was a combination deposit of primary commercial and domestic material (see text for feature descriptions). Among other factors, these deposits were selected for their potential applicability to the time frame established in the model; however, it appears that they pre-date large scale manufacture of transfer printed tableware, an important diagnostic in the Miller analysis. The high MNV counts for these deposits facilitated statistical comparisons. Ceramic Figure 4.2 graphically illustrates the average cost of cups, bowls, and plates relative to undecorated creamware, the basis of the CC index, in the four features analyzed (see Ceramic Table 4.10 for computations of relative values). The 1814 price list was used throughout because it appeared to represent the most applicable scale year and was also relatively complete. This list remained standard to the 1840s (Miller 1982: personal communication).

The range of index values from the four features are comparable to those used by Miller in his analysis (see Miller 1980:14, Figure 6). The domestic deposit in Feature 43 exhibits the widest range of expenditure; the combination deposit in Feature 36 the narrowest. This results from the percentage of decorated vessels in the former, compared to the number of undecorated creamware vessels in the latter.

The index values above the CC cost for plates represent the lowest levels of expenditure for analyzed commercial and domestic deposits. All four features have index values for plates lower than any site in the Miller analysis, and it is interesting that relative values for cups and bowls are consistently higher than those for plates in both commercial and domestic deposits.

The relative expenditure over the cost of CC ware for cups is highest in the domestic deposit from Feature 43. The domestic deposit from Feature 49 also has a high relative value for cups. Although, as mentioned earlier, Miller does not compute values for porcelain, the presence of porcelain cups and bowls (most likely indicative of the China trade in the Port of New York) in these features suggests relatively high values for these assemblages. Based on Miller, the highest relative value for bowls is found in the combination deposit in Feature 36 and in the commercial deposit from Feature 41. As opposed to plate values, the relative values for cups and bowls from these features all fall within the range of those present in the sites analyzed by Miller.

CERAMIC TABLE 4.10 175 WATER STREET: Computation of Index Values for Plates, Bowls, and Cups After Miller, 1980 on Four Features (Scale Year: 1814)

Form	Type of Decoration	Index Value*		Number Recovered		Product		
Plates	cc	1.0	x	14	=	14.0		FEATURE 41
	Edged	1.29	x	10	=	12.9		LOT 22
		TOTAL		24		26.9		UNIT 2
		AVERAGE VALUE			=	1.12	16%	
Bowls	cc	1.0	x	47	=	47.0		
	Printed	2.8	x	6	=	16.8		
	Painted	1.6	x	51	=	81.6		
	Basalt	6.0	x	2	=	12.0		
		TOTAL		106		157.4		
		AVERAGE VALUE			=	1.59	70%	
Cups	cc	1.0	x	11	=	11.0		
	Printed	3.0	x	5	=	15.0		
	Painted	1.5	x	6	=	9.0		
		TOTAL		22		35.0		
		AVERAGE VALUE			=	1.59	14%	
Plates	cc	1.0	x	9	=	9.0		FEATURE 36
	Edged	1.29	x	15	=	19.35		LOT 23
		TOTAL		24		28.91		UNIT 4
		AVERAGE VALUE			=	1.18	44%	
Bowls	cc	1.0	x	11	=	11.0		
	Dipped	1.20	x	1	=	1.2		
	Painted	1.60	x	12	=	19.2		
	Printed	2.80	x	3	=	8.4		
		TOTAL		27		39.8		
		AVERAGE VALUE			=	1.47	49%	
Cups	cc	1.0	x	2	=	2.0		FEATURE 36
	Painted	1.5	x	2	=	3.0		LOT 23
		TOTAL		4		5.0		UNIT 4
		AVERAGE VALUE			=	1.25	7%	
Plates	cc	1.0	x	9	=	9.0		FEATURE 43
	Edged	1.29	x	18	=	23.22		LOT 21
		TOTAL		27		32.22		UNIT 1
		AVERAGE VALUE			=	1.19	47%	
Bowls	cc	1.0	x	8	=	8.0		
	Printed	2.8	x	3	=	8.4		
	Painted	1.6	x	10	=	10.6		
		TOTAL		21		27.0		
		AVERAGE VALUE			=	1.29	36%	
Cups	Painted	1.5	x	8	=	12.0		
	Printed	3.0	x	2	=	6.0		
		TOTAL		10		18.0		
		AVERAGE VALUE			=	1.8	17%	
Plates	cc	1.0	x	11	=	11.0		FEATURE 49
		TOTAL		11		11.0		LOT 20
		AVERAGE VALUE			=	1.0	25%	UNITS 5/6

*1814 Index Value

(continued)

CERAMIC TABLE 4.10 (continued)

Form	Type of Decoration	Index Value*		Number Recovered		Product		
Bowls	cc	1.0	x	10	=	10.0		
	Painted	1.6	x	9	=	14.0		
		TOTAL		19		24.0		
		AVERAGE VALUE			=	1.28	43%	
Cups	cc	1.0	x	1	=	1.0		FEATURE 49
	Painted	1.5	x	13	=	19.5		LOT 20
		TOTAL		14		20.5		UNITS 5/6
		AVERAGE VALUE			=	1.46	32%	

The commercial deposit in Feature 41 indicates the same trend for relative expenditure on cups, bowls, and plates as the domestic deposits. Plates represent the lowest relative value; cups and bowls are much higher. The index values are consistent with those in the domestic deposits. It should be noted that this deposit contained very little porcelain. It is possible that the low value of plates and higher value of cups and bowls is an indication of the inventory of the china and glass store that this deposit represents, and the clientele appealed to. It is equally possible that this deposit consisted of ceramic vessels broken in transit (shipments) or soon after arrival, and may not necessarily be representative of the complete store inventory. In fact, since this relatively large assemblage (over 8,000 sherds) may represent only one or two damaged shipments (Miller 1982: personal communication), it is questionable that it can be considered truly representative of the store's stock or of its clientele. The high percentage of decorated bowls (70%) in this feature, as opposed to cups and plates, may well be the result of differential breakage potential in vessel forms (see Miller 1980:13). In this case, in shipping as opposed to use, as well as ware types, both are unknown factors.

A comparison of Miller's graph (1982:14) and ceramic Figure 4.2 for the 175 Water Street assemblage, indicates distinct differences in relative expenditure levels. It appears that relatively high ceramic status indicators shifted from teaware and decorated tableware bowls during the late-eighteenth/early-nineteenth century. Decorated tableware sets, particularly transfer printed wares, become increasingly more prevalent toward the mid-nineteenth century (Miller 1980).

Summary and Conclusions

A total of 89,580 sherds were recovered from the excavation of the 175 Water Street block. Over 43,000 of these were recovered from the features, and the MNV count from this feature assemblage is 1,212. A total of 57 features were intensively analyzed; 28 are detailed in the text, and the remainder appear in Ceramic Table 4.11.

As discussed in the introduction to this section, the primary goals of the ceramic analysis were to identify the type of deposits found within features, and to determine chronological sequences of deposition. This information was available from 28 features; these included ten privies, five cisterns, five "wooden boxes", two barrels, two "living floors", two unidentified stone features, one drain, and one pit or yard deposit. Based on the criteria outlined in the introduction to this section, deposit types within these features have been defined as follows: three are commercial deposits (Features 34, 36 and 41); five are domestic (Features 30, 43, 49, 51, and 57); three are redeposited fill containing domestic refuse (Features 2, 31, and 50); and fifteen are redeposited fill (Features 1, 3, 4, 28, 32, 33, 35, 40, 42, 44, 46, 47, 48, 52, and 54).

Ceramic Table 4.11 175 WATER STREET: Ceramic Data, All Features

Feat. #	Lot	Feat. Type	Feat. Level	Sherd #	Datable Sherd #	MNV	Predominant Sherd Ware Types, # or %	Wear	Mends	Crossmends	Dates: Mean	Mode	Bracketed	CTPQ	Comments
1*	36	c	1	239	119	11	WP 58.2 WW 18.8 WE 8.8 WR 3.8	n		x	1821	1815	1650-1900	1844	Redeposited fill.
	36	c	2	32	18	1	WU 18.8 WP 18.8 WR 12.5 WL 12.5	n			1765	1733	1660-1860	1830	"
	36	c	9	39	11	0	WL 43.6 WU 17.9 WP 12.8	n			1740	1733	1630-1900	1740	Original landfill.
	36	c	TOTAL	310	148	12	WP 48.4 WW 58.0	n		x	1808	1815	1650-1900		See text.
2*	33	p	1	248	181	0	WC 37.5 WE 24.2	n			1793	1791	1670-1900	1820	Redeposited fill.
	33	p	2	528	257	6	WD 30.7 WC 18.8 WR 10.9 WU 9.5	s		x	1775	1791	1670-1900	1820	Refuse/redep. fill.
	33	p	9	90	30	1	WL 23.4 WU 20.0 WD 15.6 WR 12.2 WP 10.0 WT 10.0	n		x	1748	1733	1660-1820	1762	Original landfill.
	33	p	TOTAL	866	468	7	WC 26.7 WD 19.2 WP 10.2 WU 8.8	s		x	1780	1791	1660-1900		See text.
3*	33	c	1	356	204	4	WC 28.1 WP 14.0 WD 13.8 WR 13.5 WU 9.5	n			1781	1791	1670-1922	1800	Redeposited fill.
	33	c	2	260	100	2	WB 24.2 WC 18.5 WS 11.5 WU 7.7	n	x		1770	1791	1660-1860	1795	"
	33	c	9	402	196	10	WC 26.1 WR 18.4 WD 13.2 WT 10.2 WP 10.2 WL 9.5	n	x		1771	1791	1670-1860	1780	"
	33	c	TOTAL	1018	500	16	WC 24.9 WR 13.9 WD 11.9 WP 10.5	n	x		1775	1791	1660-1922	1800	See text.
4*	33	c	1	144	85	7	WC 25.0 WD 15.3 WT 15.3 WP 10.4	n			1775	1791	1670-1860	1795	Redeposited fill.
	33	c	2	74	45	1	WC 17.6 WR 27.0 WT 12.2 WP 10.8 WU 10.8	n			1775	1791	1670-1860	1800	"
	33	c	3	98	59	0	WC 23.5 WD 17.3 WT 17.3 WR 12.2	n			1776	1791	1670-1860	1795	"
	33	c	TOTAL	316	189	8	WC 22.8 WT 15.2 WD 14.6 WR 13.9 WP 13.9	n			1775	1791	1670-1860	1833	See text.
5	33	bt	1	236	131	1	WC 16.9 WD 16.1 WT 15.7 WR 11.0 WP 10.6 WE 9.3	n			1777	1791	1670-1900	1795	Engineering fill.
6	33	bt	1	6	3	0	WU 1 WR 1 WP 3 WE 1	n			1783	1815	1670-1830	1800	"
7	33	bl	1	8	8	0	WU 2 WE 5 WR 1	n			1801	1818	1740-1840	1795	Redeposited fill.
8	33	a	1	167	116	1	WC 32.3 WE 16.8 WR 16.8 WT 12.0	n			1786	1791	1670-1860	1795	"
9	33	a	1	49	16	1	WR 30.6 WP 28.6 WE 12.2	n			1796	1805	1670-1900	1820	"
10	33	a	1	0											Brick platform.
11	33	a	1	0											Wooden floor.
12	33	a	1	0											Wooden floor.
13	33	a	1	0											Metal assoc. w/F2
14	33	bt	1	112	73	1	WC 36.6 WU 13.4 WR 10.7 WT 10.7	n			1773	1791	1670-1840	1780	Engineering fill.
15	33	bt	1	18	13	0	WC 3 WE 4 WD 4 WP 1 WT 2 WU 2	n			1773	1818	1670-1840	1795	"
16	33	a	1	6	2	0	WC 2 WD 2 WP 2	n			1791	1791	1762-1820	1762	Brick floor.
17	33	a	1	416	204	1	WD 20.4 WR 13.0 WT 18.0 WU 17.3	n	x		1759	1733	1600-1840	1780	Wall Segment.
18	33	a	1	171	92	0	WC 23.4 WD 19.3 WT 10.5 WR 9.9	n			1773	1791	1670-1830	1790	"

(continued)

Ceramic Table 4.11 175 WATER STREET (continued)

Feat. #	Lot	Feat. Type	Feat. Level	Sherd #	Datable Sherd #	MNV	Predominant Sherd Ware Types, # or %	Wear	Mends	Crossmends	Dates Mean	Mode	Bracketed	CTPQ	Comments
19	33	a	1	50	23	0	WR 28.0 WC 24.0 WP 14.0	n			1772	1791	1670-1860	1780	Brick platform.
20	33	a	1	240	204	0	WC 41.7 WE 37.1	n			1796	1791	1650-1840	1818	Brick box/redep. fill.
21	33	bt	1	7	3	0	WC 6 WL 1	n			1791	1791	1762-1820	1762	Trench for box.
22	33	bt	1	5	4	0	WC 1 WE 1 WR 1 WL 1 WR 1	n			1783	1791	1720-1840	1795	Engineering fill.
23	33	a	1	106	85	0	WC 32.1 WE 39.6 WR 13.2	n			1799	1791	1670-1860	1800	Stone stoop.
24	33	bt	1	65	51	0	WC 44.6 WE 18.5	n			1783	1791	1670-1830	1790	Engineering fill.
25	33	bt	1	422	318	3	WC 34.6 WE 24.2 WP 11.6 WR 10.9	n			1789	1791	1650-1900	1800	"
26	33	a	1	25	20	0	WC 48.0 WE 32.0 WR 12.0	n			1798	1791	1762-1820	1780	Wall segment.
27*	33	lf	1	960	661	12	WC 44.7 WR 19.2 WE 13.7	n	x	x	1788	1791	1670-1900	1790	Redeposited fill. See text.
28*	33	lf	1	407	260	11	WC 27.8 WT 17.7 WR 16.7 WD 10.1	n	x		1769	1791	1660-1860	1780	"
29	33	bt	1	16	6	0	WP 25.0 WD 12.5 WT 12.5	n			1769	1763	1660-1820	1795	Engineering fill.
30*	32	bx	1	1202	935	3	WE 40.6 WC 31.1 WR 11.4	s		x	1798	1791	1650-1900	1795	Redeposited fill with domestic
	32	bx	2	301	241	3	WC 31.9 WE 31.2 WB 10.6 WR 7.6	s		x	1792	1791	1670-1860	1795	refuse. See text.
	32	bx	3	125	85	0	WT 34.4 WU 18.4 WP 11.2	n			1757	1733	1670-1860	1780	Redeposited fill.
	32	bx	4	124	86	2	WT 26.6 WP 23.4 WU 12.1 WR 11.3	h		x	1762	1780	1670-1860	1759	Transition to land-fill (?)
	32	bx	TOTAL	1752	1347	5	WE 33.3 WC 27.5 WR 10.3	s		x	1792	1791	1650-1900		See text.
31*	30	bl	1	197	167	5	WB 32.0 WT 25.4 WU 21.8	s	x	x	1752	1755	1670-1830	1780	Redeposited fill with domestic refuse.
	30	bl	2	6	3	0	WU 3 WG 2 WR 1	n			1733	1733	1670-1795	1670	"
	30	bl	TOTAL	203	170	5	WB 31.0 WT 24.6 WU 22.7	s	x	x	1752	1755	1670-1830	1780	See text.
32*	23	p	1	117	78	0	WC 24.8 WE 16.2 WK 13.7 WT 12.8 WD 10.3	n		x	1778	1791	1660-1840	1795	Redeposited fill. See text.
	23	p	2	1477	377	38	WK 56.3 WT 11.6 WD 8.1	n		x	1763	1763	1670-1840	1795	"
	23	p	3	10	2	0	WK 4 WR 2 WD 2 WE 1 WT 1	n		x	1779	1805	1740-1830	1780	"
	23	p	4	2	2	0	WC 1 WE 1	n		x	1798	1791	1762-1820	1795	"
	23	p	TOTAL	1606	459	38	WK 53.1 WT 11.6 WD 8.3 WC 6.1	n		x	1766	1763	1660-1840	1795	"
33*	23	u	1	327	159	9	WT 31.2 WD 24.8 WU 10.4	n		x	1757	1763	1670-1820	1762	Redeposited/disturbed. See text.
34*	23	pt	1	3186	1599	51	WK 34.5 WT 18.5 WU 13.4 WD 11.6	n		x	1755	1763	1650-1830	1795	Primary commercial deposit.
	23	pt	2	2807	1593	45	WK 30.5 WT 18.0 WU 24.9 WD 7.2	n		x	1749	1733	1650-1840	1795	"
34*	23	pt	3	5397	3032	258	WK 34.6 WT 13.9 WU 31.7 WD 6.9	n		x	1744	1733	1660-1860	1762	"
	23	pt	4	730	499	16	WT 28.4 WU 21.4 WD 16.8	n		x	1752	1733	1660-1860	1795	"
	23	pt	5	237	198	12	WU 62.0 WD 8.4	n		x	1742	1733	1670-1820	1795	"
	23	pt	TOTAL	12357	6921	382	WK 31.3 WU 24.5 WT 16.7 WD 8.8 WC 6.6	n		x	1748	1733	1650-1860	1795	See text.
35*	23	bx	1	1160	1068	72	WC 40.9 WE 47.2	n			1794	1805	1670-1860	1795	Redeposited fill.
	23	bx	2	165	136	1	WC 29.7 WE 25.5 WD 10.3	n			1780	1791	1670-1830	1795	"
	23	bx	TOTAL	1325	1204	73	WC 39.5 WE 44.5	n		x	1792	1805	1670-1830	1795	See text.

(continued)

Ceramic Table 4.11 175 WATER STREET (continued)

Feat. #	Lot	Feat. Type	Feat. Level	Sherd #	Datable Sherd #	MNV	Predominant Sherd Ware Types, # or %	Wear	Mends	Crossmends	Dates Mean	Mode	Bracketed	CTPQ	Comments
36*	23	bx	1	2060	1624	96	WC 44.2 WE 32.6	h/n	x	x	1796	1791	1670-1840	1795	Combination primary deposit.
	23	bx	2	153	132	0	WE 31.4	h/n	x	x	1770	1805	1670-1830	1795	"
	23	bx	TOTAL	2213	1756	96	WC 41.5 WE 32.5 WP 11.5 WR 10.9	h/n	x	x	1794	1791	1670-1840	1795	See text.
37	23	bl	1	33	24	1	WC 30.3 WE 27.3 WU 12.1	n			1785	1791	1670-1830	1795	Redeposited fill.
38*	23	c	1	157	138	0	WC 41.4 WE 36.9	n			1792	1791	1670-1840	1795	"
	23	c	2	192	149	0	WC 34.4 WE 28.1	n		x	1788	1791	1670-1840	1795	"
	23	c	TOTAL	349	287	0	WC 37.5 WE 32.1 WT 7.7	n			1790	1791	1670-1840	1795	See text.
39	23	bt	1	177	151	0	WC 46.9 WE 31.1	n			1792	1791	1670-1840	1795	Engineering fill.
40*	23	u	1	288	256	0	WE 61.5 WR 10.1 WU 8.3 WC 6.9	n			1791	1805	1660-1840	1795	Redeposited fill.
	23	u	2	259	145	0	WK 21.6 WB 17.8 WD 17.0 WT 17.4 WU 15.1	n			1754	1755	1670-1830	1795	"
	23	u	3	388	255	7	WR 20.4 WT 19.8 WK 17.5 WU 14.7	h		x	1755	1760	1650-1830	1795	"
	23	u	9	0	0	0									
	23	u	TOTAL	935	656	7	WE 19.3 WT 14.2 WK 13.8 WU 12.8 WR 12.0	n		x	1769	1805	1650-1840	1795	See text.
41*	22	p	1	7074	6626	244	WC 48.9 WE 37.6	n	x	x	1794	1791	1650-1860	1795	Primary commercial.
41*	22	p	2	781	591	5	WC 24.6 WT 24.2 WU 14.6	n		x	1769	1791	1660-1860	1795	Transition.
	22	p	9	528	139	6	WG 66.0 WT 16.5	n			1755	1733	1670-1820	1762	Original landfill.
	22	p	TOTAL	8383	7356	255	WC 43.6 WE 32.6 WT 6.4	n	x	x	1791	1791	1650-1860		See text.
42*	21	p	1	37	28	0	WC 51.4 WE 16.2 WR 10.8	n			1790	1791	1670-1840	1795	Redeposited fill.
	21	p	2	237	147	0	WC 23.6 WT 15.2 WE 11.8 WU 10.1	n			1777	1791	1670-1840	1795	"
	21	p	9	375	211	6	WU 30.9 WR 13.6 WT 12.0 WL 10.7	n		x	1750	1733	1660-1860	1795	Transition/landfill.
	21	p	TOTAL	649	386	6	WU 21.7 WC 15.6 WL 9.9 WT 12.6 WR 10.8	n			1763	1733	1660-1860	1795	See text.
43*	21	p	1	390	254	1	WC 30.0 WE 15.6 WD 10.0 WT 9.2 WU 8.2	n			1784	1791	1670-1900	1820	Redeposited fill.
	21	p	2	1417	1258	73	WC 51.7 WE 33.5	s	x	x	1795	1791	1670-1860	1795	Primary domestic.
	21	p	3	184	90	2	WU 23.4 WP 15.2 WT 13.0	n		x	1748	1733	1660-1860	1780	Redeposited fill.
	21	p	9	65	28	0	WL 26.2 WU 21.5 WT 15.4	n			1751	1733	1670-1820	1762	Original landfill.
	21	p	TOTAL	2056	1630	76	WC 41.8 WE 26.3 WP 5.9	s	x	x	1790	1791	1660-1900		See text.
44*	21	p	1	168	78	0	WU 18.5 WR 17.3 WP 13.1	n			1762	1733	1670-1840	1800	Redeposited fill.
	21	p	9	30	9	0	WL 33.3 WD 20.0 WU 20.0	n			1735	1733	1650-1805	1720	Original landfill.
44*	21	p	TOTAL	198	87	0	WU 18.7 WR 14.6 WP 13.1 WD 13.1	n			1759	1733	1650-1840		See text.
45	21	d	1	8	5	0	WC 2 WE 1 WR 2 WU 1 WS 1 WL 1	n			1776	1791	1670-1830	1780	20th century redeposited fill.
46*	21	d	1	95	62	1	WC 31.6 WD 14.7 WE 12.6	n		x	1779	1791	1660-1860	1795	Redeposited fill.
47*	20	p	1	8	3	0	WR 3 WU 2 WP 1 WT 1 WG 1	n			1743	1733	1670-1795	1744	Redeposited fill.
	20	p	2	21	10	0	WT 23.4 WE 19.0 WR 14.3 WC 9.5	n			1785	1805	1720-1830	1795	"
	20	p	3	56	32	0	WU 21.4 WC 14.3 WT 12.5 WR 10.7	n			1757	1733	1670-1830	1762	"
	20	p	TOTAL	85	45	0	WU 16.5 WT 15.3 WR 14.1 WC 11.8	n			1762	1733	1670-1820		See text.

(continued)

Ceramic Table 4.11 175 WATER STREET (continued)

Feat. #	Lot	Feat. Type	Feat. Level	Sherd #	Datable Sherd #	MNV	Predominant Sherd Ware Types, # or %	Wear	Mends	Crossmends	Dates Mean	Mode	Bracketed	CTPQ	Comments
48*	20	p	1	84	53	0	WC 32.1 WE 11.9 WR 11.9 WP 11.9	n			1779	1791	1660-1830	1795	Redeposited fill.
	20	p	2	319	215	2	WC 36.7 WE 14.1 WP 15.0 WR 6.6	n			1784	1791	1670-1900	1795	"
	20	p	9	21	4	1	WN 23.8 WD 19.0 WU 14.3 WR 9.5	n			1734	1733	1670-1795	1690	Original landfill.
	20	p	TOTAL	424	272	3	WC 34.0 WP 13.9 WE 13.0 WU 8.0	n			1782	1791	1660-1900		See text.
49*	20	cb	1	1835	1514	69	WC 48.3 WE 21.1	h/s	x	x	1786	1791	1650-1840	1795	Primary domestic.
	20	cb	2	30	28	1	WC 36.7 WE 53.3	h/s	x	x	1794	1800	1670-1820	1795	"
	20	cb	3	70	43	1	WC 31.4 WU 17.1 WT 8.6 WE 5.7	h/s	x	x	1771	1791	1670-1820	1795	"
	20	cb	9	11	0	1	WR 81.8 WP 18.2				N/A	N/A	N/A	N/A	Original landfill.
	20	cb	TOTAL	1946	1585	72	WC 47.3 WE 20.9	h/s	x	x	1786	1791	1650-1840		See text.
50*	19	p	1	440	262	12	WC 25.7 WP 25.0 WU 23.0	h	x	x	1764	1791	1670-1900	1820	Redeposited w/refuse.
	19	p	9	57	33	0	WC 42.1 WP 15.8 WL 12.3 WU 10.5	n			1778	1791	1670-1820	1762	Original landfill.
	19	p	TOTAL	497	295	12	WC 27.6 WP 23.9 WU 21.5	h			1766	1791	1670-1900		See text.
51*	18	p	1	359	258	24	WC 42.1 WP 17.3 WE 14.5	h		x	1784	1791	1660-1860	1780	Primary domestic.
	18	p	2	97	49	1	WU 33.0 WR 14.4	n			1747	1733	1660-1830	1780	Redeposited fill.
	18	p	9	6	4	0	WU 2 WR 1 WD 1 WP 2	n			1741	1750	1670-1795	1720	Original landfill?
	18	p	TOTAL	462	311	25	WC 33.5 WE 11.7 WP 14.3 WU 12.1	n			1777	1791	1660-1860		See text.
52*	18	bx	1	32	25	0	WC 50.0 WE 21.0	n			1791	1791	1700-1830	1780	Redeposited fill.
	18	bx	2	41	27	2	WC 53.7 WR 31.7	n			1789	1791	1670-1840	1795	"
	18	bx	9	13	7	0	WU 5 WR 2 WP 2 WG 2 WC 1 WT 1	n			1740	1733	1670-1805	1740	Original landfill?
	18	bx	TOTAL	86	59	2	WC 45.3 WR 19.8 WE 11.6	n			1784	1791	1670-1840		See text.
53	18	u	1	37	15	0	WD 29.7 WU 27.0 WE 5.4 WP 5.4	n			1751	1733	1670-1830	1780	Redeposited fill?
54*	18	c	1	49	22	0	WC 18.4 WR 18.4 WU 12.2 WE 12.2	n			1779	1791	1670-1840	1795	Redeposited fill?
	18	c	2	19	9	0	WU 36.8	n			1740	1733	1670-1805	1720	Original landfill.
54*	18	c	TOTAL	68	31	0	WU 19.1 WR 16.2 WC 13.2 WP 10.3 WD 10.3	n			1767	1733	1670-1840		See text.
55	93	dt	1	141	62	0	WT 24.8 WP 24.1 WR 12.1 WU 9.9				1757	1763	1670-1860	1780	Landfill.
	93	dt	2	113	51	0	WT 21.2 WD 15.0 WL 15.9 WP 15.9 WU 10.6				1758	1763	1670-1900	1744	"
	93	dt	3	49	21	0	WP 20.4 WT 20.4 WU 18.4 WD 14.3				1750	1733	1670-1860	1744	"
	93	dt	4	37	15	0	WL 24.3 WU 18.9 WR 13.5 WT 13.5				1751	1733	1670-1860	1744	"
56	93	dt	1	73	37	0	WU 21.9 WT 17.8 WR 16.4 WD 16.4 WP 11.0				1751	1733	1670-1860	1759	Landfill.
	93	dt	2	96	42	0	WT 24.0 WU 16.7 WP 14.6 WR 12.5 WD 9.4				1751	1733	1670-1805	1744	Landfill.
	93	dt	3	25	12	0	WT 28.0 WR 20.0 WU 20.0 WD 16.0				1750	1733	1670-1805	1744	"
	93	dt	4	24	11	0	WD 37.5 WT 20.8 WR 16.7 WP 8.3 WU 8.3				1748	1762	1650-1805	1744	"
57*	33	bl	1	197	122	22	WC 42.1 WP 24.4 WE 9.1 WD 8.6	s	x	x	1787	1791	1670-1860	1800	Primary domestic.
	33	bl	9	21	12	0	WT 23.8 WU 23.8 WP 19.0	n	x	x	1748	1733	1670-1820	1762	Original landfill.

(continued)

Ceramic Table 4.11 175 WATER STREET (continued)

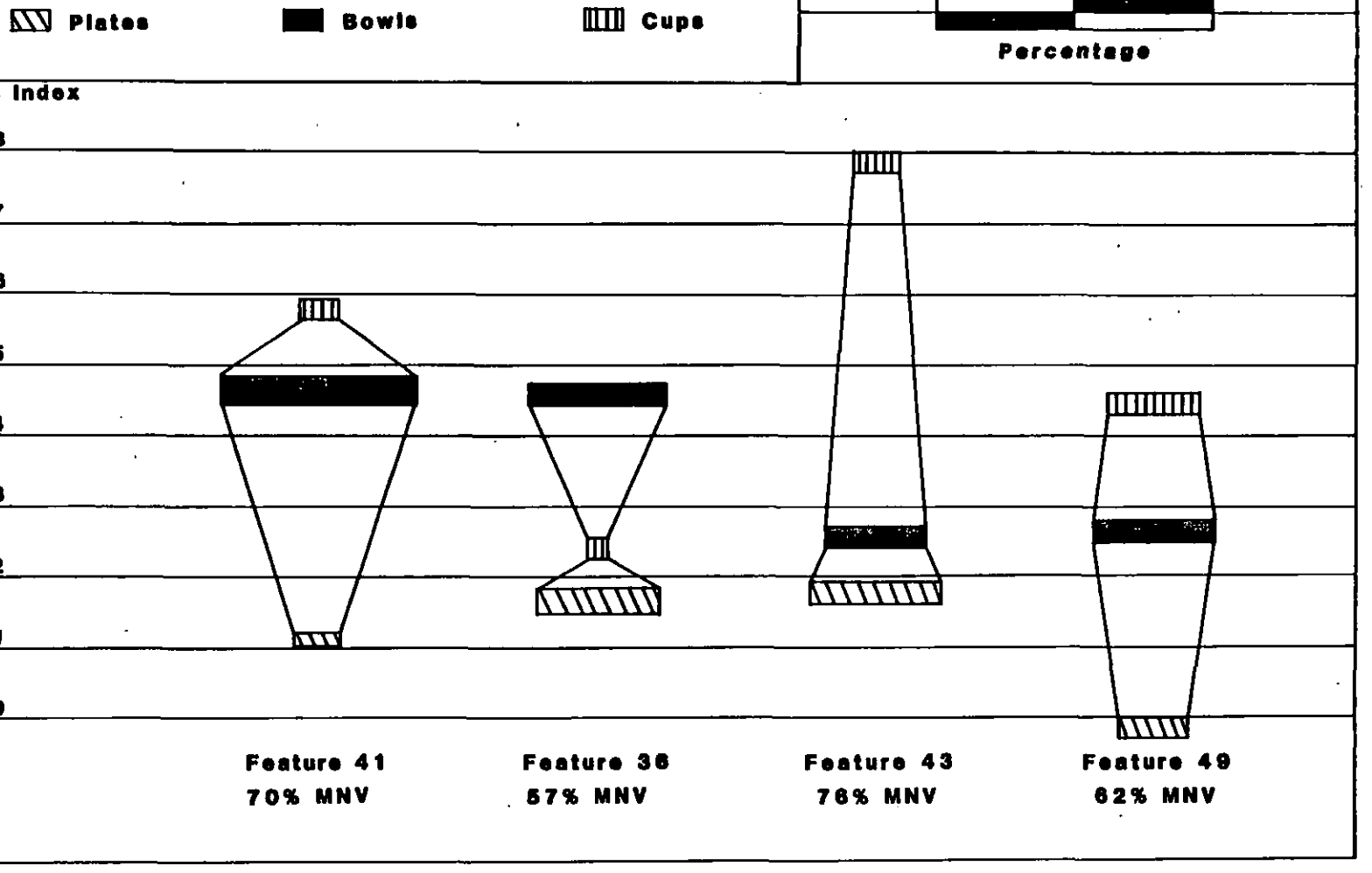
*Appear in text
x=Present in feature

Feature Types: p=privy; c=cistern; bt=builder's trench; d=drain; bl=barrel; pt=pit; cb=cofferdam/box; bx=box; a=architectural; dt=deeptest; u=unidentified; lf=living floor

Wear Patterns: h=very heavy; s=slight; w=waterworn/rolled; f=flawed/kiln damaged; n=none

Figure 4.2
175 WATER STREET

The Average Cost of Plates, Bowls and Cups Above the Cost of CC Ware for Four Features (1814 Scale Year) (After Miller 1980)



The chronological data provided by the deposits within these features appear in the text discussions. Mean, modal, and bracketed dates were generated for levels within features and for the features themselves. Because of the mixed nature of the deposits within most analyzed features, the decision was made to use the beginning manufacture date of the newest ceramic present (ceramic terminus post quem, [CTPQ]), as the most valid for the deposit. In general, based on their CTPQ, most of the features appear to post-date 1795. (Traces of earlier privy deposits, subsequently cleaned out prior to later filling, also may be represented; the vastness of the collection, however, prohibited analysis by individual strata which might have determined these components.)

The three defined commercial deposits mentioned above comprise over half the feature sherd assemblage (22,953) from the site. These features also produced over three quarters of the site MNV count (833). The documentary evidence provided historical data to assign possible commercial origins to these deposits (see Lot Histories section, Chapter 2).

Feature 41, the large stone privy located in Lot 22 Unit 2, produced 8,383 sherds and a MNV count of 255. The documentary record for Lot 22 lists four known commercial occupations that may relate to this deposit. These are: the "china store" of Hawxhurst and Mowatt (1789-1796); the "looking glass store" of Dunlap and Judah (1799); the "glass and china store" of William N. Kettletas; and the "china store" of James Burling (1816-1826) (see Lot Histories section, Chapter 2). It is not possible to attribute the feature deposit to a specific firm as the date range of the ceramics, including those with maker's marks, approximates that of all known occupations (1789-1826).

Feature 34, the pit or yard deposit located in Lot 23 Unit 4, produced 12,357 sherds and a MNV count of 382, the highest of any on the site. A documented commercial occupation from this lot may be related to this feature deposit: The documentary record states that a Garret Kettletas opened a "china and glass store" on this site in 1809. Based on the presence of pearlware in all feature levels, the CTPQ for this deposit is 1795; however, most of the ceramics in this deposit were primarily of early to mid-eighteenth-cenutury manufacture. The maker's marks probably attributable to Samuel Malkin, as well as the delftware marked "Pitt and Liberty", date to the early to mid-eighteenth century. This feature deposit may represent the primary deposition after 1795 of old goods shipped to the colonies. It is known that British manufacturers of the early-nineteenth century sent old goods to foreign markets. "In 1815 British manufacturers disposed of their backed-up inventories by "dumping" them in the New York market. Enterprising New York merchants encouraged this trade by securing passage of a law which decreased taxes on auctions and guaranteed that goods would be sold to the highest bidder." (Porter and Livesay 1971:21). This deposit suggests that manufacturers may have employed these tactics in the late-eighteenth century as well.

Feature 36 was a small wooden box also located in Lot 23 Unit 4. It produced 2,213 sherds and a MNV count of 96. As was the case for Feature 34, the commercial component of this deposit may be related to the documented 1809 china and glass store of Garret Kettletas.

The Miller Model was applied to both commercial and domestic features in an effort to compare the relative expenditure levels represented. It appears, however, that relative value trends are the same for both deposit types; low plate values and high cup and bowl values were found throughout (see Figure 4.3). It should again be noted that not all of the vessels from these features were applicable to the Miller Model; further research into the relative values for ware types not indexed by Miller may alter the conclusions drawn here.

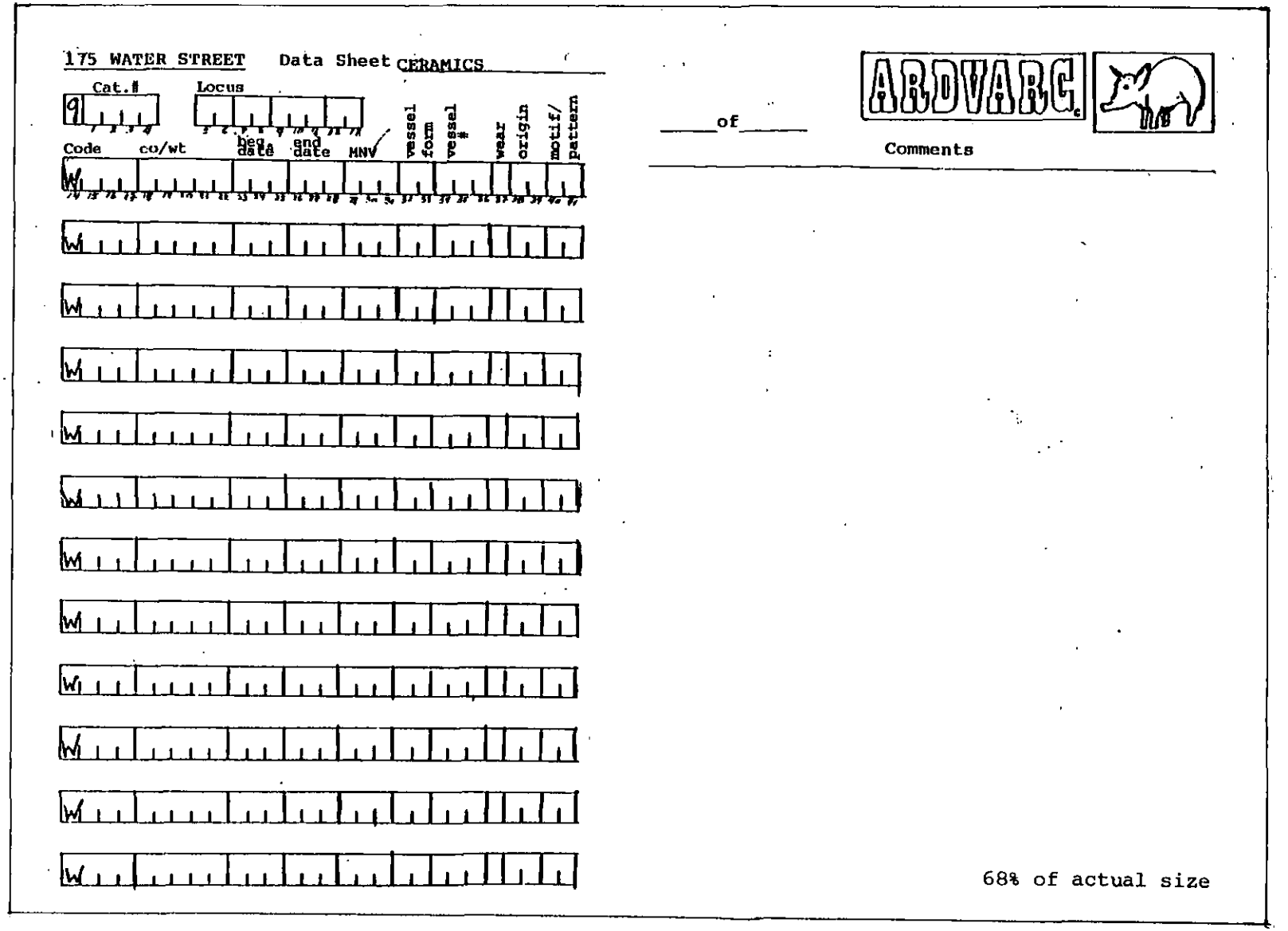
Comparisons between commercial and domestic deposits based on vessels present must allow for the various behavioral activities responsible for the vessels' entry into the archaeological record. Domestic deposits are probably the result of household use and subsequent breakage (see Miller 1982:13); commercial deposits may result from damage in transit or the discarding of old stock, both circumstances resulting in the presence of unused vessels. The presence or absence of wear marks attributable to use are therefore important in the interpretation of feature deposit types.

In addition to chronologies and status, trade networks were a consideration in the ceramic analysis. Theoretically, it is possible to determine trade networks and address questions regarding economics through a study of the countries of origin from a given ceramic assemblage. As mentioned previously, the bulk of the ceramic assemblage has been attributed to English manufacture; the lack of marked vessels makes it difficult, if not impossible, to greatly expand this assessment. With the exceptions of German stonewares, French faience, Chinese porcelain, and probable Dutch delftware, little evidence was found to refute the assumption that the ceramics from this assemblage were primarily of British manufacture.

In addition to the identification of 43,232 sherds, analysis of the ceramic assemblage from the 175 Water Street feature deposits has met the goals outlined in the introduction to this section. Deposit types have been successfully identified; chronologies have been determined; Miller's Model has been applied to selected features; and trade networks have been examined. Of these, the identification of trade networks was the least successful aspect of the analysis. On the other hand, the determination of type of feature deposits was more rewarding than had been anticipated. While the research presented here has been fruitful, the colleciton could, and should, be used to address many more research questions.

Figure 4.3
175 WATER STREET

Ceramics
Computer Data Entry Form (ARDVARC)



Ceramic Table 4.12 175 WATER STREET: Ceramic Code Translations

Code	Transaction		Dates From	*	To
WA00	Salmon body Eware				
WA80	Salmon B Mustard Glaze				
WA81	Salmon B Green Glaze				
WA98	Other Salmon Body Eware				
WB00	Brown Salt GL Stoneware				
WB01	Brown Stoneware Bottles		800		900
WB46	Nottingham Stoneware		700		810
WB52	Burslem Crouch SW Mugs		700		779
WB53	Brown Salt GL SW Mugs		690		783
WB54	Other British Brown SW		690		783
WB66	Debased Bellarmine SW		620		700
WB74	Well Molded Bellarmine SW		550		625
WB75	Cologne Type Rhenish SW		540		600
WB80	Tigerware German SW				
WB81	Bristol Brown Bottles		850		900
WB98	Other Brown Stoneware				
WC00	Creamware	762	820		
WC08	Finger Painted Creamware		790		820
WC14	Annular Creamware	780	815		
WC18	Overglaze Enamel Painted CW		765		810
WC22	Undec Creamware	762	820		
WC23	Transfer Printed Cream W		765		815
WC33	Green Glazed Cream Bodied		759		779
WC36	Clouded Mottled GL Cware		740		770
WC41	Littler's Blue Dec Cware		750		765
WC78	Luster Dec Creamware		800		820
WC80	Other Molded Creamware		762		820
WC81	Shell Edge Creamware		780		820
WC82	Feather Edge Creamware		762		820
WD00	Tin Enameled Ware	625	802		
WD21	Debased Rouen Faience		775		800
WD32	Pedestal Ft Delft Ointment		730		830
WD45	Everted Rim Delft Ointment		700		800
WD49	Decorated Delftware	625	802		
WD57	Plain Delft Washbasins		750		800
WD62	English Blue Dash Charger		620		720
WD64	Cylindrical Delft Ointment		630		700
WD65	Plain Undec Delftware		640		800
WD76	Delft Chamber Pots	660	800		
WD80	Delft Tiles				
WD81	Overgl Enamel Delftware				
WD82	Polychrome Dec Delftware				
WD83	Majolica-Lead GL Obverse				
WD98	Other Tin Enameled				
WE00	Pearlware	780	840		

Ceramic Table 4.12 (continued)

Code	Transaction	Dates From	Dates To
WE04	Undergl Poly Stenciled PW	820	840
WE06	Mocha Dec Pearlware	795	840
WE08	Finger Painted Pearlware	790	820
WE09	Embossed Pearlware	800	820
WE10	Willow Transfer Pearlware	795	840
WE11	Transfer Printed Pearlware	795	840
WE12	Underglaze Polychr Pearlware	795	815
WE13	Annular Pearlware	790	820
WE17	Undergl Blue Painted PW	780	820
WE19	Blue or Green Edge Pearlware	780	830
WE20	Undecorated Pearlware	780	830
WE81	Overglaze Dec Pearlware	780	840
WE98	Other Dec Pearlware	780	840
WG80	Burned-unidentifiable		
WG81	Spalled-Unidentifiable		
WG82	Waterworn-Unidentifiable		
WG83	Other Earthenware		
WG84	Other Ceramic		
WG85	Other Stoneware		
WG86	Spalled Delftware	625	802
WG87	Burned Delftware	625	802
WH00	White/Buff Bodied Earthware		
WH80	White/Buf-Mottled Green GL		
WH81	Whi/Buf-Apply Green Glaze		
WH82	Whi-Green Ext Yellow INT		
WH83	Whi-Clear yellow glaze		
WH84	Whi/Mottled Brown Glaze		
WH98	Other White/Buff Earthenware		
WK00	Pink/White Body Slipware		
WK80	Pink/White-Monochrome Dec Slipware		
WK81	Pink/White-Combed Dec Slipware		
WK82	Pink/White-Linear Trailed Slipware		
WK83	Pink/White-Dotted Dec Slipware		
WK84	Pink/White-Non L Trailed Slipware		
WK85	Pink/White-Tri Color Trail Slipware		
WK98	Other Pink/White Body Slipware		
WL00	Blue/Gray Stoneware		
WL44	Westerwald Gray Saltgl SW	700	779
WL58	Rhenish Gray Salt GL SW	650	725
WL77	Westerwald Chamber Pot	700	779
WL80	Blue/Gray Unglazed Stoneware		
WL81	Blue/Gray Salt Glazed SW		
WL82	Drab Body Salt Glazed SW		
WL83	Blue Dec Gray Saltglaze SW		

Ceramic Table 4.12 (continued)

Code	Transaction	Dates From	Dates To
WL84	Gray Saltgl Brown Slip SW		
WL98	Other Blue/Gray Stoneware		
WN27	Black Basaltes Stoneware	750	820
WN28	Engine-Turned Ungl Red SW	763	779
WN37	Refined Sprigged Red SW	690	779
WN80	Engine-Turned Clear Gl Red SW		
WN81	Red Body-Clear Lead GL SW		
WN82	Red Body-Opaque Glaze SW		
WN83	Turner's Type Molded SW	785	825
WN84	Gray SW-Tin Enamel/Slip		
WN98	Other Non Salt GL StoneW		
WP00	Porcelain		
WP05	Canton/Nanking HP Porc	800	830
WP31	Soft Past Porcelain		
WP39	Undergl Blue Painted HP		
WP41	Littler's Blue Dec Porc	750	765
WP80	Plain Undec HP Porcelain		
WP81	Undergl Blue Brown Rim HP	700	860
WP82	Undergl Blue Brown Ext HP	720	780
WP83	Overgl Enamel HP Porc		
WP87	Imari Style Dec HP Porc		
WP98	Other Porcelain		
WR00	Red Earthenware		
WR29	Jackfield Ware	740	780
WR35	Coarse Agate Ware	750	810
WR38	Iberian Storage Jar	745	780
WR42	Refined Agate Ware	740	779
WR47	Buckley Ware	720	779
WR51	Astbury Ware-White Sprigg	725	750
WR61	North Devon Gravel Temper	650	779
WR78	Luster Dec Red Earthenware	790	840
WR80	Red EW-Clear Lead Glaze		
WR81	Red EW-Blk/Dk Brn Lead GL		
WR82	Red EW-Brown Lead Glaze		
WR83	Bright Red EW-Blk/Brn GL		
WR84	Red EW-Green Glaze		
WR85	Red EW-Green/Ginger Glaze		
WR88	Red EW-Speckled Lead GL		
WR97	Red EW-Spalled Glaze		
WR98	Other Red EW- Inc Unglazed		
WS00	Red Bodied Slipware		
WS68	Metropolitan Red Slipware	630	660
WS80	Bi/Tri Color Red Slipware		
WS81	Red Slpw-Color Over White		
WS82	Red Slpw-Sgraffito Dec		

Ceramic Table 4.12 (continued)

Code	Transaction	Dates From	To
WS82	Red Slpw-Color and Trail		
WS98	Other red bodied Slipware		
WT00	White Salt GL Stoneware	720	805
WT16	Molded White Salt GL SW	740	765
WT24	Debased Scratch Blue SW	765	795
WT30	Transfer White Salt GL SW	755	765
WT34	Scratch Blue Stoneware	744	779
WT40	Plain White Salt GL SW	720	805
WT41	Littler's Blue Stoneware	750	765
WT43	White Salt GL SW Plates	740	779
WT48	Slip-Dipped Wh Salt GL SW	715	779
WT55	Scratch Brown or Trailed	720	730
WT80	Overgl Dec Wh Salt GL SW	720	805
WT98	Other White Salt GL SW		
WU00	Buff Bodied Slipware	670	795
WU56	Buff B-Trail/Comb Linear	670	795
WU63	N Devon Sgraffito SlipW	650	710
WU67	Wrotham Slipware	612	700
WU80	Buff Slipw-No Dec Present	670	795
WU81	Buff B-Non Linear Trailed	670	795
WU82	Buff B-Dotted Slip Dec	670	795
WU83	Buff B-Reverse Slip Dec	670	795
WU98	Other Buff Bodied SlipW		
WW00	Whiteware	820	900
WW02	Plain Whiteware	820	900
WW03	Ironstone/Granite China	813	900
WW06	Mocha Dec Whiteware	820	890
WW80	Transfer Printed WhiteW	830	860
WW81	Flow Blue Transfer WhiteW	844	860
WW82	Jasperware	783	950
WY00	Yellow/Buff Body Eware		
WY35	Coarse Agate Ware		
WY42	Refined Agate Ware		
WY80	Buff Body Clear Lead GL		
WY81	Midlands Ware	660	750
WY82	Buff Body Black Lead GL		
WY83	Rockingham Type		
WY84	American Rockingham	812	900
WY85	Flint Enamel Bennington		
WY86	Yellow Ware	827	922
WY98	Other Yellow/Buff Body EW		

* The digit 1 has been deleted from the table, e.g. 750 indicates the year 1750.

Ceramic Table 4.13 175 WATER STREET: Vessel Forms

CODE	VESSEL FORM	CODE	VESSEL FORM
1	Flatware	31	Creamer
2	Hollow-ware	32	Tea Pot
3	Platter	33	Coffee Pot
4	Plate Over 10 in.	34	Pitcher
5	Plate, Table 10 in.	35	Jug
6	Plater, Supper 9 in	36	Bellarmine
7	Plate, Twiffler 8 in.	37	Cream Pan
8	Plate, Muffin 7 in.	38	Storage Jar
9	Plate, Muffin 6 in.	39	Wash Basin
10	Plate, Muffin 5 in.	40	Chamber Pot
11	Plate, Muffin 4 in	41	Bottle
12	Saucer	42	Cauliflower Shape
13	Soup Plate	43	Pineapple Shape
14	Teacup with Handle	44	Flower Pot
15	Teacup no Handle	45	Pipkin
16	Tea Bowl/Cup	46	Colander
17	Coffee Cup	47	Galley Pot
18	Coffee Can	48	Candle Stick
19	Mug	49	Lidded Bowl
20	Tankard	50	Basket
21	Tyge	51	Vase
22	Posset Type Cup	52	Figurine
23	Low Bowl 5 in	53	Lid
24	Bowl Under 4 in.	54	Salt Cellar
25	Bowl 4 in.	55	Bowl no Specs.
26	Bowl 5 in.	56	Cup no Specs.
27	Bowl 6 in.	57	Plate no Specs.
28	Bowl over 6 in.	58	Dessert Cup
29	Tureen	59	Serving Dish 12-14 in.
30	Gravy/Sauce Boat	60	Ointment/Powder Jar
		61	Ladle

After Cushion (1976) and Noel Hume (1969)

Ceramic Table 4.14 175 WATER STREET: Categories of Vessel Forms

Code	Food Preparation/Storage	Code	Food Service
18	Coffee Can	3	Platter
28	Bowl Over 6 in.	4	Plate Over 10 in.
35	Jug	5	Plate-Table 10 in.
36	Bellarmine	6	Plate-Supper 9 in.
37	Cream Pan	7	Plate-Twiffler 8 in.
38	Storage Jar	8	Plate-Muffin 7 in.
41	Bottle	9	Plate Muffin 6 in.
45	Pipkin	10	Plate-Muffin 5 in.
		11	Plate-Muffin 4 in.
	Personal Hygiene	12	Saucer
		13	Soup-Plate
39	Wash Basin	14	Tea Cup with Handle
40	Chamber Pot	15	Tea Cup no Handle
41	Galley Pot	16	Tea Bowl/cup
60	Ointment/Powder Jar	17	Coffee Cup
		19	Mug
	Decorative/Other	20	Tankard
		21	Tyge
44	Flower Pot	22	Posset Type Cup
48	Candle Stick	23	Low Bowl 5 in.
49	Lidded Bowl	24	Bowl Under 4 in.
50	Basket	25	Bowl 4 in.
51	Vase	26	Bowl 5 in.
52	Figurine	27	Bowl 6 in.
		29	Tureen
	General	30	Gravy/Sauce Boat
		31	Creamer
1	Flatware	32	Tea Pot
2	Hollow-ware	33	Coffee Pot
53	Lid	34	Pitcher
55	Bowl no Specs.	54	Salt Cellar
56	Cup no Specs.	58	Dessert Cup
57	Plate no Specs.	59	Serving Dish 12-14 in.
		61	Ladle

Ceramic Table 4.15 175 WATER STREET: Ceramic Wear Codes

CODE	
1	very heavy wear
2	heavy wear
3	slight wear
4	no wear
5	water worn or rolled
8	flawed, kiln damaged

Ceramic Table 4.11 175 WATER STREET: Ceramic Motif/Pattern Codes

CODE	
1	floral
2	geometric
3	landscape
4	chinoiserie
5	dot-diaper-basket
6	royal rim
7	King of Prussia
8	neo-classical
9	William Pitt
10	barley
11	bead and reel
12	marbleized
13	feather edged

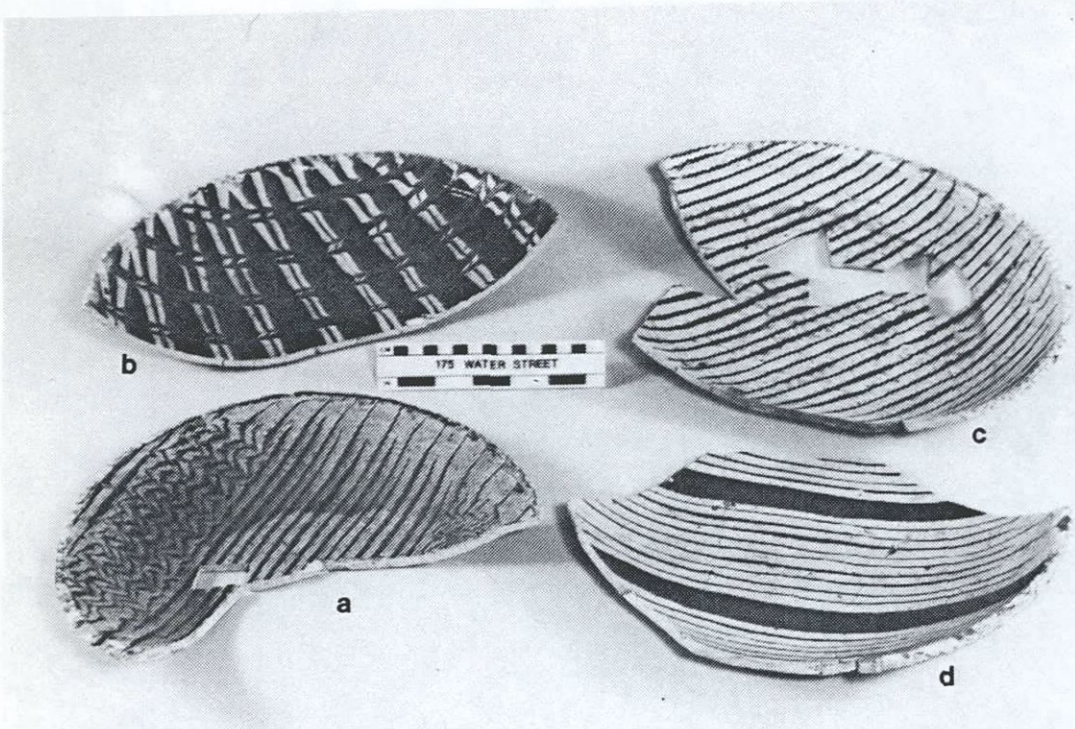


Plate 4.9: Feature 34: pink/white bodied slipware serving dishes, pie crust type rims a) combed white over brown slip, heavy kiln damage on rim b) tri-color slip in double lattice pattern c) trailed white over brown slip, molded "SM" on interior d) trailed white over brown slip.

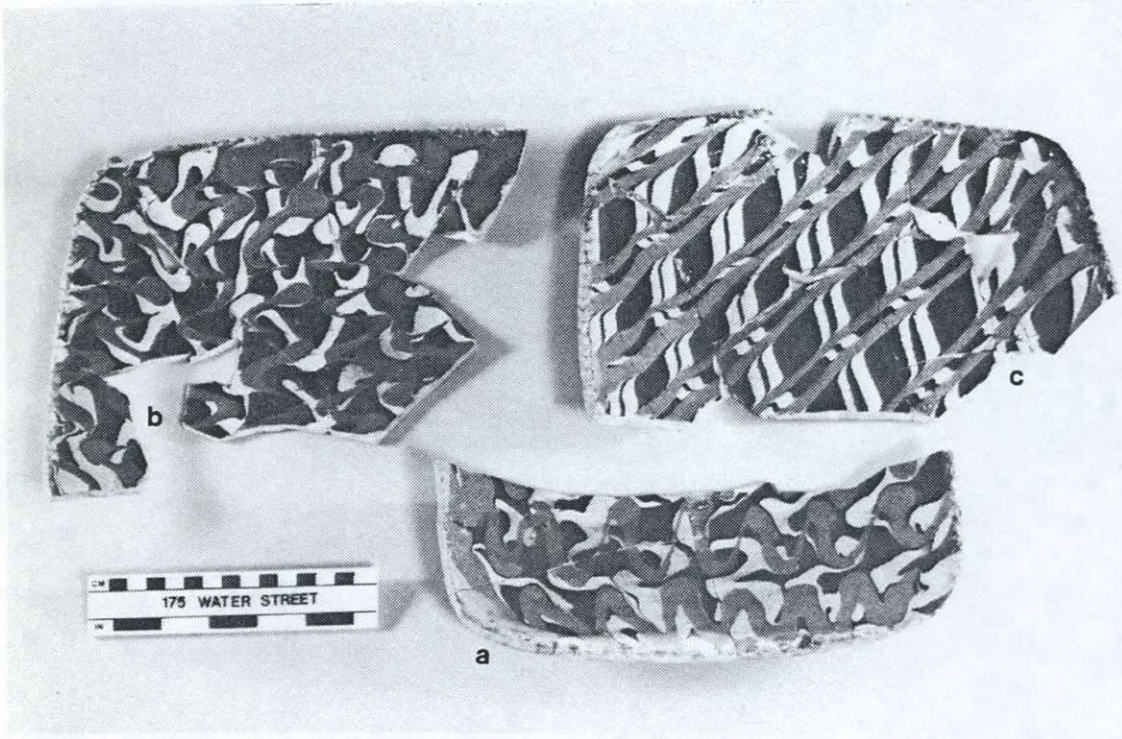


Plate 4.10: Feature 34: pink/white bodied tri-clor trailed slipware platters, pie crust type rim a) trailed and swirled b) trailed and swirled with molded "SM" on interior c) trailed lattice pattern.

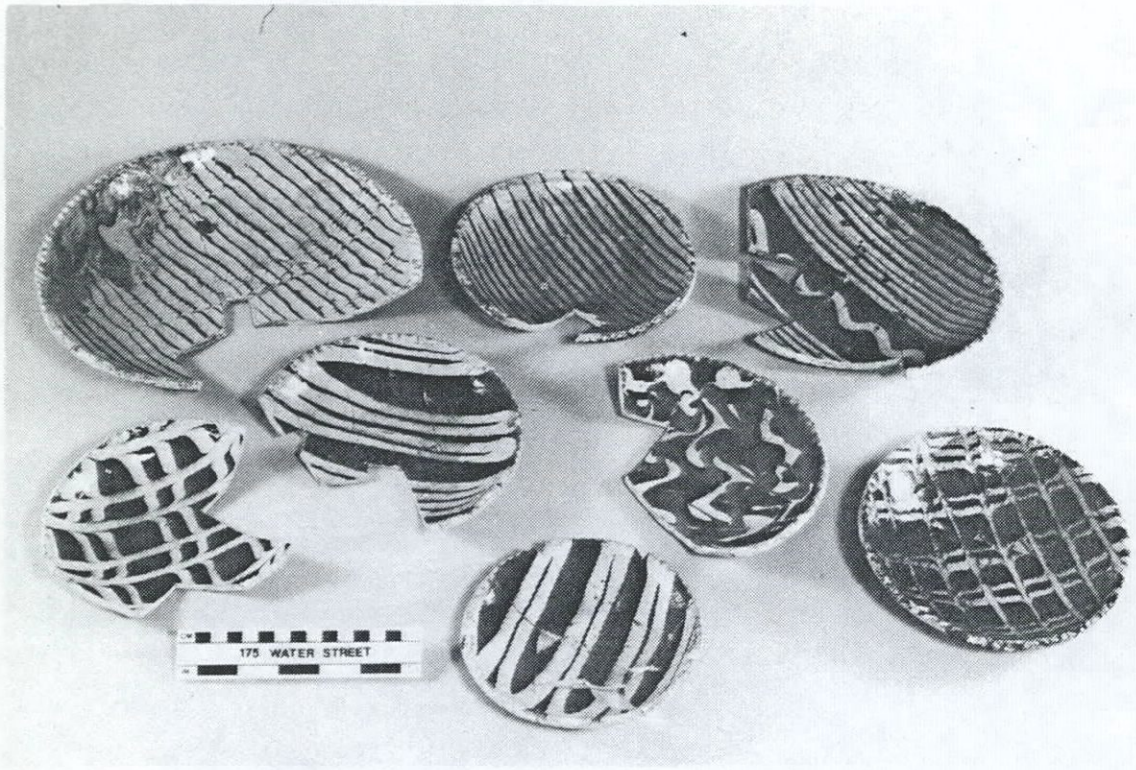


Plate 4.11: Feature 34: slip decoration on 7-11 inch diameter buff bodied and pink/white bodied plates.



Plate 4.12: Feature 34: brown slip decoration patterns on buff bodied cups and pots.

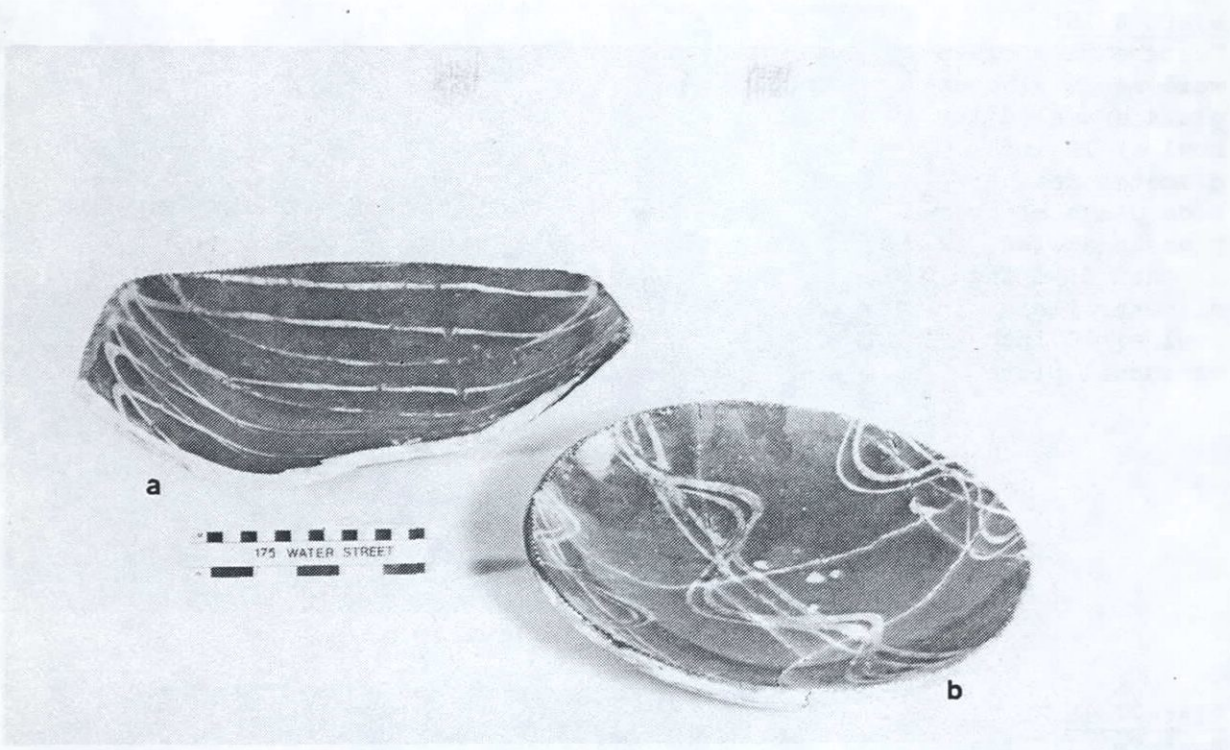


Plate 4.13: Feature 36: trailed white slip decoration on red bodied vessels with pie crust type rims a) rectangular platter b) serving dish.

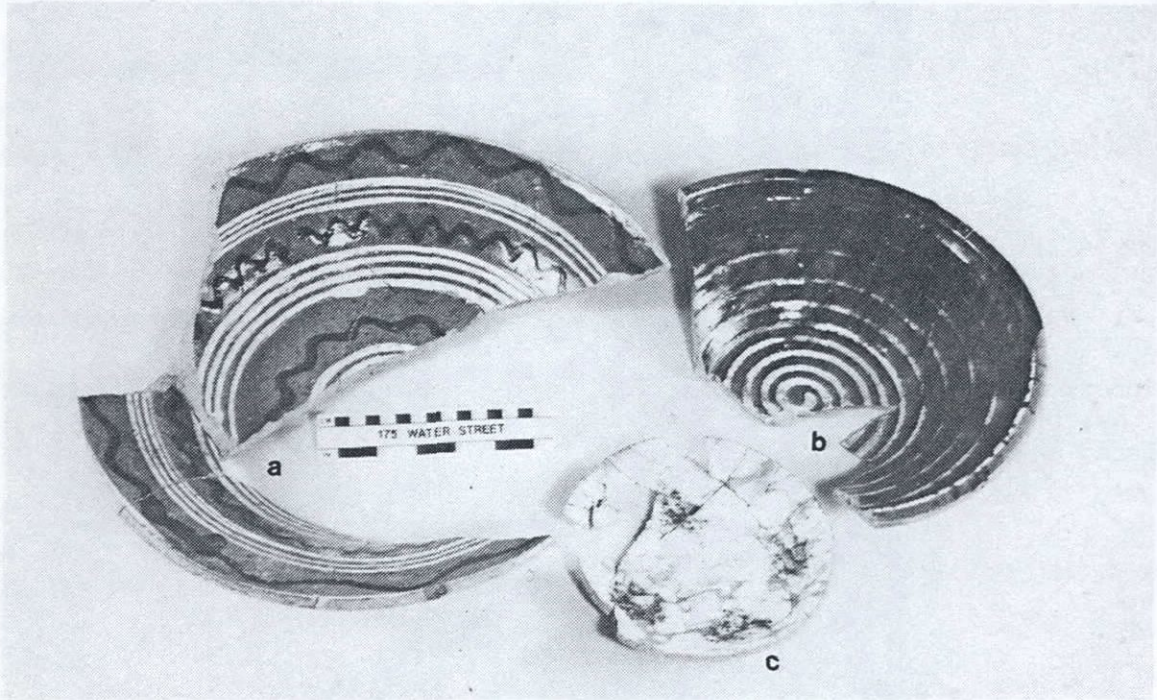


Plate 4.14: Non-feature mends: red bodied slipware, tri-color decoration with copper splashes a) Lot 33, deep bowl b) Lot 32, smaller bowl c) Lot 23, small plate.

Plate 4.15:
Feature 51: creamware mends a) overglaze enameled low bowl b) 10 inch diameter feather edge plate c) overglaze enameled pitcher d) 6 inch diameter plain bowl e) 10 inch octagonal plate.

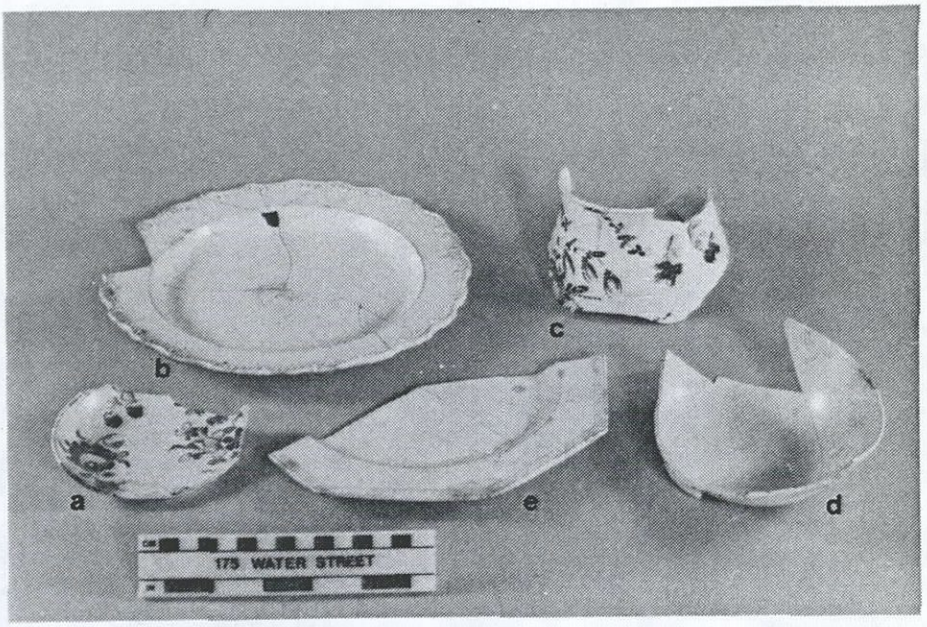


Plate 4.16:
Feature 41: creamware plates, plain rims.

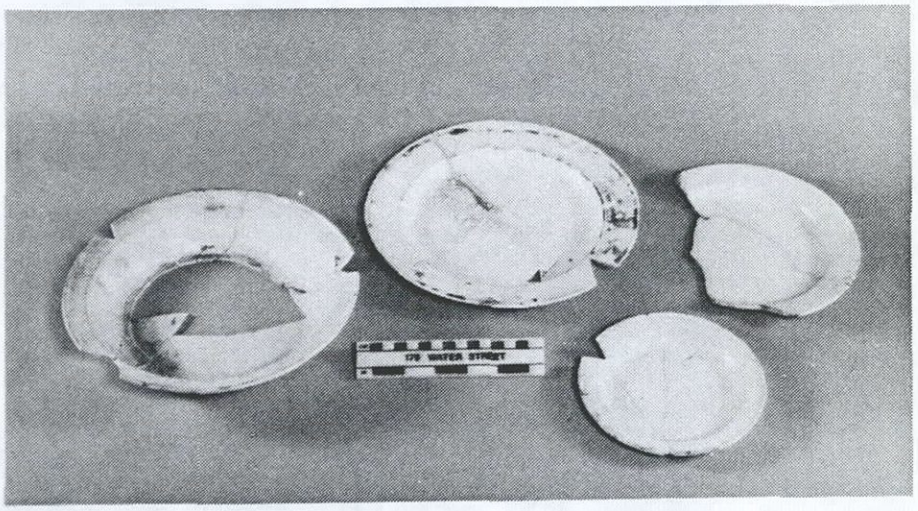


Plate 4.17:
Feature 36: creamware crossmends a) oval bowl b) basin c) fluted oval bowl.



Plate 4.18:
Feature 50: creamware crossmends a) salt cellar b) chamber pot c) 6 inch diameter bowl d) 10 inch royal rim pattern plate.



Plate 4.19:
Feature 41: creamware cups and lids a) molded dessert cup b) plain cup, no handle c) molded dessert cup d) plain cup with handle.



Plate 4:20:
Feature 41: creamware bowls. Front center is polychrome overglaze enameled.

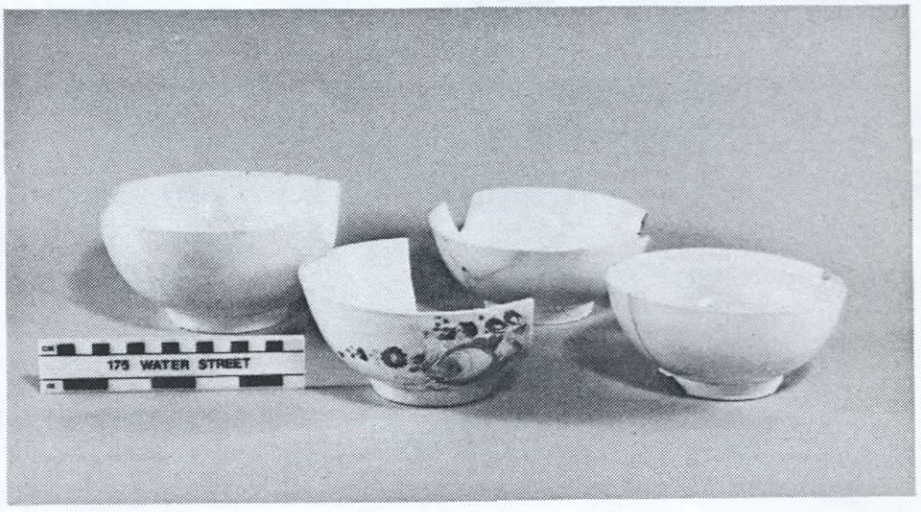




Plate 4.21: Feature 43: creamware crossmends a-d) plain bowls e) pitcher f) tankard g) soup plate h) 10 inch diameter royal rim pattern plate.

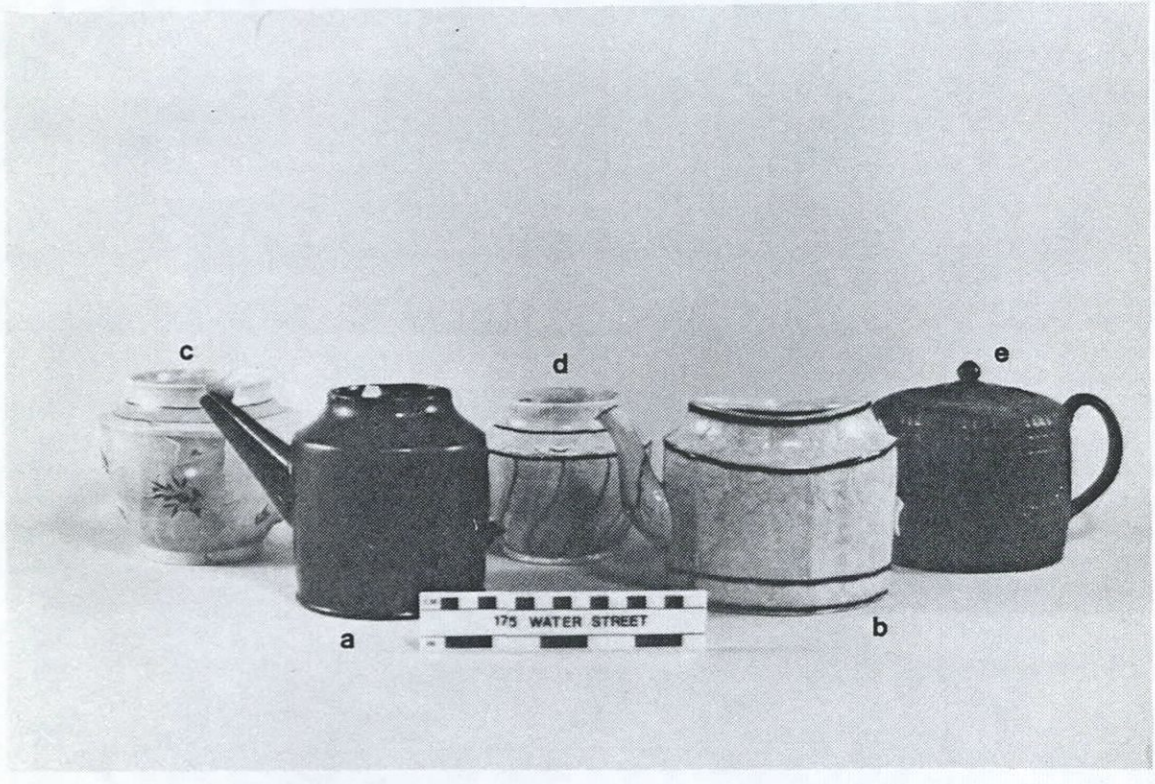


Plate 4.22: Feature 41: teapots a) Jackfield ware b) blue painted embossed pearlware c) polychrome painted fluted pearlware d) polychrome painted pearlware e) engine turned redware.

Plate 4.23:
Feature 30: cross-mends a) brown transfer printed creamware pitcher marked "The Farmer's Arm" "In God is Our Trust" "T Clarke, sculp." b) large brown stoneware jug, incised floral motif c) annular decoration engine turned pearlware pitcher.



Plate 4.24:
Feature 57: mends a) polychrome finger-painted annular pearlware cup, no handle b) matching handled mug c) royal rim pattern creamware plate d) floral motif molded creamware teapot e) creamware teapot lid.

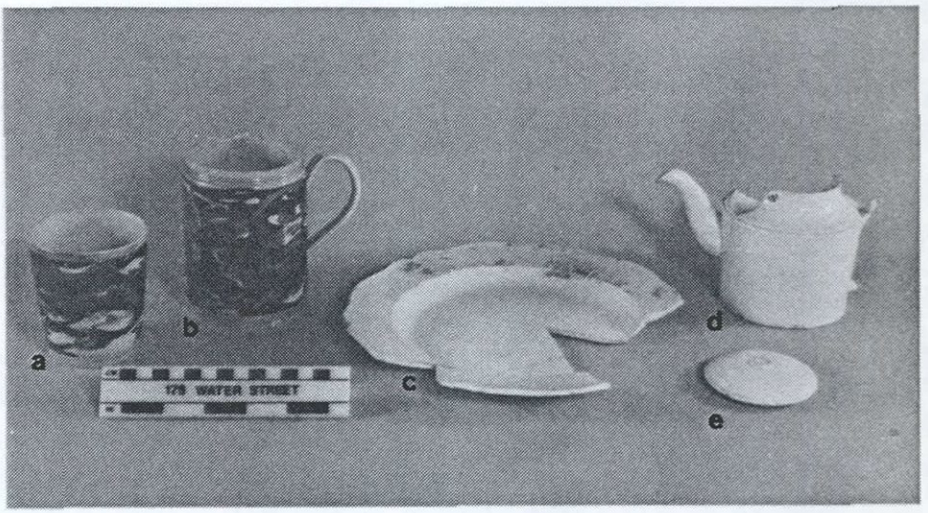


Plate 4.25:
Feature 36: a) agate-like pearlware pitcher b) creamware mug.

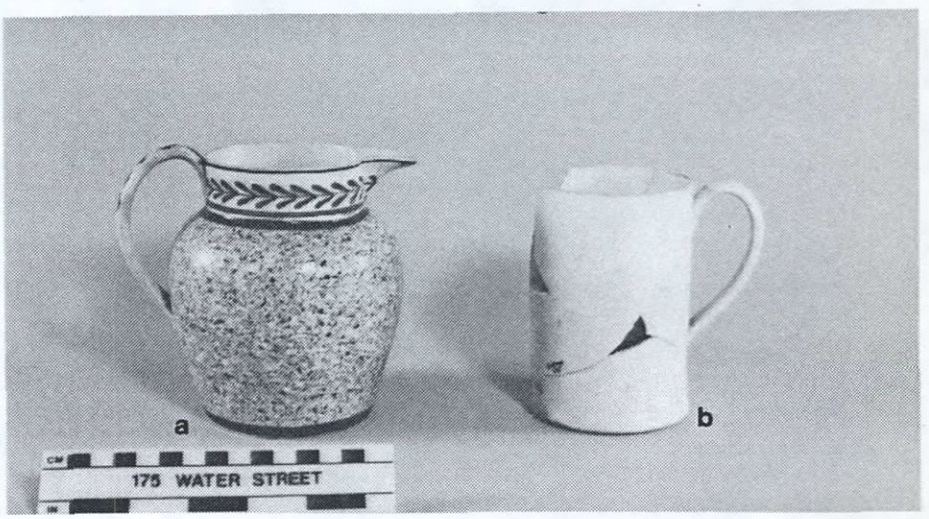




Plate 4.26: Feature 41: tea bowls a-c) creamware d) white salt glazed stoneware; others, various painted patterns on pearlware.



Plate 4.27: Feature 41: low bowls a) white salt glazed stoneware b-d) underglaze polychrome painted pearlware e) blue transfer printed pearlware f-g) underglaze blue painted pearlware.



Plate 4.28: Feature 41: 6 inch diameter underglaze polychrome painted pearlware bowls, floral motifs.

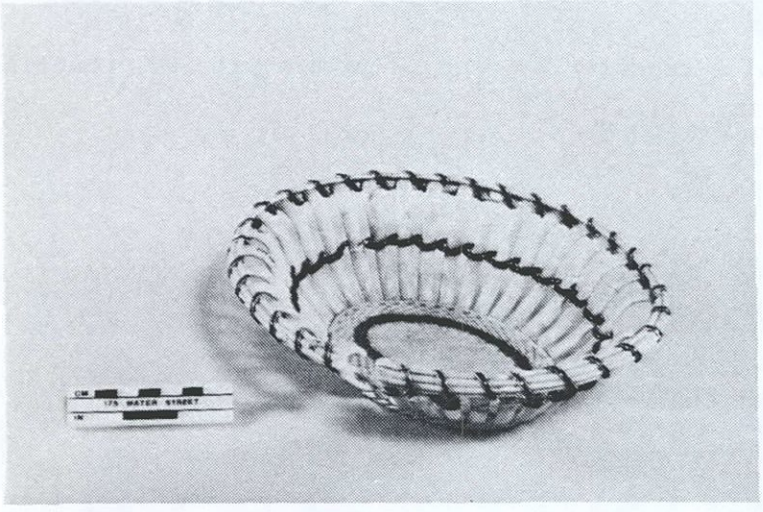


Plate 4.29: Feature 41: molded pearlware open work oval basket, blue painted.

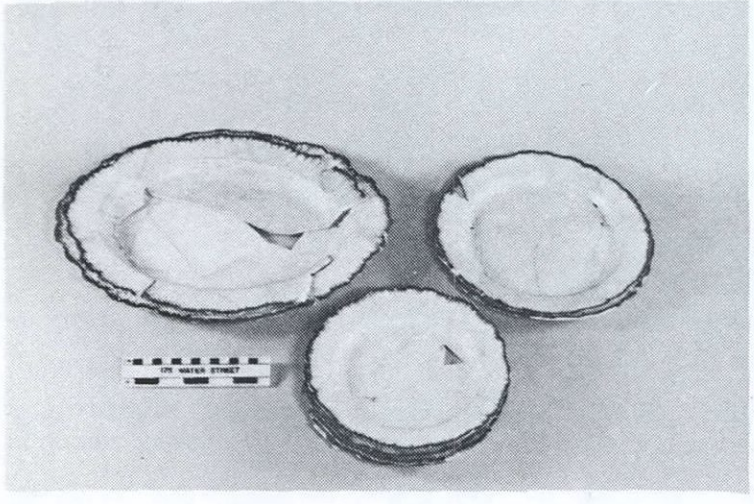


Plate 4.30: Feature 41: blue shell edge pearlware plates.



Plate 4.31: Feature 36: blue transfer printed pearlware pitcher, chinoiserie landscape motif.



Plate 4.32: Feature 43 mends: a) plain pearlware pitcher b) tansfer printed creamware low bowl c) painted creamware low bowl. Others various painted pearlware vessels.

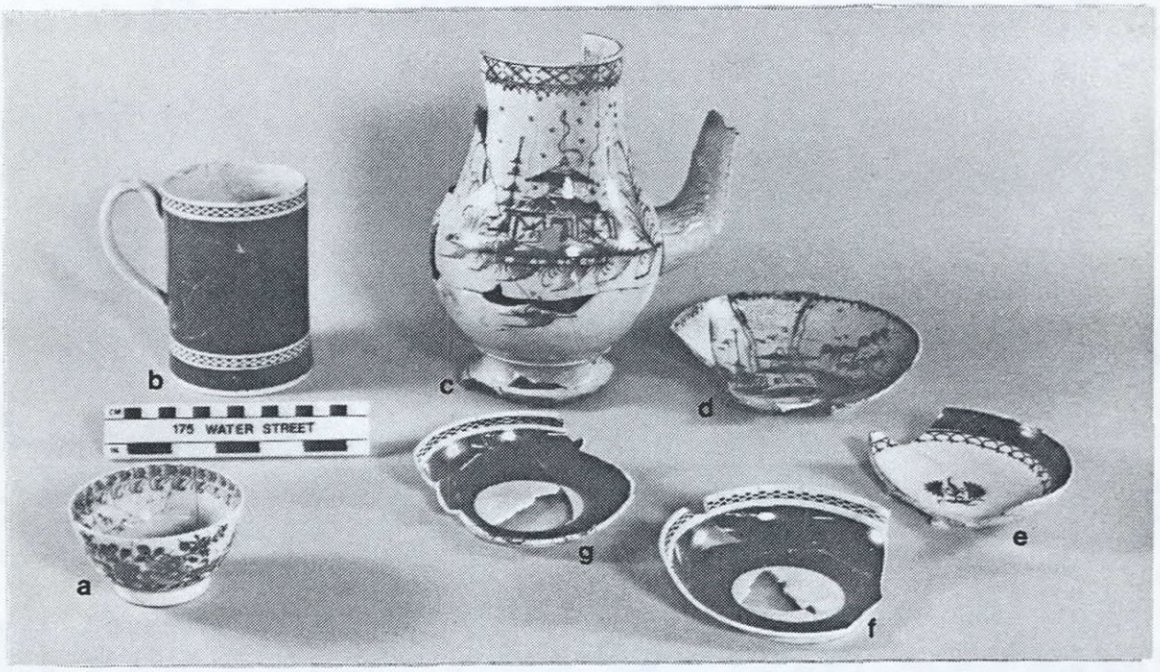


Plate 4.33: Feature 49: mends a) underglaze blue painted fluted porcelain tea bowl b) checkered annular pearlware tankard c-e) underglaze blue painted pearlware pitcher and bowls f-g) engine turned annular pearlware low bowls.

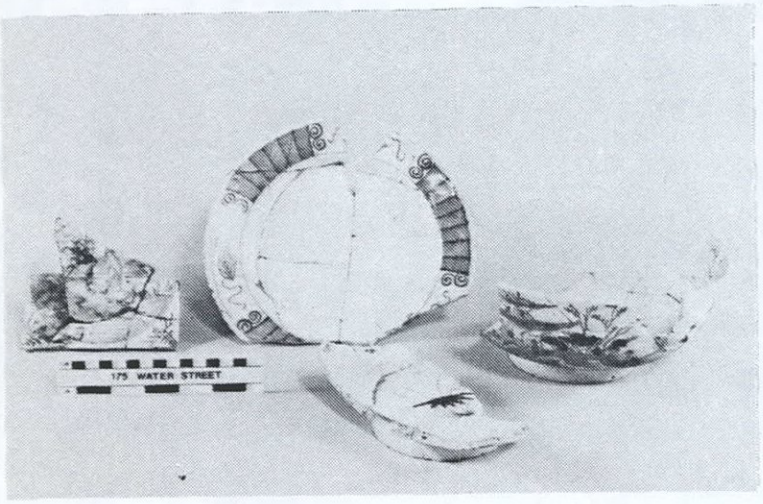


Plate 4.34: Feature 34: delftware crossmends.

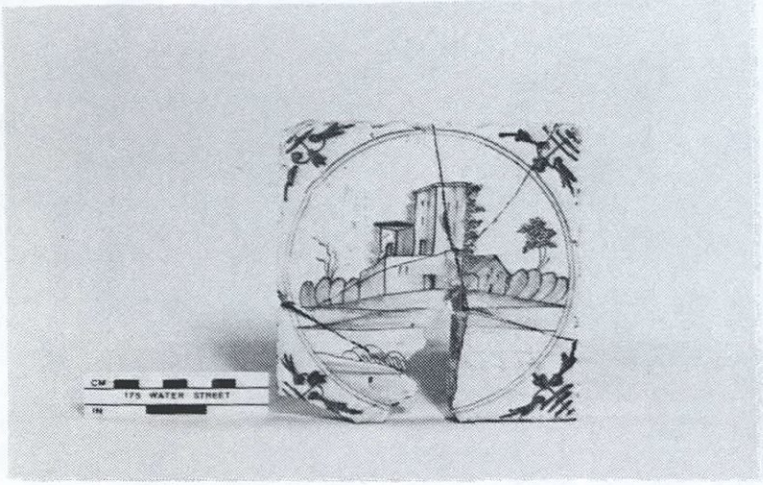


Plate 4.35: non-feature crossmends, Lot 23: delft tile, corner motif, 1700-1750, manganese purple decoration.

Plate 4.36:
Feature 36: chamber pots, red earthenware and creamware.



Plate 4.37:
Feature 34: Westerwald stoneware chamber pot, cobalt blue decoration with alternating sprigged lions and stamped rosettes, 1700-1779.



Plate 4.38:
Feature 41: gray salt glazed stoneware chamber pots, cobalt blue floral motifs.



Plate 4.39:
Feature 41: black basaltes stoneware, 1750-1820 a) bowl with neoclassical motif on exterior, glazed interior b) unglazed lid with molded swan finial.

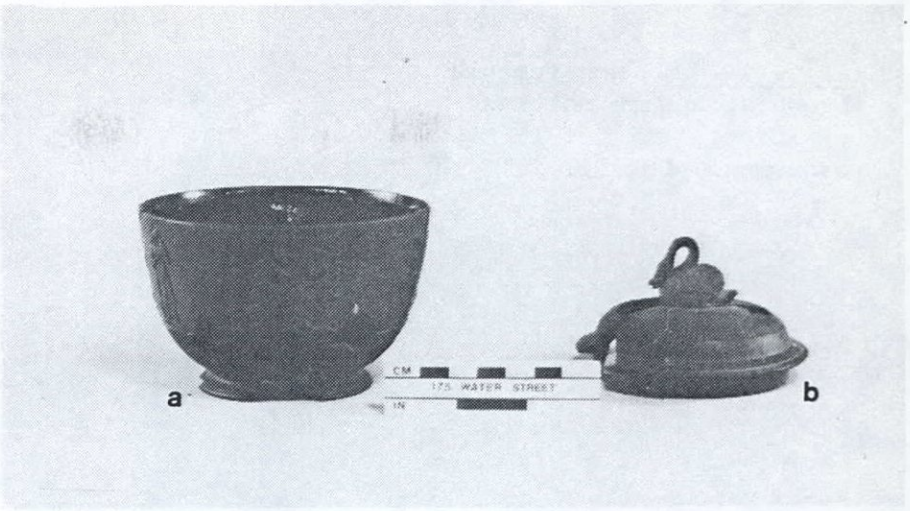


Plate 4.40:
Feature 3 mends a) red bodied trailed slipware serving dish b) brown salt glazed stoneware jug c) Buckley stoneware jug, 1720-1779 d) gray salt glazed stoneware chamber pot.

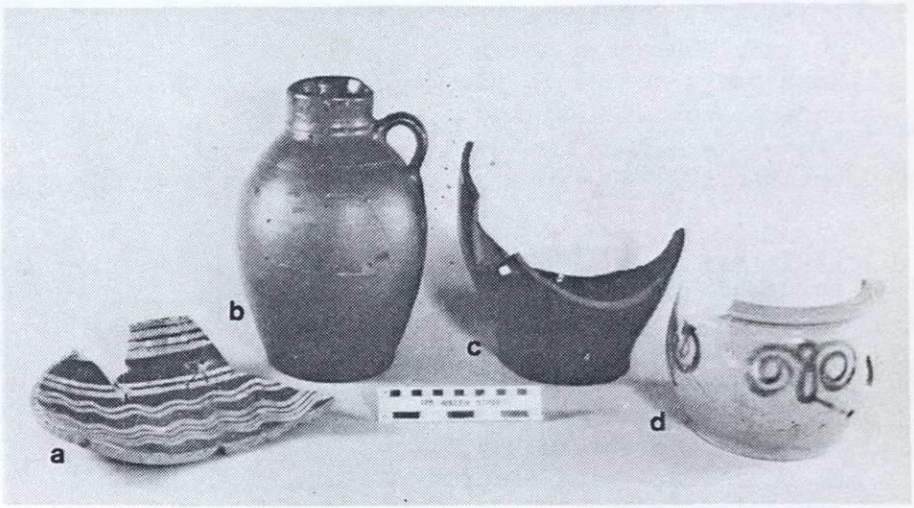


Plate 4.41:
Feature 31 mends a) dotted and trailed buff bodied slipware chamber pot b) white salt-glazed stoneware tea bowl c) Nottingham stoneware pitcher, 1700-1810 d) white salt glazed stoneware chamber pot e) scratch blue white salt glazed stoneware low bowl, 1744-1779.



Plate 4.42: Non-feature brown stoneware bottles a) intact from Lot 19 b) crossmend, Lot 33.



Plate 4.43: Feature 1: 10 inch diameter Canton hard paste porcelain plate, underglaze blue painted "rain and clouds" border motif, 1800-1830.



Plate 4.44: Feature 57 porcelain mends a) overglaze red enameled tea bowl b) 6 inch diameter underglaze blue painted bowl c) underglaze blue painted tea bowl, brown line on rim d) underglaze blue painted handleless cup.

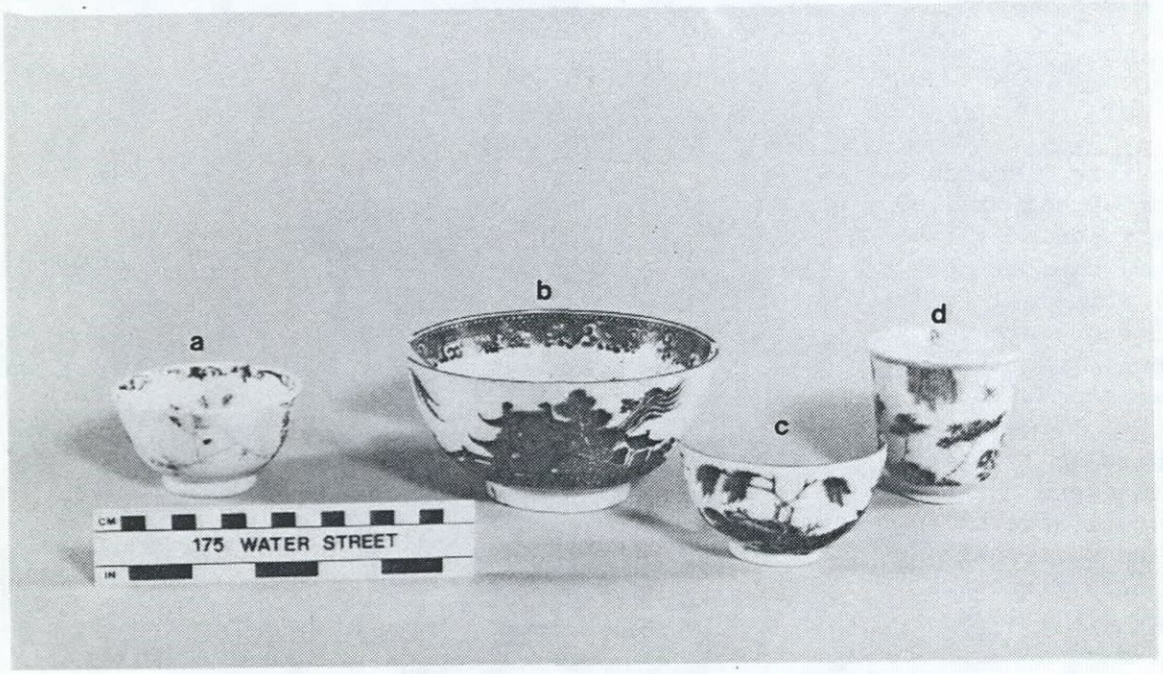




Plate 4.45: Feature 50 porcelain mends a) 4 $^{3}/_{4}$ inch diameter underglaze blue painted bowl b) 5$^{1}/_{2}$ inch diameter overglaze enameled bowl c) 5$^{1}/_{2}$ inch diameter underglaze blue painted bowl d) 5$^{1}/_{2}$ inch diameter underglaze blue painted low bowl.



Plate 4.46: Non-feature crossmend, Lot 33: underglaze blue painted porcelain plate with floral decoration.

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FEATURE DATING AND FUNCTION BASED ON COMBINED GLASS AND CERAMIC DATA

This section presents a summary of chronological and functional information compiled from fifty-seven features from the 175 Water Street site. It is information based mainly on glass and ceramic data; occasionally, however, additional information such as a date from a coin or data from lot histories, was used to make an assessment. A listing of the dating for each feature level will be found in Glass and Ceramic Table 4.17.

Feature Function and Dates
(Joseph Diamond and Nancy A. Stehling)

Feature 1

The cistern in Lot 36 is a primary commercial deposit within a redeposited fill matrix. The dating of level 1.1 is based on a "Churchhill's Specific Remedy for Consumption, Hypophosphites of Lime and Soda, J. Winchester, N.Y." J. Winchester appears in the New York City directories from 1864 to 1896 as a patent medicine proprietor. This date range appears applicable to the bottles in the deposit, particularly since many display manufacturing techniques dating from the mid-nineteenth century or later, such as snap case, blowpipe, or white bare iron pontil scars. The latter technique indicates a time range of 1870-1880 (Munsey 1790:48). The occurrence of ceramic whiteware in this deposit extends the range to 1900; therefore, this portion of the feature has been dated as 1864-1900. The mean ceramic date generated by the computer is 1821. This early date reflects the presence of redeposited eighteenth-century ceramics.

The dating of level 1.2 is based on the occurrence of transfer-printed whiteware, post-1830 to approximately 1864, the date of the level above. The mean ceramic date of 1765, in addition to the mean bottle date of 1700, reflects a transitional zone between the deposit above and the original landfill below. This is corroborated by Midlands earthenware (1660-1750) and "onion" bottle fragments (1680-1720).

The dating of level 1.9 as pre-1760 is based on the total lack of creamware in the deposit which suggests this level is original landfill.

Feature 2

The privy in Lot 33 is a primary commercial deposit within redeposited material. The dating for level 2.1 is based on a snap case bottle (post-1857) and an 1865 Indian head penny from catalog #345. In conjunction with a fragment of safety glass (post-1891), it seems that this section of the feature dates from 1865 to 1900 or thereabouts.

The dating for level 2.2 is based on a bottle embossed "P. Gordon 55 Vessey St., N.Y.". Phillip Gordon is listed in the 1841-1842 New York City directories as a furrier. In 1842, he joined his father, Leonard, in the syrup and cordial manufacturing business, and continued in the business until his death in 1863. His wife, Letitia, the executrix of his will, continued in the business until 1865. We can assume that she would continue to use her

husband's bottles, hence an end date of 1865 seems likely. A date range of 1842-1865 for this level seems probable, an assumption corroborated by the 1865 penny found in the level above. Based on the ceramic mean, the dating for 2.9, the original landfill, is 1762 CTPQ. There was no datable glass.

Feature 3

This wooden cistern in 33.01 is redeposited material. Dating for 3.1 and 3.2 is based on the latest ceramic, undecorated pearlware (1780-1820), and the total lack of snap case bottles (pre-1857). Therefore, a date of 1780-1857 appears likely.

Feature 4

This square stone cistern in 33.09 is an undetermined primary deposit within a redeposited fill matrix. Dating for 4.1 is based on several fragments of a wine bottle manufactured in a three-piece mold with dip mold-body; this postdates 1821. Considered with several sand-pontiled bases, this may extend the range of the deposit to at least 1850, a date which fits well with brown stoneware bottle fragments from the feature that postdates 1820. However, a stopper from what appears to be a hair oil bottle was collected and thrown into a "B" bag, or unsampled artifact bag. This stopper is embossed "Hickox's Pat. April 20, 1869". It appears, then, that a better date for 4.1 is about or post-1869.

Dating for 4.2 can be reserved until the whole feature is looked at.

Dating for 4.3 is based on a brown stoneware whiskey jug from a "B" bag (cat. #657). (Since only 25 percent of this feature was screened and analyzed, we lack definitive datable artifacts; in this case and in the case of Hickox's above, non-sampled materials were utilized to interpret and date these deposits. The brown stoneware flask is impressed "J. Bourne, Patentee, Warranted Not to Absorb, Denby and Codnor-Par Potteries, Derbyshire, Vitreous Stone Bottles." Godden (1971:168-70, 1964:89-90) dates this bottle from 1833-1861; therefore, we feel that this is a reliable date for 4.3.

The dating for the whole feature then, is 1833 to circa or post-1869, based on the stoneware bottle and Hickox's patent respectively.

Feature 5

This builders' trench in 33.02 is a deposit of engineering fill that could not be accurately dated.

Feature 6

This builders' trench in 33.02 is a deposit of engineering fill that dates 1800-1830 or later based on the presence of Canton/Nanking porcelain sherds.

Feature 7

This barrel in 33.06 is redeposited fill which postdates 1795 based on several fragments of pearlware.

Feature 8

This wooden floor in 33.06 is redeposited fill which postdates 1857, based on a snapcase-based bottle. In addition, a blowpipe pontil scarred medicine bottle was found. This would date the feature to approxiamtely 1857-1865.

Feature 9

The soil below the wooden floor in 33.06 is redeposited fill. Based on the date for the floor above, which was 1857-1865, the soil below the floor is pre-1857. However, based on the presence of brown stoneware bottles (1820-1900), a reliable date is 1820-1857.

Feature 10

This brick platform in 33.06 is undatable since there were no ceramics and glass.

Feature 11

This wooden floor in 33.05 is undatable since there were no ceramics and glass.

Feature 12

This wooden floor in 33.05 is undatable since there were no ceramics and glass.

Feature 13

This metal associated with the floor in 33.05 is undatable since there were no ceramics or glass.

Feature 14

The builders' trench in 33.05 is engineering fill with a date of post 1760 based on one fragement of creamware.

Feature 15

The builders' trench in 33.01 is engineering fill and postdates 1785 based on three fragments of transfer-printed pearlware.

Feature 16

The brick floor in 33.01 is undatable.

Feature 17, 18, 26

The L-shaped wall in 33.01, 33.02, 33.04 is post-1790 engineering fill, based on a wine bottle from this period and annular pearlware dated from 1790 to 1820.

Feature 19

The brick platform/floor in 33.03 is most likely post-1780, based on the presence of pearlware.

Feature 20

The brick flower box in 33.03 is redeposited fill and post-dates 1795, based on transfer-printed pearlware.

Feature 21

The builders' trench associated with the flower box in 33.03, is engineering fill and the best possible date is that of the flower box from Feature 20 which is post-1795.

Feature 22

The builders' trench in 33.03 is engineering fill and postdates 1795 based on transfer-printed pearlware.

Feature 23

The stone stoop in 33.04 is engineering fill and postdates 1795, based on transfer-printed and polychrome-decorated pearlware.

Feature 24

The builders' trench in 33.04 is engineering fill and dates post-1795, based on fragments of annular pearlware.

Feature 25

The builders' trench in 33.04 is engineering fill and postdates 1820, based on fragments of brown stoneware bottles, and pre-dates 1857, based on a lack of snap case bottles. Therefore, it is reasonable to assume a date of 1820-1857.

Feature 27

The grey living floor in 33.01, 33.02, 33.03, 33.04 dated from 1790 to 1857 is sheet refuse mixed with redeposited material. The post-1790 date for this feature is based on annular pearlware fragments, and the pre-1858 date is based on a lack of snap case bottles.

Feature 28

The orange living floor 33.01, 33.02, 33.03, 33.04, and 33.09 is sheet refuse mixed with redeposited material. Dating for this "feature" is post-1780, based on edge- decorated pearlware (1780-1820), to about 1790 based on the fact that Feature 27, the grey living floor, overlies this deposit.

Feature 29

The builders' trench in 33.09 is engineering fill and postdates 1795 based on one fragment of polychrome pearlware (1795-1815).

Feature 30

This box in 32.2, because of ceramic wear patterns, appears at first to be a primary domestic deposit, but may be a commercial deposit reflecting a liquor-related activity (see text, Glass section). In 30.1, the latest glass artifacts were several fragments of blown-threemold glass (1913-1840), and the latest ceramics were brown stoneware bottles (1820-1900). Since the fill overlying this box dates from approximately 1823-1850, it is possible that these fragments were intrusive, especially since the artifacts in the box seem to be of a late-eighteenth century or early-nineteenth-century date. With this in mind, it appears that a reliable date for 30.1 and 30.2 is probably 1790 to 1813; in this case, then, the mean ceramic and glass dates are 1794 and 1795 respectively, and are relatively consistent. The feature is dated 1795-1820 based on transfer-printed and underglaze polychrome pearlware and no bottle finishes that show evidence of a standardized lipping tool. The date for 30.3 is somewhat sketchy since a mean ceramic date of 1757 implies an interface or transition into original landfill. The mean ceramic date of 30.4 is 1762, the mean glass date is 1751, but a glass TPQ of 1790 makes classification of original landfill dubious.

Feature 31

This barrel in 30.1 is domestic refuse in redeposited fill. Based on fragments of a vertically-ribbed pocket flask, dating for this feature is post-1790.

Feature 32

The stone privy in 23.05 is a primary commercial deposit within a redeposited fill matrix. The fill matrix seems to date from 1795-1820, but the mean ceramic date is 1766. However, there are some "male-related" artifacts that are probably of a commercial nature that date from 1840-1880. These include a snuff bottle, several wine/liquor bottles, a drinking glass, and a wine bottle from the Dyottville Glassworks in Philadelphia dating from 1860-1880. This latter artifact provides a date for the filling of the feature. In addition, it is probable that the fill matrix was taken from the "pit" (Feature 34) in this lot since a number of ceramic fragments and nailsea glass crossmend between the two features.

Feature 33

This unidentified stone feature in 23.04 is redeposited material that postdates 1790 based on fragments of vertically-ribbed pocket flasks.

Feature 34

This "pit" in 23.04 is a primary commercial deposit. Fragments of mocha-decorated pearlware, underglaze polychrome pearlware, and a quantity of vertically-ribbed pocket flask fragments are dated post-1795. Although this feature also provided a large assemblage of mid-eighteenth-century slipware, these later artifacts appear to date it from 1795 to approximately 1830.

Feature 35

This large box in the southeast corner of 23.04 is redeposited material. Both 35.1 and 35.2 are associated with the box in this unit and not the original landfill. Based on fragments of underglaze polychrome pearlware and transfer-printed pearlware, this deposit probably postdates 1795.

Feature 36

This small box in the southwest corner of 23.04 produced a primary commercial glass deposit and when combined with ceramic data, a possible combination of primary domestic and commercial components. Although the mean ceramic date for the feature was 1796 and the mean bottle date was 1799, because much of the glass and ceramic material appear related to a known china and glass store, it was felt that an approximate date of 1809 for the feature's commercial glass and ceramic components is more plausible. The glass MNV count indicates that 87.8% of the glass from the feature is table glass of which 72.4% had no wear and 21.0% showed slight wear that may be related to shelf wear. Of 87 non-leaded vessels (tumblers), 98.9% had slight or no wear and may represent unused merchandise. The high percentage of table glass and the portion of the ceramics with no wear point to commercial activity perhaps related to Garret Kettletas' china and glass store of 1809 on this lot. It should be noted that a domestic component, based on that portion of the ceramic assemblage with heavy wear may have predated or been contemporary with Kettletas' store.

Feature 37

This barrel in 23.03 is a primary commercial deposit mixed with redeposited material. This feature can be dated post-1795 based on fragments of underglaze blue-painted pearlware; however, the nature of the deposit suggests a more conclusive date. Of five table glass MNV, four showed no wear and one had slight wear. In addition, excavation revealed a level of black, oily, organic material. This organic matter is probably straw, since straw was the primary packaging material for glass in barrels in the seventeenth, eighteenth, and nineteenth centuries. Also, straw absorbs oil, and in this case, probably would have absorbed organic oils from the landfill and a fluctuating water table. It is probable, then, that this feature, like Feature 36, represents a deposit associated with Garret Kettletas' china and glass store of 1809.

Feature 38

This cistern in 23.04 is redeposited material. A date of 1795 to 1830 is based on fragments of transfer-printed pearlware (1795-1830) and fragments of vertically-ribbed pocket flasks (1790-1830).

Feature 39

This wall trench in 23.04 is engineering fill. Dating is post-1795, based on a fragment of transfer-printed pearlware.

Feature 40

This unidentified feature in 23.04 is redeposited fill. Dating for 40.1 is post-1795 to about 1830 based on fragments of transfer-printed pearlware. Dating for 40.2 and 40.3 is approximately 1790 based on fragments of vertically-ribbed pocket flask fragments. Level 40.9 is probably landfill although nothing datable was found.

Feature 41

This privy in 22.02 is a primary commercial deposit. Although the mean ceramic and mean glass dates for 41.1 are 1794 and 1800 respectively, the analysts feel that this deposit may be associated with one of several possible occupations. These are: 1) the china store of Hawxhurst and Mowatt (1789-1796), 2) the "looking glass" store of Dunlap and Judah (1799), 3) the glass and china store of William N. Kettletas (1800-1808) or 4) the china store of James Burling (1816-1826). Because of the manufacturing range of the ceramics (see ceramics section) and glass of this period, it is not possible to define a specific occupation. It does seem likely, however, that these deposits are best associated with the Kettletas occupation (1800-1808).

Feature 41.2 is a transition from 41.1 to original landfill, with a 1795 CTPQ and GTPQ.

Feature 41.9 is original landfill and, based on a lack of pearlware, probably predates 1780.

Feature 42

This small privy in 21.01 is redeposited material. Dating for 42.1 is based on three-piece mold with dip mold body wine bottle fragments and a medicine bottle from 42.2. The date for this section, is 1857-1865.

Dating for 42.2 appears to be 1857-1865, based on a twelve-sided medicine bottle with a snap case base. This deposit appears to be a late-eighteenth century or early-nineteenth-century fill matrix mixed with mid-nineteenth-century artifacts. From the quantity of olive oils found in this privy, it is obvious that this feature was open or in the process of being filled after, or during, the period of lot filling in Lot 32. A stone lintel, bridging the gap over the small privy, made it possible for artifacts to migrate under the stone wall from Lot 32 into Lot 21.

Dating for 42.9, the original landfill, is probably mid-eighteenth century. The mean bottle date is 1764 and mean ceramic date is 1743.

Feature 43

This large privy in 21.01 is composed of various elements. 43.1 is redeposited fill. Dating for this level is post-1820 based on fragments of a brown stoneware bottle. Fragments of blown three-mold glass (1813-1840) seem to corroborate this range. A terminal date for this level is approximately 1865 since, in many respects, particularly glass crossmends, this level resembles 42.2. There were no ceramic mends. 43.2 is a primary domestic deposit with numerous ceramic mends and crossmends of various vessel forms. The dating for this level is most likely 1795-1820 as it contains transfer-printed pearlware (1795) and predates the deposit above which dates from 1820. 43.3 is redeposited fill representing probable interface to the original landfill below as there are crossmends with Cat. #8170 (Feature 43.3) which dates to the late-eighteenth century. 43.9 is most likely a top level of original landfill; three fragments of undecorated creamware provided a CTPQ of 1762.

Feature 44

This round privy in 21.02 is redeposited material. Dating for 44.1 comes from a 1786 date on a Vermont copper coin. Since there are no snap case bottles, the level seems to predate 1857. 44.9 is original landfill and predates 1786 based on the coin from the level above.

Feature 45

The "drain" in 21.02 is a drain-like feature dating from the mid-nineteenth century to 1960, the latter date based on several Budweiser cans in the deposit and the known date for the blacktopping of the lot.

Feature 46

This drain-like feature in 21.01 is a redeposited fill mixed with material from 43.2. Dating for this deposit is probably 1820 to 1865 based on brown stoneware bottle fragments and the possibility that this feature was built as the larger privy was being filled in.

Feature 47

This privy in 20.05 is a primary domestic deposit within redeposited material. Based on the occurrence of pontiled and snap case bottles, in addition to an American nickel (1867-83), it is likely that this deposit dates from 1867. Added weight is given to this date by a crystal wine glass (Cat. #5287.7) which appears in the 1859/60 McKee and Brothers Catalogue, and two "C. H. Ring New York" bottles. C. H. Ring is listed in the New York directories from 1845-1860 as a druggist; however, from 1861-1865 he is listed as a medicine and patent medicine distributor. It is probable that these bottles date to this period, particularly since they are almost identical except that one is pontiled and the other has a snap case base. The ceramics reflect their redeposited fill matrix, with a mean ceramic date of 1762.

Feature 48

This privy in 20.02 is redeposited material. 48.1 and 48.2 are dated between 1799-1830 based on a 1799 five dollar gold piece (Cat. #5348) and a vertically ribbed tumbler dating from 1890-1830. Feature 48.9, probably original landfill, has a mean ceramic date of 1734.

Feature 49

This box in 20.05 and 20.06 is a primary domestic deposit, probably of one episode. This deposit dates from 1795-1820 based on a 1785-1788 Connecticut Copper Coin(Cat. #5333), large amounts of pearlware (post-1795), creamware, and vertically ribbed and swirled bottles, in addition to many plain drawn-stem wine glasses. A terminal date of 1820 is based on no bottle finishes with evidence of a standarized lipping tool.

Feature 50

This privy in 19.03 is a primary domestic deposit within an older redeposited fill. Feature 50.1 dates from 1780-1830 based on undecorated pearlware. Feature 50.9 is probably original landfill. Level 50.1 has ceramic mends attributable to use; 50.9 has no ceramic mends and no wear information.

Feature 51

This privy in 18.02 is a primary domestic deposit in conjunction with redeposited material. This feature dates from 1790-1820 based on finger painted creamware (1790-1820) and vertically ribbed tumbler fragments. 51.9, probably a level of original landfill below the privy deposit, has a CTPQ of 1720 and no glass date.

Feature 52

This box in 1801 is redeposited material. Dating for this feature is 1780-1830 based on the occurrence of underglaze blue painted and undecorated pearlware. A wine glass with a silesian stem (1715-1730) from Cat. #8208 is obviously a redeposited artifact. One original landfill level, 52.9, is dated 1770 based on GTPQ.

Feature 53

This unidentified feature in 18.01 is redeposited material mixed with perhaps one primary artifact. From the glass data, this feature dates from 1860-1890 based on a "Stickwell and Co." inkwell from Cat. #8218. A possible fragment of whiteware seems to corroborate this, however, the sample size is too small to be conclusive.

Feature 54

This cistern base in 18.04 is redeposited material. Dating for 54.1 is post-1795 based on transfer-printed and underglaze polychrome pearlware. Feature 54.2 is possibly original landfill with a mean ceramic date of 1740 and a GTPQ of 1759. Like Feature 53, the sample size is too small to be conclusive.

Feature 55

This deeptest in Lot 29/30 is original landfill. 55.1 dates from 1763 or later, based on three "R. Curson 1763" glass wine bottle seals. Shell edged creamware (1780-1820) brings the date post-1780. Feature 55.2 dates from 1763 based on four "R. Curson 1763" wine bottle seals. Features 55.3 and 55.4 date from approximately 1750.

Feature 56

This deeptest in Lot 29/30 is original landfill dated pre-1780, based on a lack of pearlware. The latest ceramic present, creamware, which comes from Level 1, dates from 1759-1779.

Feature 57

This barrel, east and somewhat below the privy in 33.05 and 33.07, is a primary domestic feature dating from 1790 to 1830 based on finger painted pearlware and Canton porcelain (1800-1830) ceramic sherds. A section of this feature is probably a late level of original landfill (F57.9) with a ceramic TPQ of 1762 and a glass TPQ of 1770.

Glass and Ceramic Table 4.1 175 WATER STREET: Feature Dating

Lot Number	Feature Description	Feature Number	Feature Level	Deposit Date Range	Comments
36	cistern	1	1	1864-1900	
			2	1830-1864	
			9	pre-1760	original landfill
33	privy	2	1	1865-1900	
			2	1842-1865	
			9	1762	original landfill
	barrel-cistern	3	1,2	1780-1857	
			9	1780	original landfill
	stone cistern	4	1,2,3	1833-1869	
	builders' trench	5	1	no date	
	builders' trench	6	1	1800-1830	
	barrel	7	1	post 1795	
	wooden floor	8	1	1857-1865	
	soil below F8	9	1	1820-1857	
	brick platform	10	1	no date	
	wooden floor	11	1	no date	
	wooden floor	12	1	no date	
	metal from F12	13	1	no date	
	builders' trench	14	1	post-1760	
	builders' trench	15	1	post-1785	
	brick floor	16	1	no date	
	wall segments	17,18,26	1	1790-1820	
	brick platform	19	1	post-1780	
	"flower box"	20	1	post-1795	
	builders' trench	21	1	post-1795	for F20
	builders' trench	22	1	post-1795	
	stone stoop	23	1	post-1795	
	builders' trench	24	1	post-1795	
	builders' trench	25	1	1820-1857	
	grey deposit	27	1	1790-1857	"living surface"
	orange deposit	28	1	1780-1790	below F27
	builders' trench	29	1	post-1795	
32	box	30	1,2,3,4	1795-1820	
30	barrel	31	1,2	post-1790	
23	privy	32	1,2,3,4	1860-1880	1795-1820 fill matrix
	unid. feature	33	1	post-1790	
	"pit"	34	1,2,3,4,5	1795-1830	
	box	35	1,2	post-1795	large box
	box	36	1,2	post-1795	may relate to 1809 store
	barrel	37	1	post-1795	may relate to 1809 store
	cistern base	38	1,2	1795-1830	
	trench	39	1	post-1795	
	unid. feature	40	1	1795-1830	
			2,3	1790	
			9	no date	original landfill?
22	privy	41	1	1800-1808	(other possible dates: 1789-96;1799;1816-26)
			2	post-1795	
			9	pre-1780	original landfill
21	privy	42	1,2	1857-1865	late 18th-early 19th c. fill matrix in level 2

Glass and Ceramic Table 4.1 (continued)

Lot Number	Feature Description	Feature Number	Feature Level	Deposit Date Range	Comments
21	privy (continued)	42	9	post-1770	original landfill
	privy	43	1	1820-1865	redeposited fill
			2	1795-1820	domestic component
			3	pre-1795	interface to landfill
			9	post-1762	original landfill
	privy	44	1	1786-1857	1786 is a coin date
			9	pre-1786	original landfill
	drain	45	1	1850-1960	
	drain	46	1	1820-1865	
20	privy	47	1,2,3	1867	in a redeposited fill
	privy	48	1,2	1799-1830	
			9	pre-1790	original landfill
	box/cofferdam	49	1,2,3	1795-1820	secondary fill(?)
			9	pre-1795	original landfill
19	privy	50	1	1780-1830	cut into wharf/grillage
			9	pre-1780	wharf/grillage
18	privy	51	1,2	1790-1820	
			9	post-1720	original landfill
	box	52	1,2	1780-1830	
			9	post-1770	original landfill
	unid. feature	53	1,2	1860-1890	
	cistern base	54	1	post-1795	
			2	post-1750	possible original landfill; small deposit
30	deeptest	55	1	post-1780	original landfill
			2	post-1763	original landfill
			3,4	post-1750	original landfill
29	deeptest	56	1	post-1759	original landfill
			2,3,4	post-1744	original landfill
33	barrel	57	1	1790-1830	
			9	post-1770	original landfill

SMALL FINDS
(Debra Bodie)

For the purposes of the 175 Water Street artifact analysis, small finds were defined as all artifacts not specifically reserved to the following analytical catagories: ceramics, glass, pipes, leather, flora, fauna, and architectural materials. As a result, small finds artifacts, which include objects as diverse as large wooden casks and small glass beads, vary greatly in size as well as in material class, mode of manufacture, and functional attributes.

In order to usefully accommodate the diversity of artifacts contained within the small finds catagory, tabulation of these materials was based upon a modified version of the artifact class utilized by South (1977). These modifications were intended to more usefully reflect historical conditions existing on the 175 Water Street block where commercial rather than domestic interests were generally pre-eminent. These functional classes and a brief listing of the artifacts contained within them are presented in Small Finds Table 4.18. In addition to cited sources used for identification during analysis, Gould (1942), Grimm (1970), Montgomery (1973), Randall (1971), Sleen (1943), and Stone (1974) were also consulted.

A total of 4,298 small finds were tabulated, including 64 coins and coin- like objects which were discussed more fully in a separate chapter.[1] As with all other artifactual materials, tabulation of small finds was computerized utilizing the ARDVARK format. Beyond the grouping into functional catagory (e.g., personal item), artifacts were tabulated according to general morphology (e.g., bead). Tabulation further included reference to material class (e.g., colored glass) and to type (e.g., wound or drawn). Type may be regarded as generally congruent with either method of manufacture, function, or some significant stylistic attribute.

It should be noted that the ability to accurately distinguish type, and even material class, varied considerably with the site of preservation of the artifact. Many of these artifacts were made, at least in part, of organic materials such as wood, bone, and various fabrics that tend to decay; they also were composed of various metals, many of which corrode badly in an archaeological context. For this reason, upon completion of the tabulation, many small finds were sent out for conservation involving both chemical and mechanical cleaning and chemical stabilization.

Prior to cleaning and stabilization, it was felt best to judge material class and type conservatively. For example, on the advice of conservators Heidi Mitsch and Betty Seifert, brass and bronze, both copper alloys which are sometimes difficult to distinguish even when thoroughly cleaned and stablized, were classed merely as "copper alloy" for the purpose of the artifact tabulation. It is anticipated that following the conservation of these and other small finds artifacts, a more detailed analysis of attributes will be possible.

[1] The coins and coin-like objects, as well as approximately 800 of the other small finds artifacts, were tabulated by Steven Nicklas, the remainder were tabulated by Debra Bodie.

Ideally, conservation would have preceded tabulation, but conservation was projected to take months for many materials and as long as a year for some, which would not have allowed sufficient time for artifact analysis and report preparation. Utilizing the electrolysis facilities at Drew University, New Jersey, only the coins and coin-like objects were thoroughly cleaned prior to tabulation.

As noted, small finds were tabulated according to the functional catagories utilized by South (1977). A detailed breakdown of these groups listing the number and percentage of the artifacts contained within these groups is presented in Small Finds Tables 4.19-4.25.

The absence of certain classes of artifacts from these tables should not be taken necessarily to indicate the absence of associated acitivities on the 175 Water Street block. For example, information from city directories and tax records indicates the presence of at least three tailor shops on the 175 Water Street block between 1791 and 1850. Yet, while 204 pins and five thimbles were recovered during excavation, no sewing needles were found. The only needle-like object recovered was a large wood needle probably used for net making. The absence of regular sewing needles in this instance undoubtedly reflects the fact that iron and steel sewing needles corrode and are lost faster in an archaeological context than are copper alloy and tin-plated copper alloy pins (c.f., Noel Hume 1976). Differential preservation is therefore an important factor in the interpretation of activities associated with these functional categories.

Rather than discuss each of the small finds artifacts, many of which are present in too few numbers to make valid statements concerning the reason for their presence or distribution on the block, the following discussion will be restricted to a brief review of the functional categories utilized in the tabulation of these artifacts. The relative distribution of functional groups among several of the most significant of the features excavated will also be reviewed.

Of the small finds artifacts recovered from the 175 Water Street block, 67 were classified as belonging to the Arms group (Small Finds Table 4.19). The most numerous of these are the gunflints and gunspalls which number 39. The distinction between gunflints and gunspalls has been taken from Noel Hume (1976) and Stone (1974); gunflints are defined as those gunflints which are made from prismatic blades, and gunspalls are those gunflints which are made from flakes or spalls struck directly from a core. Gunspalls are frequently, although not always, more crudely fashioned and often bear evidence of the chert cortex of the nodule from which they were struck. Eight of the 10 gunflints recovered from the site appear to be French imports made of brown or honey brown chert. This is distinct from the 29 gunspalls recovered, only 5 of which are French imports made of the same brown or honey brown chert. The rest of the gunspalls recovered were made of grey, grey/black, or black chert, all apparently of either English origin or domestically manufactured of local chert. It is also possible that a number of the gunspalls were made locally of chert imported from England as ballast (c.f., Hamilton and Fry 1971).

Contained within the Activities group are 2,926 artifacts that reflect a number of diverse activities. Of these, 1,059 artifacts are considered as a group to be of limited diagnositc value with respect to functional and temporal characteristics. These include 434 metal artifacts (computer code prefix "GM") comprising unidentifiable fragments of machinery and miscellaneous metal scrap fragments, nearly all of which are badly corroded. Also included in this category are 1,625 miscellaneous worked organic artifacts (computer code prefix "GW") and 160 miscellaneous worked inorganic artifacts (computer code prefix "GZ").

Excluding these artifacts, the Activities group contains 867 small finds artifacts. These include pharmaceutical items; manufacturing debris, such as botton blanks and kiln wasters; lead bale seals (see Figure 4.4) hardware; fishing gear; lighting equipment; paper; writing instruments; toys; brushed; and wood casks, as well as other miscellaneous items. A complete listing of these items will be found in Small Finds Table 4.20.

One hundred seventy-nine artifacts are contained with the Kitchen group. These include 85 bottle stoppers of various sizes made of wood or cork and 65 knives, spoons, and cutlery handle fragments, as well as various other miscellaneous kitchen related items (Small Finds Table 4.21). All 3 of the identifiable knives recovered from the site have ferrous metal (iron or steel) blades and tangs. Of the 18 identifiable spoons recovered, only 1 large kitchen spoon was made of ferrous metal; the remainder, which include tablespoons, teaspoons, and baby spoons, were cast in one piece of pewter, copper alloy, or silver (which is possibly silver-plated copper alloy). For the most part, the bone or antler plates of the cutlery recovered from the site survived better than did the metal of the utensil itself. This undoubtedly explains why no identifiable forks were recovered from the site, the thinner metal used to form the tines having rusted away, leaving only the unidentifiable utensil handle.

The Sewing group, as noted previously, is presented at the site principally by 204 pins (Small Finds Table 4.22). Of these, 4 are gold-plated copper alloy pins, 98 are tin-plated copper alloy pins, and 101 are copper alloy (i.e., brass) pins, which may have once also been tin-plated (c.f., Hume 1976). Most of these pins (86%) have spiral wire-wrapped heads, a method of manufacture which was superceded in 1824 with the invention of a machine that stamped out a solid head pin in one step (c.f., Noel Hume 1976).

Contained with the Personal group are 775 small finds artifacts, of which 402, or more than half, are buttons or button fragments (Small Finds Table 4.23). The majority of the buttons recovered are made of bone, wood, shell, or various metals. In tabulating the buttons, an expanded version of South's (1977) button typology was utilized. However, as many of the metal and metal composite buttons were recovered in a badly corroded state, analysis of their method of manufacture can only be accomplished after they have been fully conserved. This is also true of most of the 19 cufflinks recovered.

Other artifacts contained within the Personal group which were recovered in significant numbers include: combs made of lead, bone, horn, or vulcanite; beads made of a great variety of raw materials; buckles, most of them copper alloy (see Figure 4.5); and finally, kaolin wig curlers, most of them lacking maker's marks. A variety of other Personal items such as jewelry fragments, scraps of cloth, and parts of fans, were also recovered. Finally, it should be noted that coins and coin-like objects are also included in the Personal group, but these are discussed more fully elsewhere (see Coin Report, this chapter).

The last of the historic functional categories to be included in the small finds artifact analysis is the Furniture group, consisting of furniture parts and hardware. Of the 127 artifacts included in this group, the most common are upholstery tacks made of copper alloy (i.e., brass) of which there are 63. Among the other furniture-related artifacts recovered (Small Finds Table 4.24) were various pull knobs, bail handles, and key escutcheon plates.

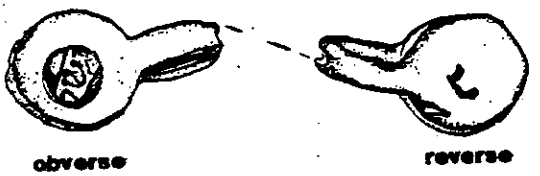
In addition to the six prehistoric functional categories discussed, 11 prehistoric, or more properly, Amer-Indian, artifacts were recovered from the Small Finds site (Small Finds Table 4.25). These include two Late Woodland cord-marked ceramic sherds, miscellaneous debitage, a wood-working scraper, a knife, and a fragment of worked steatite. As the 175 Water Street block was created in the mid-eighteenth century by land-filling in the East River, none of these prehistoric artifacts are the result of primary depositional patterns. Their occurrence on the block can be confidentally attributed to incidental inclusion with fill materials that were used to build up the block's backyard areas and to fill in several disused privies (for example, Features 48 and 51).

Fifty-seven features were excavated at the 175 Water Street block, all but one of which contained at least one small finds artifact, and a number of which contained many more. Since these feature deposits are associated with the actual habitation of the block over time, rather than block-making activities, the following discussion will focus on the small finds recovered from feature deposits. Where appropriate, aspects of the small finds assemblage from original landfill deposits, principally from below the features, will be noted.

Dates for all features containing small finds are summarized in Small Finds Table 4.26. Because, as noted previously, miscellaneous worked metal ("GM"), miscellaneous worked organic materials ("GW"), and miscellaneous worked inorganic materials ("GZ") are considered as a group to be of limited diagnostic value, this table includes two figures for materials in the Activities group: one in which these artifacts are excluded and one in which they are included. It may be seen that for the most part these figures do not differ significantly except in the case of Feature 45, a drain built inside a privy in Lot 21. This feature was found to be filled with recent twentieth-century debris, much of it tabulated as miscellaneous worked metal and also as miscellaneous worked organic materials which included fiberboard and unidentifiable rubber fragments.

Figure 4.4
175 WATER STREET

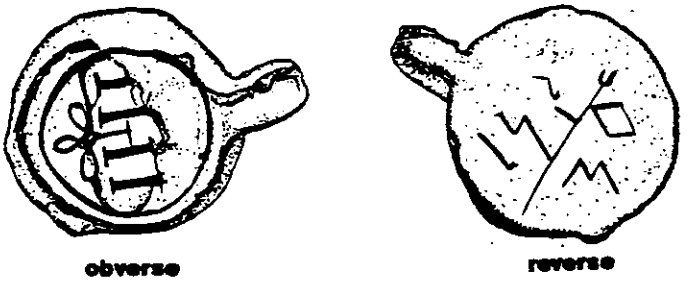
Small Finds
Lead Seals



Cat. #435 519NF



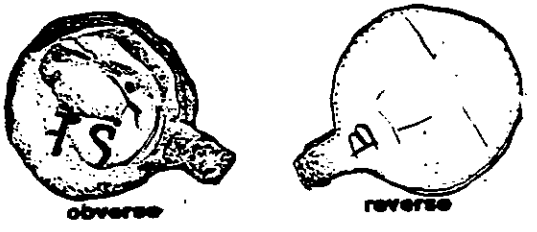
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Cat. #8012 508NF



Cat. #8081 F55.1

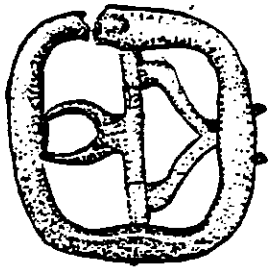


Cat. #5231 502NF

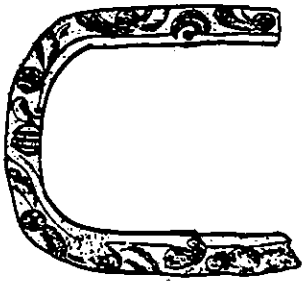


Figure 4.5
175 WATER STREET

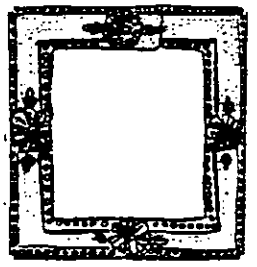
Small Finds
Buckles (obverse only)



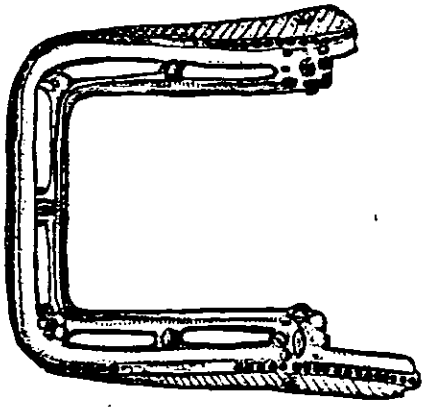
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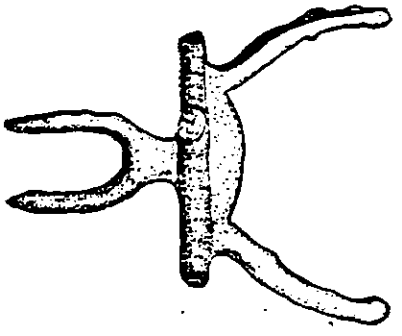
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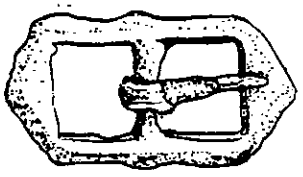
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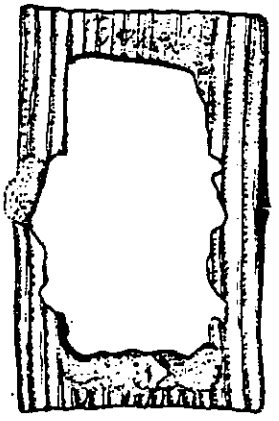
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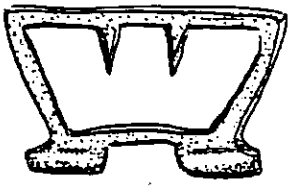
Cat. #12 520NF



Cat. #8099 508NF



Cat. #65 519NF



Cat. #518 F27.1



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Of the fifty features which contained small finds artifacts, thirteen have been singled out because of the information they provide concerning both domestic and commercial utilization of the 175 Water Street block. In addition, Features 55 and 56, both deeptests, provided information concerning the landfilling of the block. These features are discussed in the following paragraphs. It should be noted that since the figures including and excluding all "GM", "GW", and "GZ" artifacts remain roughly similar for most features, references to totals include these materials.

The first of these features is Feature 1, a rectangular cistern located in Lot 36. Glass from this feature suggests that it is a primary commercial deposit dating from the mid- to late-nineteenth century, mixed apparently with ceramics representing redeposited fill. The small finds artifacts recovered from this feature are weighted heavily towards personal items which number 26 out of a total 41 artifacts (Small Finds Table 4.27). Most of the artifacts in the Personal group are buttons. These are primarily of bone, although shell buttons occur in both levels 1 and 2, and one wood button was found in Level 2. The landfill stratum below this feature is distinct in that it contains no artifacts from the Personal group. Instead, small finds artifacts from this stratum consist of 15 pins (Sewing group) and one piece of scrap lead (Activities group).

The next feature of importance is Feature 2, a privy located in Lot 33 (Small Finds Table 4.28). Like Feature 1, data derived from the glass analysis suggest this is a primary deposit of commercial fill (dating to essentially the same period as Feature 1) with the ceramics again suggesting the deposit is mixed with redeposited fill. Level 1 in Feature 2 appears to be characterized by items from the Activities group, but since 6 of the 12 items are actually fragments of the same iron bucket, in fact, items from the Personal group predominate in this level. Level 2 is characterized by items from the Activities groups, including 3 of the 7 glass blunt-point syringes and syringe fragments found on the 175 Water Street block. Items from the Personal and Kitchen groups make up the bulk of the remainder of the small finds from this feature. The landfill below this feature resembles the preceeding levels with items from the Activities and Personal groups predominating; however, unlike the buttons found within features which were bone or shell, buttons found in the landfill are made of wood.

Feature 27 is apparently a buried "living surface" that was encountered during the excavation of Lot 33 (Small Finds Table 4.29). Glass and ceramic data suggest that it was deposited sometime between 1790 and 1857. Among the small finds recovered, items from the Personal group are the most common. These artifacts include 8 buttons, 6 of which are made of bone, and 5 coins, and coin-like objects. Sixteen pins (Sewing group) were also recovered from this feature. The frequency of items from the Personal and Sewing groups, which together number 36 out of a total of 43 small finds artifacts, corroborates that the "living surface" deposit represents a domestic accumulation.

The next feature of interest is Feature 30, a box found in Lot 32 (Small Finds Table 4.30). Again, the ceramic data suggest that the contents of the box represent redeposited fill; however, glass artifacts appear to represent a primary deposition, in this instance domestic rather than commercial, that occurred sometime between 1795 and 1820. The small finds from this box include items from every functional group with the exception of the Prehistoric group. The Activities group numbers 28 artifacts and includes both hardware items and miscellaneous metal scrap materials. The Personal group, which contains 16 artifacts, includes buttons of bone or various metals (copper alloy, tin or zinc alloy, and pewter) as well as combs, a bracelet, and a cufflink. The Furniture and Sewing groups, each comprising 8 artifacts, include upholstery tacks, drawer knobs, and, from the Sewing group, pins. Two items from the Arms group are a gunspall from level 1 and a musketball from level 3; a cutlery handle from the Kitchen group completes the small finds assemblage from this box. In all, a total of 45 small finds artifacts were recovered.

The next feature of importance is Feature 32, a stone privy located in Lot 23. Again, the ceramic data suggest that the contents of the feature were redeposited fill, apparently in this instance dug from Feature 34, a "pit", however, the glass artifacts indicate a primary commercial deposit dated between 1840 and 1880. Only 10 small finds artifacts were recovered from this feature; these are almost evenly divided between Personal group items (5) and Kitchen group items (4) (Small Finds Table 4.31). One piece of metal scrap (Activities group) was also found. The frequency of Personal and Kitchen group items would not appear to relate to the artifacts from the commercial deposit (both ceramic and glass) found in this feature; however, the distribution of small finds artifacts found in Feature 34, a primary commercial deposit in this same lot, is virtually identical to that from Feature 32.

Feature 34, the "pit", or probably more accurately, an area of depressed fill east of the wharf/grillage in Lot 23, contained a great many ceramics and glass artifacts that suggest a single primary commercial deposit dating between 1795 and 1830. Ceramic and glass mends were found to occur throughout all five levels identified on the basis of soil descriptions (see Ceramic Analysis, this chapter; see also Small Finds Table 4.32). Level 1 contained 12 artifacts from the Activities group, and 4 Personal group items. Level 2 contained 3 Personal group items, and one item each from the Activities and Kitchen groups. Level 3 contained only Kitchen group items (8) and Activities group items (2). Level 4 contained 5 Personal group items. Finally, Level 5 contained no Personal group items, but 3 artifacts from the Activities group and 2 from the Kitchen group.

Another significant feature excavated in Lot 23 was Feature 36, a small wood box filled with glass and ceramics which seem to represent a primary commercial or domestic deposit dating to about 1809. The majority of the 15 small finds recovered from this feature are items from the Personal group; this includes 6 bone buttons, a bone comb, a British naval medallion, and a colored glass bead (Small Finds Table 4.33). The remaining small finds from Feature 36 include 2 marbles and a domino (Activities group), and a pewter spoon (Kitchen group).

Feature 41, a large rectangular privy in Lot 22, contained 146 small finds artifacts, the greatest number recovered from any single feature (Small Finds Table 4.34). Ceramics and glass artifacts recovered from this privy suggest that the fill from this feature represents a primary commercial deposit which appears to date from the late-eighteenth or early-nineteenth centuries; during this time, china and glass stores were located in Lot 22. Small finds materials from this feature include materials from all the functional groups except the Prehistoric group. Items from the Personal group (66 artifacts) predominate. Also contributing significantly to the total number of artifacts recovered from this feature were materials from the Activities group (34 artifacts), and Kitchen group (30 artifacts). Level 1 contained 64 artifacts from the Personal group, which are 97 percent of all the Personal group artifacts recovered from this feature. Many of these are buttons, particularly bone buttons that account for 24 of the 29 buttons found. Also contributing to the small finds assemblage in this level are a tar brush base, and four scrub brush bases or base fragments. Level 2 in Feature 41 also contained a scrub brush base. Together these account for all of the scrub (and tar) brushes found at the 175 Water Street block. Their occurrence in these strata is particularly interesting since New York City Directories and Tax Records indicate that a brush and bellows maker moved to the Lot 22 property in 1809, apparently supplanting the china and glass store which had been located on this lot.

Other artifacts recovered in significant numbers from Feature 41, include 30 items from the Kitchen group: 25 in Level 1, and 5 in Level 2. Most of these are cutlery artifacts including 12 spoons, 8 of them made of pewter. Small finds from the landfill below this feature are very similar to those from the levels within the feature. A tool handle, bottle stoppers, a pin, a button, and a bead were recovered from this landfill.

The next feature of particular significance is Feature 43, a large rectangular privy located in Lot 21. The ceramics and glass recovered from this feature suggest the feature-fill developed as a primary domestic deposit mixed with redeposited fill. Thirty-nine small finds artifacts were recovered from this feature (Small Finds Table 4.35). Level 1 contained 5 Activities group items, including what appears to be a wood caliper, the only one found on the 175 Water Street block. In Level 2, two fragments of two different one-inch rulers were found, again the only such artifacts recovered from the site. Also found in this feature were a variety of items such as upholstery tacks (Furniture group), marbles (Activities group), and bone buttons (Personal group).

Although these deposits appear to span a range of time from the mid-eighteenth to mid-nineteenth centuries, no one item from the Sewing group was found in this feature. This is particularly unusual since New York City Directories and Tax Records indicate a tailor shop in Lot 21 from 1796 to 1803. The landfill below Feature 43 contained only one miscellaneous baked clay fragment and a bone cutlery handle.

Feature 49 was a box or cofferdam located in Lot 20. Both ceramics and glass from the feature indicate that it was a primary domestic deposit, probably filled in in one episode, sometime between 1795 and 1820. Forty-seven small finds artifacts were recovered, most of them from the Personal group (Small Finds Table 4.36). These include buttons (10), combs (5), jewelry parts (3), buckles (2), and a few other miscellaneous items. Also found were items from the Kitchen group (8), the Sewing group (2), and the Activities group (13). Several of the items in the Activities group, such as a lead weight and two wood pulley wheels, appear to indicate some mixing of commercial artifacts into what otherwise appears to be a domestic deposit.

The next feature of interest is Feature 50, a rectangular privy cut into the wharf/grillage in Lot 19. Ceramic analysis suggests a redeposited fill including miscellaneous refuse; glass artifacts seem to represent a primary domestic dating from 1780 to 1830. Only 6 small finds artifacts were recovered from this feature, 2 from the Kitchen group and 4 from the Personal group (Small Finds Table 4.37).

Feature 51, a rectangular privy in Lot 18, appears to contain, on the basis of the glass and ceramics materials recovered, a primary domestic deposit dating to sometime beteen 1790 and 1820. This primary deposit was found in a redeposited fill matrix. The single small finds artifact from level 1 was a pewter plate, the only such plate found on the site. Level 2 contained a gunspall (Arms group), various items from the Activities group including metal scraps, toys, a wood dowel, and a wood peg. Also found in Level 2 were pins (Sewing group) and various Personal group items. In addition, a biface fragment and piece of chert debitage recovered from this feature were included in the Prehistoric group; the artifacts were from the redeposited fill (Small Finds Table 4.38).

The next two features to be discussed were deeptests excavated with a backhoe into the original landfill in Lot 29/30 Unit 1 (Feature 55), and Lot 29/30 Unit 2 (Feature 56) (Small Finds Tables 4.39 and 4.40). From Feature 55, 32 small finds artifacts were recovered which, except for one musketball (Arms group), a cutlery handle (Kitchen group), and a drawer pull knob (Furniture group), are divided between 18 Activities group items and 11 Personal group items (Small Finds Table 4.39). A fragment of insulated electric wire found in Level 3, which is otherwise securely dated to 1763, must be interpreted as contamination from recent strata.

Small finds artifacts found in Feature 56 are somewhat different in the percentages of artifacts contained within the various functional groups, but not dramatically so (Small Finds Table 4.40). As in Feature 55, Personal group artifacts contribute substantially to the total number of artifacts recovered. Buttons, particularly wood buttons which number 5 out of a total of 11 buttons recovered, form the bulk of the Personal group artifacts. For both features, preservation appears to be particularly good as evidenced by the presence of scraps of fabric and other artifacts made of organic materials.

The last feature of significance to be discussed is Feature 57, a barrel that apparently contained primary domestic glass and ceramic deposit dating to sometime between 1790 and 1830. Only one small finds artifact, aside from the barrel itself, was recovered from this feature (Small Finds Table 4.41). This was a square-shaped wood peg, possibly a cask bung.

In summary, the small finds artifact category includes a great diversity of artifacts that reflect the varied activities pursued during the occcupation of the 175 Water Street block. Because of the great diversity of small finds materials, artifact patterning, presumably reflecting behavioral pattering, is most usefully analyzed in terms of the functional groupings adapted from South (1977).

With respect to these functional groupings, it appears that for both commercial and domestic deposits, Activities group and Personal group artifacts are the most prevalent artifacts. Wholly domestic deposits seem to have a somewhat higher frequency of Personal group items and also a slightly greater diversity of artifactual materials; this is especially true of materials from the Kitchen and Sewing groups. Fill deposits by the nature of their composition exhibited as great a diversity of artifacts as did the features, but provided no activity information that could be associated with occupation of the block.

Small Finds Table 4.18 175 WATER STREET: Artifact Classes by Functional Group (Modified from South 1977)

ARTIFACT GROUP	ARTIFACT CLASSES
Arms	Lead Sprue
	Lead Musketballs
	Lead Cannonball
	Gunflints and gunspalls
Activities	Pharmaceutical
	Commercial/Manufacturing Debris
	Fishing Equipment
	Hardware
	Line
	Lighting Equipment
	Brushes
	Stable Related
	Printing Press Related
	Paper
	Writing Instruments
	Measuring Devices
	Casks
	Toys
	Miscellaneous Worked Metal and Scrap
	Miscellaneous Worked Organic Materials
	Miscellaneous Worked Inorganic Materials
Kitchen	Bottle Stoppers
	Knives
	Spoons
	Cutlery Handles
	Iron Kettle Fragments
	Miscellaneous Kitchen Artifacts
Sewing	Pins
	Thimbles
	Copper Alloy Eye
Personal	Buttons
	Cufflinks
	Buckles
	Glass Insets - Stones
	Beads
	Combs
	Wig Curlers
	Fabric Scraps
	Fan Parts
	Coins and Coin-like Objects
	Miscellaneous Items
Furniture	Furniture Handles and Plates
	Furniture Caster
	Clothes Hooks and Pegs
	Clock Parts
	Furniture Hinges
	Trunk Parts
	Rattan Frame Fragments
	Picture Frame Fragments
	Upholstery Tacks
	Miscellaneous Furniture Part
Prehistoric	Ceramic Sherds
	Knife
	Woodworking Scraper
	Biface Fragment
	Ground Stone Fragment (Steatite)
	Utilized Flake
	Debitage

Small Finds Table 4.19 175 WATER STREET: Number and Percent of Arms Group Artifacts--Counted in Fragments

ARMS GROUP	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Lead Sprue	1	-	1.5
Lead Musketballs	23	-	34.3
Lead Cannonball	1	-	1.5
Gunflints -			
Honey brown	5	50.0	7.5
Brown	3	30.0	4.5
Grey	1	10.0	1.5
Grey/black	1	10.0	1.5
Total -	10	100.0	14.9
Gunspalls -			
Honey brown	4	13.8	6.0
Brown	1	3.4	1.5
Grey	8	27.6	11.9
Grey/black	13	44.8	19.4
Total -	29	100.0	43.3
Knife scabard (copper alloy)	1	-	1.5
Bullet shell	1	-	1.5
Arrow tip	1	-	1.5
TOTAL:	67	-	100.0

Small Finds Table 4.20 175 WATER STREET: Number and Percent of Activities Group Artifacts

ACTIVITIES GROUP	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Pharmaceutical			
Pipette/Ampule Fragments	2	7.1	.1
Glass Tubing	2	7.1	.1
Rubber Stoppers	11	39.3	.4
Syringes - Blunt Point	7	25.0	.2
Other	6	21.4	.2
Total	28	100.0	1.0
Commercial/Manufacturing			
Button Blanks - Bone	14	16.3	.5
Button Blanks - Tortoise Shell	17	19.8	.6
Lead Bale Seals	16	18.6	.5
Lead/Brass Weights	10	11.6	.3
Kiln Furniture	19	22.1	.6
Kiln Vent Plug	1	1.2	.0
Kiln Waster	3	3.5	.1
Crucible - Stoneware	5	5.8	.2
Crucible - Iron	1	1.2	.0
Total	86	100.0	2.9
Fishing Equipment			
Fishing Sinkers	5	-	.2
Hardware			
Miscellaneous Fasteners	18	16.8	.6
Washers	9	8.4	.3
Rivets	8	7.4	.3
Spigots	5	4.7	.2
Name Plates	4	3.7	.1
Padlock	1	.9	.0
Door Latch / Handle	2	1.8	.1
Wood Pulley Wheel	4	3.7	.1
Sheave	5	4.7	.2
Other Pulley	2	1.8	.1
Wrench	1	.9	.0
Punch	2	1.8	.1
Gouge	2	1.8	.1
Hammer	1	.9	.0
Mallet	1	.9	.0
Pintle	1	.9	.0
Bucket	6	5.6	.2
Unspecified Tool Handles	11	10.3	.4
Other Tools	2	1.8	.1
Other Hardware	22	20.6	.7
Total	107	100.0	3.7
Line			
Rope	49	98.0	1.7
Thread	1	2.0	.0
Total	50	100.0	1.7

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Small Finds Table 4.20 (continued)

ACTIVITIES GROUP (continued)	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Lighting Equipment			
Candlesnuffer	2	12.5	.1
Lamp Parts	4	25.0	.1
Light Bulb	2	12.5	.1
Rod - Carbon Arc Lamp	8	50.0	.3
Total	16	100.0	.5
Brushes			
Scrub brush base	5	41.7	.2
Tar brush base	1	8.3	.0
Paint brush handle	3	25.0	.1
Wire brush handle	1	8.3	.0
Other brush	2	16.7	.1
Total	12	100.0	.4
Stable Related			
Spur	1	25.0	.0
Horseshoe	1	25.0	.0
Sleigh bell	1	25.0	.0
Cow bell	1	25.0	.0
Total	4	100.0	.1
Printing Press Related			
Printing Plate - Rubber	5	83.3	.2
Brass Typeset	1	16.7	.0
Total	6	100.0	.2
Paper			
Newsprint	4	44.4	.1
Labels	2	22.2	.1
Unspecified type	3	33.4	.1
Total	9	100.0	.3
Writing Instruments			
Slate Pencil	16	64.0	5.4
Lead Pencil	6	24.0	.2
Graphite Fragment	2	8.0	.1
Rubber Eraser	1	4.0	.0
Total	25	100.0	.9
Measuring Devices			
Wood Caliper	1	33.4	.0
Inch Ruler	2	66.6	.1
Total	3	100.0	.1
Casks			
Staves	151	59.2	5.2
Ends	29	11.4	1.0
Withie	60	23.5	2.1
Ferrous Metal Hoop	2	.8	.1
Bung	1	.4	.0
Other	12	4.7	.4
Total	255	100.0	8.7

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Small Finds Table 4.20 (continued)

	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
ACTIVITIES GROUP (continued)			
Toys			
Marbles	65	82.3	2.2
Miniature ceramic dishes	2	2.5	.1
Toy cannons	3	3.8	.1
Ceramic figurine	2	2.5	.1
Gaming counter	3	3.8	.1
Chess piece	1	1.3	.0
Domino	1	1.3	.0
Other	2	2.5	.1
Total	79	100.0	2.7
Miscellaneous Worked Metal and Scrap			
Copper	157	34.6	5.4
Copper Alloy	130	28.6	4.4
Lead	121	26.7	4.1
Ferrous Metal	26	5.7	.9
Tin / Zinc Alloy	12	2.6	.4
Tin	3	.7	.1
Other	5	1.1	.2
Total	454	100.0	15.5
Miscellaneous Worked Organic Materials			
Wood Dowel	10	.6	.3
Wood Peg	8	.5	.3
Wood Pin	2	.1	.1
Wood Screw	2	.1	.1
Wood Trunnel	38	2.3	1.3
Wood Disc	8	.5	.3
Wood Key	2	.1	.1
Wood Square Peg	3	.2	.1
Wood Needle / Awl	1	.0	.0
Wood Deadeye	1	.0	.0
Wood Bilge Pump	5	.3	.2
Unspecified Wood Handle	1	.0	.0
Miscellaneous Worked Wood	193	11.9	6.6
Ship Sheathing	5	.3	.2
Wood / Bark Fragments	1285	79.1	43.9
Unspecified Worked Bone	29	1.8	1.0
Bone Spindles	3	.2	.1
Unspecified Worked Ivory	1	.0	.0
Cork Wood Fragments	12	.7	.4
Pitch Lumps	12	.7	.4
Other	3	.2	.1
Miscellaneous Worked Inorganic Materials			
Baked Clay Fragments	3	1.9	.1
Whetstone/grindstone	4	2.5	.1
Import chert cobble/flake	25	15.6	.9

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Small Finds Table 4.20(continued)

ACTIVITIES GROUP (continued)	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Miscellaneous Worked Inorganic Materials (cont.)			
Insulated Electric Wire	8	5.0	.3
Miscellaneous Rubber Fragments			
Fragments	26	16.3	.9
Miscellaneous Plastic Fragments	5	3.1	.2
Fiberboard Fragments	84	52.5	
Other	5	3.1	.2
Total	160	100.0	5.5
TOTAL:	2926	-	100.0

(note - number in all cases represents fragment count, rather than MNV count)

Small Finds Table 4.21 175 WATER STREET: Number and Percent of Kitchen Group Artifacts

KITCHEN GROUP	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Bottle Stoppers			
Cork	65	66.3	36.3
Wood	20	20.4	11.2
Rubber	3	3.1	1.7
Metal Screw Cap	10	10.2	5.6
Total	98	100.0	54.7
Knives			
Bone and Ferrous Metal	2	66.7	1.1
Ferrous Metal	1	33.3	.6
Total	3	100.0	1.7
Spoons			
Silver/Silver Plated	4	22.2	2.2
Copper Alloy	2	11.1	1.1
Ferrous Metal	2	11.1	1.1
Pewter	10	55.6	5.6
Total	18	100.0	10.1
Cutlery Handles			
Bone	27	61.4	15.1
Wood	2	4.5	1.1
Antler	4	9.1	2.2
Bone and Ferrous Metal	9	20.5	5.0
Ferrous Metal	1	2.3	.6
Tin/Zinc Alloy	1	2.3	.6
Total	44	100.0	24.6
Iron Kettle Fragments	8	-	4.5
Miscellaneous Kitchen Artifacts			
Pewter Plate	1	12.5	.6
Pewter Pepper Mill	2	25.0	1.1
Bone Napkin Ring	1	12.5	.6
Wood Bowl	1	12.5	.6
Coconut Shell Bowl	1	12.5	.6
Other	2	25.0	1.1
Total	8	100.0	4.5
TOTAL:	179	-	100.0

Small Finds Table 4.22 175 WATER STREET: Number and Percent of Sewing Group Artifacts

SEWING GROUP		NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Pins				
	Gold and Gold Plate	3	2.0	1.9
	Copper Alloy	101	49.5	47.9
	Tin Plated Copper Alloy	98	48.0	46.4
	Unspecified Material	1	.5	.5
	Total	204	100.0	96.7
Thimbles				
	One Piece - Plain	1	16.7	.5
	One Piece - Decorated	4	66.7	1.9
	Two Piece - Plain	1	16.7	.5
	Total	6	100.0	2.8
Copper Alloy Eye		1	-	.5
TOTAL:		211	-	100.0

Small Finds Table 4.23 175 WATER STREET: Number and Percent of Personal Group Artifacts

PERSONAL GROUP	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Buttons			
Silver/Silver Plated	2	.5	.3
Copper	3	.7	.4
Copper Alloy	71	17.7	9.2
Ferrous Metal	10	2.5	1.3
Pewter	8	2.0	1.0
Tin/Zinc Alloy	17	4.2	2.2
Tin Plated Copper Alloy	1	.2	.1
Tin Plated Ferrous Metal	3	.7	.4
Gold Plated Copper Alloy	2	.5	.3
Bone	166	41.3	21.4
Wood	73	18.2	9.4
Horn	2	.5	.3
Shell (Mother of Pearl)	20	5.0	2.6
Tortoise Shell	2	.5	.3
Milk glass	2	.5	.3
Colored glass	5	1.2	.6
Porcelain	2	.5	.3
Ferrous Metal & Copper Alloy	1	.2	.1
Ferrous Metal & Glass	2	.5	.3
Copper Alloy & Glass	1	.2	.1
Unspecified Composite	4	1.0	.5
Other	5	1.2	.6
Total	402	100.0	51.9
Cufflinks			
Copper Alloy	11	57.9	1.4
Pewter	2	10.5	.3
Ivory	1	5.3	.1
Copper Alloy & Glass	3	15.8	.4
Unspecified Composite	2	10.5	.3
Total	19	100.0	2.5
Buckles			
Gold/Gold Plated	1	1.9	.1
Copper	1	1.9	.1
Copper Alloy	49	90.6	6.3
Ferrous Metal	3	5.6	.4
Total	54	100.0	6.9
Glass Insets - Stones			
Lead glass	14	56.0	1.8
Soda glass	2	8.0	.3
Colored glass	9	36.0	1.2
Total	25	100.0	3.2

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Small Finds Table 4.23 (continued)

PERSONAL GROUP	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Buttons			
Silver/Silver Plated	2	.5	.3
Copper	3	.7	.4
Copper Alloy	71	17.7	9.2
Ferrous Metal	10	2.5	1.3
Pewter	8	2.0	1.0
Tin/Zinc Alloy	17	4.2	2.2
Tin Plated Copper Alloy	1	.2	.1
Tin Plated Ferrous Metal	3	.7	.4
Gold Plated Copper Alloy	2	.5	.3
Bone	166	41.3	21.4
Wood	73	18.2	9.4
Horn	2	.5	.3
Shell (Mother of Pearl)	20	5.0	2.6
Tortoise Shell	2	.5	.3
Milk glass	2	.5	.3
Colored glass	5	1.2	.6
Porcelain	2	.5	.3
Ferrous Metal & Copper Alloy	1	.2	.1
Ferrous Metal & Glass	2	.5	.3
Copper Alloy & Glass	1	.2	.1
Unspecified Composite	4	1.0	.5
Other	5	1.2	.6
Total	402	100.0	51.9
Cufflinks			
Copper Alloy	11	57.9	1.4
Pewter	2	10.5	.3
Ivory	1	5.3	.1
Copper Alloy & Glass	3	15.8	.4
Unspecified Composite	2	10.5	.3
Total	19	100.0	2.5
Buckles			
Gold/Gold Plated	1	1.9	.1
Copper	1	1.9	.1
Copper Alloy	49	90.6	6.3
Ferrous Metal	3	5.6	.4
Total	54	100.0	6.9
Glass Insets - Stones			
Lead glass	14	56.0	1.8
Soda glass	2	8.0	.3
Colored glass	9	36.0	1.2
Total	25	100.0	3.2

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Small Finds Table 4.23 (continued)

PERSONAL GROUP (cont.)	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Beads			
Copper Alloy	1	2.6	.1
Horn	1	2.6	.1
Shell	1	2.6	.1
Amber	1	2.6	.1
Jet	1	2.6	.1
Colored Glass	25	64.1	3.2
Other Glass	6	15.4	.8
Quartz Crystal	1	2.6	.1
Fired Clay	2	5.1	.3
Total	39	100.0	5.0
Combs			
Lead	3	5.7	.4
Bone	23	43.4	3.0
Horn	31	58.5	4.0
Vulcanite	1	1.9	.1
Total	58	100.0	7.5
Wig Curlers			
WB / 2 Dot	3	12.5	.4
Plain	18	75.0	2.3
Broken - No End	2	8.3	.3
Unspecified Type	1	4.2	.1
Total	24	100.0	3.1
Fabric Scraps			
Wool	7	25.0	.9
Cotton	4	14.3	.5
Linen / Cotton	4	14.3	.5
Silk	2	7.1	.3
Felt	3	10.7	.4
Burlap	1	3.6	.1
Unspecified type	7	25.0	.9
Total	28	100.0	3.6
Fan Parts			
Fan Rib - Bone	19	73.1	2.5
Fan Rib - Wood	2	7.7	.3
Fan Handle - Bone	5	19.2	.6
Total	26	100.0	3.4
Coins and Coin-like Objects	64	-	8.3

(continued next page)

Small Finds Table 4.23 (continued)

PERSONAL GROUP (cont.)	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
Miscellaneous Items			
Bracelet	1	3.0	.1
Rings	5	15.2	.6
Keys	2	6.1	.3
Glass Spectacles	2	6.1	.3
Hair Brush Fragments (Bone)	7	21.2	.9
Hair Fastener (Bone)	2	6.1	.3
Jewelry Parts	12	36.4	1.5
Other	2	6.1	.3
Total	33	100.0	4.3
TOTAL:	775	-	100.0

(note - number in all cases represents fragment count, rather than MNV count)

Small Finds Table 4.24 175 WATER STREET: Number and Percent of Furniture Group Artifacts

	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
FURNITURE GROUP			
Furniture Handles and Plates			
Bail Handles	4	12.5	3.1
Pull Knobs	10	31.5	7.9
Handles - Unspecified Type	8	25.0	6.3
Plates - Unspecified Type	5	15.5	3.9
Key Escutcheon Plate	5	15.5	3.9
Total	32	100.0	25.2
Furniture Caster	1	-	.8
Clothes Hooks and Pegs	3	-	2.4
Clock Parts (Spandrel)	2	-	1.6
Furniture Hinges	3	-	2.4
Trunk Parts	3	-	2.4
Rattan Frame Fragments	17	-	13.4
Picture Frame Fragments	2	-	1.6
Upholstery Tacks (Copper Alloy)			
Flat Head	12	19.0	9.4
Domed Head	51	81.0	40.2
Total	63	100.0	49.6
Miscellaneous Furniture Part	1	-	.8
TOTAL:	127	-	100.0

Small Finds Table 4.25 175 WATER STREET: Number and Percent of Prehistoric Group Artifacts

	NUMBER	PERCENT WITHIN CLASS	PERCENT WITHIN GROUP
PREHISTORIC GROUP			
Ceramic (Late Woodland) Sherds	2	-	15.4
Knife	1	-	7.7
Woodworking Scraper	1	-	7.7
Biface Fragment	1	-	7.7
Ground Stone Fragment (Steatite)	2	-	15.4
Utilized Flake	2	-	15.4
Debitage	4	-	30.8
TOTAL:	13	-	100.0

(note - number in all instances represents fragment count)

SMALL FINDS TABLE 4.26 175 WATER STREET: Distribution of Small Finds Artifacts by Feature - Note -Two Counts Are Given for Activities Group Items

Lot #	Feat. No.	Arms	Activities*	Activities**	Kitchen	Furniture	Sewing	Personal	Prehistoric	Total*	Total**
36	1	-	3	(8)	-	3	4	26	-	36	(41)
33	2	2	22	(26)	5	1	1	15	-	46	(50)
	3	-	4	(5)	-	1	2	6	-	13	(14)
	4	1	-	-	-	-	1	3	-	5	(5)
	5	-	1	(1)	1	2	-	4	-	8	(8)
	8	-	2	(2)	-	-	-	1	-	3	(3)
	(9)	-	-	(1)	-	-	-	-	-	-	(1)
	12	-	1	(1)	-	-	-	-	-	1	(1)
	15	-	1	(1)	-	-	-	-	-	1	(1)
	16	-	3	(3)	-	-	-	-	-	3	(3)
	17	1	-	(10)	1	1	-	1	-	4	(14)
	18	-	-	-	-	-	7	4	-	11	(11)
	19	-	-	(1)	-	-	1	-	-	1	(2)
	20	-	1	(2)	1	-	3	2	-	7	(8)
	22	-	-	(1)	-	-	-	2	-	2	(3)
	23	-	1	-	-	-	-	1	-	2	(2)
	24	1	-	-	-	-	1	2	-	4	(4)
	25	-	3	(4)	-	2	-	5	-	10	(11)
	26	-	1	(1)	-	-	7	1	-	9	(9)
	27	1	1	(5)	-	1	16	20	-	39	(43)
	28	-	2	(4)	-	-	-	3	-	5	(7)
	(29)	-	-	(1)	-	-	-	-	-	-	(1)
32	30	2	10	(28)	1	8	8	16	-	45	(63)
30	32	-	-	(1)	4	-	-	5	-	9	(10)
23	33	1	-	-	-	-	-	1	-	2	(2)
	34	-	2	(18)	11	-	-	12	-	25	(41)
	35	-	1	(1)	-	-	-	1	-	2	(2)
	36	-	3	(4)	2	-	-	9	-	14	(15)

(continued)

* Excluding all GM, GW, GZ
**Including all GM, GW, GZ

SMALL FINDS TABLE 4.26 (continued)

Lot #	Feat. No.	Arms	Activities*	Activities**	Kitchen	Furniture	Sewing	Personal	Prehistoric	Total*	Total**
23	37	-	-	-	-	-	-	1	-	1	(1)
	38	-	-	(4)	-	-	-	2	-	2	(6)
	39	-	-	(1)	-	-	-	2	-	2	(3)
	40	-	-	(5)	-	2	-	-	-	2	(2)
22	41	4	19	(34)	30	9	3	66	-	131	(146)
21	42	-	-	(8)	1	-	1	2	-	4	(12)
	43	2	9	(15)	1	5	-	16	-	33	(39)
	44	-	1	(5)	1	1	-	3	-	6	(10)
	45	-	4	(108)	1	-	-	-	-	5	(109)
	46	-	-	-	-	-	-	1	-	1	(1)
20	47	-	4	(7)	-	-	-	4	-	8	(11)
	48	-	-	(3)	1	1	-	3	1	6	(9)
	49	-	5	(13)	8	-	2	24	-	39	(47)
19	50	-	-	-	2	-	-	4	-	6	(6)
18	51	1	3	(10)	1	-	5	10	2	22	(29)
	52	-	1	(2)	1	-	1	5	-	8	(9)
	53	-	-	-	2	-	-	1	-	3	(3)
	54	-	-	(1)	-	-	-	1	-	1	(2)
30	55	1	8	(18)	1	1	-	11	-	22	(32)
29	56	1	6	(8)	3	2	2	15	-	29	(31)
33	57	-	26	(1)	-	-	-	-	-	26	(27)
TOTALS		18	146	(402)	83	40	65	305	3	660	(916)

SMALL FINDS TABLE 4.26 175 WATER STREET: Number and Percent within Functional Groups

FEATURE/ LEVEL	ARMS #	%	PERSONAL #	%	SEWING #	%	KITCHEN #	%	ACTIVITIES #	%	FURNITURE #	%	PREHISTORIC #	%	TOTALS #	%
1.1	-	-	21	(61.8)	2	(5.9)	-	-	8	(23.5)	3	(8.8)	-	-	34	(100.0)
1.2	-	-	5	(71.4)	2	(28.6)	-	-	-	-	-	-	-	-	7	(100.0)
LANDFILL														TOTAL	41	(100.0)
1.9	-	-	-	-	15	(93.8)	-	-	1	(6.2)	-	-	-	-	16	(100.0)

TABLE 4.10a: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 1 AND IN UNDERLYING LANDFILL

FEATURE/ LEVEL	ARMS #	%	PERSONAL #	%	SEWING #	%	KITCHEN #	%	ACTIVITIES #	%	FURNITURE #	%	PREHISTORIC #	%	TOTALS #	%
2.1	-	-	10	(43.5)	-	-	1	(4.3)	12	(52.2)	-	-	-	-	23	(100.0)
2.2	2	(7.1)	5	(17.9)	1	(3.6)	4	(14.3)	15	(53.6)	1	(3.6)	-	-	28	(100.0)
LANDFILL														TOTAL	51	(100.0)
2.9	1	(11.1)	5	(55.6)	-	-	-	-	3	(33.3)	-	-	-	-	9	(100.0)

TABLE 4.10b: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 2 AND IN UNDERLYING LANDFILL

SMALL FINDS TABLE 4.26 (continued)

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
27.1	1	(2.3)	20	(46.5)	16	(37.2)	-	-	5	(11.6)	1	(2.3)	-	-	43	(100.0)

TABLE 4.10c: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 27

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
30.1	1	(2.2)	7	(15.2)	8	(17.4)	1	(2.2)	23	(50.0)	6	(13.0)	-	-	46	(100.0)
30.2	-	-	6	(60.0)	-	-	-	-	4	(40.0)	-	-	-	-	10	(100.0)
30.3	1	(20.0)	1	(20.0)	-	-	-	-	1	(20.0)	2	(40.0)	-	-	5	(100.0)
30.4	-	-	2	(100.0)	-	-	-	-	-	-	-	-	-	-	2	(100.0)
														TOTAL	63	(100.0)

TABLE 4.10d: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 30

SMALL FINDS TABLE 4.26 (continued)

FEATURE/ LEVEL	ARMS		PERSONAL		SEWING		KITCHEN		ACTIVITIES		FURNITURE		PREHISTORIC		TOTALS	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
32.1	-	-	2	(40)	-	-	2	(40)	1	(20)	-	-	-	-	5	(100.0)
32.2	-	-	3	(60)	-	-	2	(40)	-	-	-	-	-	-	5	(100.0)
														TOTAL	10	(100.0)

TABLE 4.10e: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 32

FEATURE/ LEVEL	ARMS		PERSONAL		SEWING		KITCHEN		ACTIVITIES		FURNITURE		PREHISTORIC		TOTALS	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
34.1	-	-	4	(25)	-	-	-	-	12	(75)	-	-	-	-	16	(100.0)
34.2	-	-	3	(60)	-	-	1	(20)	1	(20)	-	-	-	-	5	(100.0)
34.3	-	-	-	-	-	-	8	(80)	2	(20)	-	-	-	-	10	(100.0)
34.4	-	-	5	(100)	-	-	-	-	-	-	-	-	-	-	5	(100.0)
34.5	-	-	-	-	-	-	2	(40)	3	(60)	-	-	-	-	5	(100.0)
														TOTAL	41	(100.0)

TABLE 4.10f: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 34

SMALL FINDS TABLE 4.26 (continued)

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
36.1	-	-	8	(66.7)	-	-	-	-	4	(33.3)	-	-	-	-	12	(100.0)
36.2	-	-	1	(50)	-	-	1	(50)	-	-	-	-	-	-	2	(100.0)
														TOTAL	14	(100.0)

TABLE 4.10g: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 36

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
41.1	4	(33)	62	(51.2)	2	(1.7)	25	(20.7)	19	(15.7)	9	(7.4)	-	-	121	(100.0)
41.2	-	-	4	(16)	1	(4)	5	(20)	15	(60)	-	-	-	-	25	(100.0)
LANDFILL														TOTAL	146	(100.0)
41.9	-	-	2	(28.6)	1	(14.3)	3	(42.9)	1	(14.3)	-	-	-	-	7	(100.0)

TABLE 4.10h: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 41 AND IN UNDERLYING LANDFILL

SMALL FINDS TABLE 4.26 (continued)

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
43.1	-	-	9	(52.9)	-	-	-	-	5	(29.4)	3	(17.6)	-	-	17	(100.0)
43.2	2	(10.5)	5	(26.3)	-	-	1	(5.3)	10	(52.6)	1	(5.3)	-	-	19	(100.0)
43.3	-	-	2	(66.7)	-	-	-	-	-	-	1	(33.3)	-	-	3	(100.0)
LANDFILL														TOTAL	39	(100.0)
43.9	-	-	-	-	-	-	2	(66.7)	1	(33.3)	-	-	-	-	3	(100.0)

TABLE 4.10i: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 43 AND IN UNDERLYING LANDFILL

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
49.1	-	-	24	(51.1)	2	(4.3)	8	(17)	13	(27.7)	-	-	-	-	47	(100.0)

TABLE 4.10j: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 49

SMALL FINDS TABLE 4.26 (continued)

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
50.1	-	-	4	(65.7)	-	-	2	(33.3)	-	-	-	-	-	-	6	(100.0)

TABLE 4.10k: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 50

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
51.1	-	-	-	-	-	-	1	(100)	-	-	-	-	-	-	1	(100.0)
51.2	1	(3.6)	10	(35.7)	5	(17.9)	-	-	10	(35.7)	-	-	2	(7.1)	28	(100.0)
														TOTAL	29	(100.0)

TABLE 4.10L: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 51

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
55.1	-	-	6	(37.5)	-	-	1	(6.3)	8	(50)	1	(6.3)	-	-	16	(100.0)
55.2	-	-	3	(33.3)	-	-	-	-	6	(66.7)	-	-	-	-	9	(100.0)
55.3	1	(33.3)	1	(33.3)	-	-	-	-	1	(33.3)	-	-	-	-	3	(100.0)
55.4	-	-	1	(25)	-	-	-	-	3	(75)	-	-	-	-	4	(100.0)
														TOTAL	32	(100.0)

TABLE 4.10m: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 55

SMALL FINDS TABLE 4.26 (continued)

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
56.1	1	(7)	6	(42.9)	2	(14.3)	3	(21.4)	1	(7.1)	1	(7.1)	-	-	14	(100.0)
56.2	-	-	5	(83.3)	-	-	-	-	1	(16.7)	-	-	-	-	6	(100.0)
56.3	-	-	2	(66.7)	-	-	-	-	-	-	1	(33.3)	-	-	3	(100.0)
56.4	-	-	2	(25)	-	-	-	-	6	(75)	-	-	-	-	8	(100.0)
														TOTAL	31	(100.0)

TABLE 4.10n: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 56

FEATURE/ LEVEL	ARMS #	ARMS %	PERSONAL #	PERSONAL %	SEWING #	SEWING %	KITCHEN #	KITCHEN %	ACTIVITIES #	ACTIVITIES %	FURNITURE #	FURNITURE %	PREHISTORIC #	PREHISTORIC %	TOTALS #	TOTALS %
57.1	-	-	-	-	-	-	-	-	26	(100)	-	-	-	-	26	(100.0)

TABLE 4.10o: DISTRIBUTION OF FUNCTIONAL GROUPS WITHIN FEATURE 57

COIN REPORT
(Steven Nicklas)

A total of sixty-four coins, medals, and coin-like objects were recovered from the excavation of 175 Water Street. Of these, fifty-one are identifiable; sixteen are British coins, three are American counterfeits of British coinage; one is minted in Britain for the Virginia colony; ten are mainly identified state issues, and fourteen are Federal American issues. Four coins are from Portugal, French Guiana, China, and the Spanish Empire. Two medals are both English: one is a 1761 bronzed coronation medal of Queen Charlotte, the other an eighteenth-century naval medallion. An unidentified jetton, or mathematical counter, possibly of German origin, was also recovered.

Of the fifteen valid British coins, four were issued for King William II, two for King George I, nine for King George II, and one for King George III. This last coin, a 1781 Hibernia halfpenny was issued in England for use in Ireland. It was struck in London during the British occupation of New York City, and is the only coin recovered from the excacation that was minted during the Revolutionary War.

Five known states are represented in the corpus of colonial coinage.[1]. These include: Virginia, one coin (coin 20); New Jersey, one coin (coin 21); New York, one coin (coin 22); Vermont, two coins (coins 23 and 24); and Connecticut, three coins (coins 25, 26, and 27). Three additional colonial coins were issued at unidentified mints. All of the fourteen Federal American issued coins recovered were struck between the years 1793 and 1909.

There is little question that the coins recovered from the site were circulated within the city of New York and to some degree reflect the economic, social, and political situation of the city at that time. However, since many of these coins were recovered from the landfill, and could have come from any section of the city, they are not necessarily relevant to the economic and/or social history of the individual lots.

It is safe to assume that most if not all of the Colonial coins arrived in the area of the city soon after they were struck. This assumption is based on the fact that New York City was a major American port in the colonial/revolutionary period; constant travel both to and from the city undoubtedly resulted in the active circulation of local as well as more distant coinage. The relatively good condition of most of the eighteenth-century coins from the site (with the excepteion of the issues of William III) suggests that they were lost soon after they were circulated, perhaps in the course of trade.

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[1] Although the Virginia halfpenny was the only true colonial coin recovered from the site, all coins minted in America prior to 1793 are referred to here as colonial, a practice followed by numismatic experts (Dory 1983: personal communication).

A chronological breakdown of the British and Colonial American coins reflects not only major historical events, such as the Revolutionary War and the English/Colonial coinage shortage (see Figure 4.6), but also localized events such as the filling of the lots and the establishment of the area as a mercantile district.

The first group of coins indicated on the chart (King William III) consists of coins issued before the lots were filled. Some of these coins probably remained in circulation until long after the lots were stabilized. This assumption is based on their archaeological context, their worn condition, and the fact that there were major coin shortages in the early and late-eighteenth century. Shortages were especially severe during the reigns of Queen Anne (1702-1714) and King George III (1760-1820) (Noel Hume 1969: 160-162).

No coins issued between 1702 and 1717 were recovered from the site. This gap is probably the result of the above mentioned shortage of coins that affected both England and her colonies.

The second group of coins, 1717-1754, appears to be a reflection of the efforts of Kings George I and George II to alleviate the copper coin shortage by producing a large number of halfpennies. The coins in this group were in circulation before, during, and after the stabilization of the lots which accounts for their recovery from original landfill as well as from somewhat later commercial and domestic deposits.

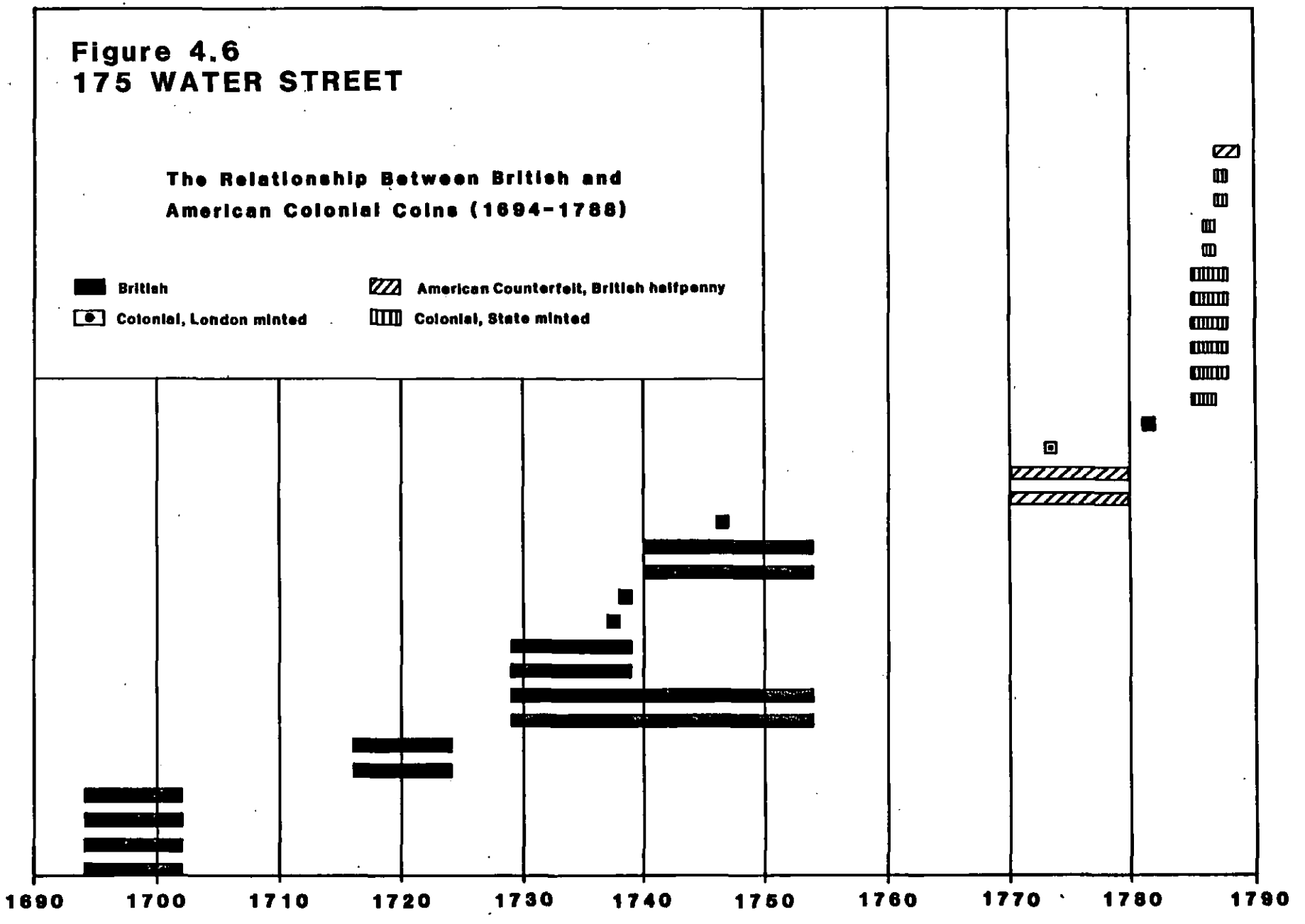
With one exception, 1754 marks the end of British coinage at the site. This immediate and dramatic break is due perhaps to two major historical events: the ever-present shortage of copper coins (worsened by the rapidly depleting copper supply) and the American Revolution. By 1775, the copper shortage was so severe that the Royal Mint stopped striking copper halfpennies and did not issue any further copper coinage until after 1797 (Noel Hume 1969:162). Three of four George III halfpennies (coins 16, 17, and 18) minted during this period are apparently American counterfeits. In addition to the counterfeits, coins from this period also include a 1773 Virginia halfpenny (coin 20) and the 1781 Hibernia halfpenny mentioned above (coin 19).

It is important to note that not only is the Hibernia halfpenny the only valid English coin of King George III in this assemblage, but also that it was struck during the British occupation of New York City. This coin, therefore, provides evidence of contact between the British garrison within the city and the rest of the British Empire.

The end of the war is reflected by a noticeable increase in the number of coins recovered from the site. With the exception of one counterfeit halfpenny of King George III (coin 16), all of these coins were colonial state coppers issued between 1783 and 1788. By the early 1790s, however, most, if not all, of these coins were replaced by issues of the Federal Government.

Throughout the course of the excavation, numerous coins of note were found; several have not been found previously in an archaeological context in New York City. These include; an American 1799 gold Half Eagle (coin 34) from a privy in Lot 20, a Spanish gold 1 escudo (1700-1724) (coin 33), a 1748 Portugese 10 reis piece (coin 31), and an American 1796-7 half dime (coin 35).

For more information concerning all of the recovered coins and medals, see the following coin appendix.


Figure 4.6
175 WATER STREET
The Relationship Between British and
American Colonial Coins (1694-1788)
British
Colonial, London minted
American Counterfeit, British halfpenny
Colonial, State minted
1690
1700
1710
1720
1730
1740
1750
1760
1770
1780
1790

175 Water Street Coins--Appendix A

Locus 33.02.020 Cat. #632 Level #1 Coin #1

Type: Coronation Medal of Queen Charlotte (bronze)

Obverse inscription: (C)HAR(L)OTT(A.)D(.G.M.GR.FR.ET H)IB(R)EG(INA)

Obverse inscripton translation: Charlotte, by the grace of God, Queen of Great Britian, France, and Ireland.

Obverse type: The diademed and draped bust of the Queen facing to the right.

Reverse inscription: QVAESIT(VM). MERITIS; in the exergue: CORON.XXII. SEPT.MDCCLIX(I).

Reverse inscription translation: Sought for her merits; in exergue: the 22nd coronation, September, 1761.

Reverse type: The Queen is standing in the center of the medal, facing a globe and altar to her right, while a winged figure of Victory crowns her.

Historical notes: This medal is a copy of the official coronation medal that was issued for the Queen by the Royal Household. The original medals were struck only in gold (150) and in silver (400). All bronze issues of the medal were struck by the Royal Mint Master for his private use. At present, the number of bronze medals issued is unknown; however, it is assumed to be quite small.

Reference: Brown 1980

Locus 19.03.001 Cat. #5061 Level #1 Coin #2

Type: Halfpenny of King William III (probable Type II, 1694-1702)

Obverse inscription: GVLIELMVS. (TERTIVS.)

Obverse type: The bust of the king, laureated, and cuirassed, facing to the right.

Reverse inscription: (BRITANNIA)

Reverse type: Blank

Historical notes: This coin shows a marked deterioration in workmanship; letters and figures of different sizes are used. The coin was issued at the London Mint.

Reference: Peck 1960

Locus 22.02.016 Cat. #5293 Level #1 Coin #3

Type: Halfpenny of King William III (1694-1702)

Obverse inscription: GVL(IELMVS. TERTIVS.)

Obverse type: The bust of the King, laureated and cuirassed, facing to the right.

Reverse inscription: (BRITANNIA)

Reverse Type: Blank

Historical notes: This copper halfpenny was issued at the London Mint.

Reference: Peck 1960

Locus 32.02.010 Cat. #98 Level #2 Coin #4

Type: Halfpenny of King William III (1694-1702)

Obverse inscription: GVL(IEMVS. TERTIVS.)

Obverse type: The bust of the King, laureated and cuirassed, facing to the right.

Reverse type: Blank

Historical notes: This copper halfpenny was issued at the London Mint.

Reference: Peck 1960

Locus 33.02.020 Cat. #632 Level #1 Coin #5

Type: Halfpenny of King William III (1694-1702)

Obverse inscription: GVLIEMVS. (TERTIVS.)

Obverse type: The bust of the King, laureated and cuirassed, facing to the right.

Reverse inscription: (B)RI(TANNIA)

Reverse type: Mostly blank; Britannia seated.

Historical notes: This copper halfpenny was issued at the London Mint.

Locus 33.04.039 Cat. #565 Level 1 Coin #6

Type: Halfpenny of King George I (1717-1724)

Obverse inscription: (GEORGIVS. REX.)

Obverse type: The bust of the king, facing right as above, but obscure.

Reverse inscription: (BRITANNIA)

Reverse type: Seated Britannia (obscure); all within a raised linear circle and a broad outer toothed border.

Historical notes: This copper halfpenny was issued at the London mint. The bust was cut by Croker.

Reference: Peck 1960

Locus 21.02.016 Cat. #38215 Level 1 Coin #7

Type: Halfpenny of George I (1717-1724)

Obverse inscription: GEORG(IVS. REX.)

Obverse type: The bust of the King, laureated and cuirassed, facing to the right; all within a raised linear circle and broad outer toothed border.

Reverse inscription: (BRITANN)I(A.)

Reverse type: Seated Britannia (obscure); all within a raised linear circle and a broad outer toothed border.

Historical notes: This copper halfpenny was issued at the London Mint. The bust was cut by Croker.

Reference: Peck 1960

Locus 23.04.058 Cat. #580 Level #1 Coin #8

Type: Halfpenny of King George II (1738)

Obverse inscription: (GEORG(IV)S.II.R(EX.)

Obverse type: The bust of the King, laureated and cuirassed, facing to the left. The coin is part of the first or "young head" series. The wreath shows 8 leaves and 3 berries, while the tie ribands are thin and almost straight. The "young head" series was issued between 1729 and 1739.

Reverse inscription: BRITA(NNI)A

Reverse type: Britannia seated to the left on a globe. In her right hand she holds a spray of leaves and in her raised left hand she graps a spear. By her left side is an ornamental oval shield bearing the crosses of St. George and St. Andrew. The exerque is a double line with the date 1738 below.

Historical notes: This copper halfpenny was issued at the London Mint. The bust was cut by Croker.

Reference: Peck 1960

Locus 33.02.020 Cat. #632 Level 1 Coin #9

Type: Halfpenny of King George II (1729-1739)

Obverse inscription: GE(ORGIVS.II.REX.)

Obverse type: The bust of the King, laureated and cuirassed facing to the left (as coin #8).

Reverse inscription: (BRITANNIA)

Reverse type: Blank

Historical notes: This copper halfpenny was issued at the London Mint. The bust was cut by Croker.

Reference: Peck 1960

Locus 32.02.010 Cat. #65 Level 1 Plate 4 Coin #10

Type: Halfpenny of George II (1737)

Obverse inscription: GEO(RGIVS.)II.(REX.)

Obverse type: The bust of the King, laureated and cuirassed, facing to the left (as coin #8).

Reverse inscription: (BRITA)N(NIA).

Reverse type: Seated Britannia, dated 1737 (as coin #7).

Historical notes: This copper halfpenny was issued at the London Mint. The bust was cut by Croker.

Reference: Peck 1960

Locus 18.02.023 Cat. #8130 Level 1 Coin #11

Type: Halfpenny of George II (1729-1739)

Obverse inscription: GEOR(G)IV(S.)II(.REX)

Obverse type: The bust of the king, laureated and cuirassed, facing left (as coin #8).

Reverse inscription: BRI(TAN)N(IA)

Reverse type: Seated Britannia (as coin #7).

Historical notes: This copper halfpenny was issued at the London Mint. The portrait was cut by Croker.

Reference: Peck 1960

Locus 23.04.058 Cat. #580 Level 1 Coin #12

Type: Halfpenny of King George II (1746)

Obverse inscription: G(EORG)IVS.II.REX.

Obverse type: The bust of the king, laureated and cuirassed, facing to the left. The coin is part of the second or "old head" series. The wreath shows 9 leaves and three berries, while the tie ribands are thicker and longer. The "old head" series was issued between 1740 and 1754.

Reverse inscription: BRITANNIA

Reverse type: Seated Britannia, dated 1746 (as coin #8).

Historical notes: This copper halfpenny was issued at the London Mint. The portrait was cut by Johann Sigismund Tanner.

Reference: Peck 1960

Locus 33.04.024 Cat. #600 Level 1 Coin #13

Type: Halfpenny of King George II (1740-1754)

Obverse inscription: (GEORGIVS.II.REX.)

Obverse type: The bust of the king, laureated and cuirassed, facing left (as coin #12, but very obscure).

Reverse inscription: (BRITANNIA)

Reverse type: Seated Britannia (as coin #8, but very obscure).

Historical notes: This copper halfpenny was issued at the London Mint. The portrait was cut by Johann Sigismund Tanner.

Reference: Peck 1960

Locus 21.01.002 Cat. #8005 Level 1 Coin #14

Type: Halfpenny of King George II (1740-1754)

Obverse inscription: (GEORGIVS.II.REX.)

Obverse type: The bust of the king, laureated and cuirassed, facing left (as coin #12, but very obscure).

Reverse inscription: (BRITANNIA)

Reverse type: Seated Britannia (as coin #12, but very obscure).

Historical notes: This copper halfpenny was issued at the London Mint. The portrait was cut by Johann Sigismund Tanner.

Reference: Peck 1960

Locus 33.01.020 Cat. #520 Level 2 Coin #15

Type: Halfpenny of King George II (1729-1754)

Obverse inscription: (GEORGIVS.II.REX.)

Obverse type: The bust of the king, laureated and cuirassed, facing to the left. Very obscure, type unknown.

Reverse inscription: (BRITANNIA)

Reverse type: Seated Britannia, very obscure.

Reference: Peck 1960

Locus 32.02.021 Cat. #215 Level 1 Coin #16

Type: Halfpenny of King George II (1787 or 1788)

Obverse inscription: GEORGIVS.III.REX.

Obverse type: The bust of the King, laureated and cuirassed, facing to the right. The wreath, which is tied behind the neck by two long ribands, shows 6 leaves and 4 berries. The armour that appears on the right shoulder consists of a shoulder strap with 4 scales and 5 broad plates below.

Reverse inscription: BRITANNIA

Reverse type: Seated Britannia, dated 1787 or 1788 (as coin #8).

Historical notes: Based on the crude style of this coin, and the fact that British copper halfpennies were issued for George II only between 1770 and 1775, this coin has been identified as a counterfeit. It has been estimated that by 1775 60% of the "British coinage" in America was counterfeit. This coin, as well as many of the other counterfeits, was probably issued at Newburgh, N.Y., by Thomas Machin.

References: Peck 1960; Noel Hume 1980

Locus 33.03.010 Cat. #241 Level 3 Coin #17

Type: Halfpenny of King George III (1770-1779)

Obverse inscription: GEORGIVS(.II.REX.)

Obverse type: The bust of the King, laureated and cuirassed facing right (very obscure).

Reverse inscription: BRITANNIA

Reverse type: Seated Britannia, dated 177? (as coin #8).

Historical notes: This coin was also identified as a counterfeit. This identification was based on the fact that the letters of both the obverse and reverse inscriptions touch the border of the coin, and that the coin itself is 5 mm smaller than original British issues. This coin was probably struck by Thomas Machin at Newburgh.

Locus 33.03.013 Cat. #138 Level 1 Coin #18

Type: Halfpenny of King George III (1770-1780)

Obverse inscription: (GEORGIVS.)III(.R)E(X.)

Obverse type: The bust of the King, laureated and cuirassed, facing right (obscure).

Reverse inscription: (BRITANNI)A

Reverse type: Seated Britania (very crude).

Historical notes: Based on the crude style of the coin and the fact that the obverse inscription is offset, it was identified as a counterfeit, and was probably produced by Thomas Machin.

Reference: Peck 1960

Locus 33.03.010 Cat. #241 Level 3 Coin #19

Type: Halfpenny of King George III (1781)

Obverse inscription: GEORGIVS.III.REX

Obverse type: The bust of the King, laureated and cuirassed, facing right. This coin was well struck and is still in excellent condition.

Reverse inscription: HIBERNIA

Reverse type: The Irish harp surmounted by the English crown.

Historical notes: The entire series of "Hibernia" coinage proved to be unpopular in Ireland (note reverse type) and so large numbers were sent to the American colonies. The coin was originally struck at the London Mint for use in Ireland, but was quickly accepted in the American colonies due to the severity of the coin shortage.

Reference: Peck 1960

Locus 33.02.003 Cat. #95 Level 2 Coin #20

Type: Virginia halfpenny (1773)

Obverse inscription: GEORGIVS III DEI GRATIA

Obverse inscription translation: George III, by the grace of God (King).

Obverse type: The bust of the king, laureated and cuirassed, facing right.

Reverse inscription: VIRGI-NIA

Reverse type: The reverse depicts the coat of arms of Virginia below the date 1773.

Historical notes: The Virginia halfpenny, only issued in 1773, was struck at the London Mint in 22 different varieties.

Reference: Bowers 1979:115

Locus: 33.02.016 Cat. #620 Level 1 Coin #21

Type: New Jersey Copper (1786)

Obverse inscription: NOVA CAESAREA

Obverse type: A horse's head placed upon a wreath beneath which is a plow. In the exerque, the date 1786.

Reverse inscription: *E*PLURIBUS*UNUM*

Reverse type: The shield of the United States of America.

Historical notes: The coppers of Colonial New Jersey are of a single type but with many varieties. In 1786, Walter Mould, Thomas Goadsby, and Albion Cox were authorized by the New Jersey Colonial Legislature to strike coppers. Mould issued his coins at Morristown, while Cox (and possibly Goadsby) struck their coins at Rahway. Coins were also issued at Elizabeth and Newburgh, New York. They were issued only during the years 1786, 1787, and 1788.

Locus 33.03.009 Cat. #120 Level 1 Coin #22

Type: New York Copper (1787)

Obverse inscription: NOVA EBORAC·

Obverse type: Crude imitation of a British halfpenny. Bust laureated and cuirassed, facing to the right.

Reverse inscription: *VIRT.ET.LIB.*

Reverse type: Crude imitation of seated Britannia.

Historical notes: No legal coinage was issued for the State of New York after the Revolution; however, in 1787 Thomas Machin established an illegal mint in Newburgh. At this mint, called "Machin's Mills", large numbers of the Nova Eborac Coppers and counterfeits of British halfpennies were issued.

Reference: Yeoman 1980

Locus 21.02.014 Cat. #8207 Level 1 Coin #23

Type: Vermont Copper (1785-1787)

Obverse inscription: (VER)MON.(AUCTORI)

Obverse type: Bust laureated and possibly curiassed, facing to the right.

Reverse inscription: Unknown, blank

Reverse type: Unknown Historical notes: The State of Vermont granted Rueben Harmon permission to issue coppers between the years 1785 and 1788. His mint was located in the town of Rupert, along the stream known as "Millbrook". In all, Harmon issued 11 different types of coppers.

Reference: Yeoman 1980

Locus 33.04.031 Cat. #498 Level 1 Coin #24

Type: Vermont Copper (1786)

Obverse inscription: AUCTORI:VERM(O)N:

Obverse type: "Baby head", laureated and draped, facing to the left.

Reverse inscription: INDE ET LIB

Reverse type: Liberty seated, facing left, with olive branch and staff. This coin is identified as variety #311 by S. Crosby.

Historical notes: This coin was also issued by Reuben Harmon at the mint in Rupert.

Reference: Yeoman 1980

Locus 20.06.004 Cat. #5333 Level 2 Coin #25

Type: Connecticut Copper (1785-1788)

Obverse inscription: (AUCTORI CONNEC)

Obverse type: Blank

Reverse inscription: (INDE) ET LIB.

Reverse type: Seated Liberty (obscure)

Historical notes: The State of Connecticut granted Sameul Bishop, Joseph Hopkins, James Hillhouse, and John Goodrich authority to strike coppers in 1785. Their mint was located in New Haven; however, most of the coppers were struck under a sub-contract to Samuel Broome and Jeremiah Platt, both of New York.

Reference: Yeoman 1980

Locus 33.02.013 Cat. #131 Level 1 Coin #26

Type: Connecticut Copper (1787)

Obverse inscription: AUCTORI:**CONNEC.*

Obverse type: A bust, laureated and draped, facing to the left.

Reverse inscription: *INDE:** *ET LIB:

Reverse type: Liberty seated facing left; an olive branch is extended in her right hand while a staff is held in her left.

Historical note: This variety is identified as #29 by S. Crosby (see Historical notes, coin #25).

Reference: Crosby 1974

Locus 33.03.010 Cat. #130 Level 3 Coin #27

Type: Connecticut Copper (1785-1788)

Obverse inscription: AUCTORI CONNEC:*

Obverse type: A bust, laureated and draped, facing to the left.

Reverse inscription: *INDE:** *ET LIB:

Reverse type: Liberty seated, facing left; an olive branch is extended in her right hand while a staff is held in her left.

Historical notes: This variety is identified as #29 by S. Crosby (see Historical notes, coin #25).

Reference: Crosby 1974

Locus 33.03.010 Cat. #130 Level 3 Coin #27

Type: Connecticut Copper (1785-1788)

Obverse inscription: AUCTORI CONNEC:

Obverse type: A bust, laureated and draped, facing left.

Reverse inscriptions: IN(DE) ET LIB:

Reverse type: Seated Liberty (as coin #26).

Historical notes: (see Historical notes, coin #25)

Reference: Crosby 1974

Locus 33.03.001 Cat. #132 Level 0 Coin #28

Type: Colonial Copper (1785-1788)

Obverse inscription: Unknown, blank

Obverse type: Unknown

Reverse inscription: Unknown

Reverse type: Seated Liberty (obscure)

Reference: Crosby 1974

Locus 33.02.020.1 Cat. #632 Level 1 Coin #29

Type: Colonial Copper (1785-1788)

Obverse inscription: Unknown

Obverse type: Bust, laureated, facing right.

Reverse inscription: Unknown, blank

Reverse type: Unknown, blank

Reference: Crosby 1974

Locus 23.03.002 Cat. #636 Level 1 Coin #30

Type: Probable Colonial Copper (1785-1788)

Obverse inscription: Unknown, blank

Observe type: Unknown, blank

Reverse inscription: Unknown, blank

Reverse type: Unknown, blank

Reference: Crosby 1974

Locus 23.04.028 Cat. #409 Level 1 Coin #31

Type: 10 Reis (Bronze, 1748)

Obverse inscription: (.DEI).GRATIA (IO)ANNE(S.V.)

Obverse inscription: By the grace of God Joao (is) King

Obverse type: The Royal Portugese Coat of Arms, surmounted by a crown.

Reverse inscription: (ALGARBI)ORUM.REX(*)PORTUGALI.AE.ET

Reverse type: The Roman number X with a rose to each side. The date, 1748, is located below the X; the coin is surrounded by a laurel wreath.

Historical notes: The coin was struck during the reign of Dom Joao (9/12/1706 to 31/7/1750).

Reference: Ferraro Vaz 1970

Locus 33.06.002 Cat. #589 Level 1 Coin #32

Type: 5 cent piece (Bronze, 1828)

Obverse inscription: CHARLES (X ROI)DE FRANCE

Obverse type: The bust of the King, laureated and draped, facing to the left.

Reverse inscription: COLONIES FRANCAISES A 1828

Reverse type: 5 CENT surrounded by a laurel wreath , the date 1828, below. The letter "A" is to the left of the date, whole anchor is to the right.

Historic notes: The coin was struck at the Paris Mint for the colony of French Guiana during the reign of Charles X.

Reference: Gadaury and Cousenie 1979

Locus 32.02.003 Cat. #435 Level 1 Coin #33

Type: 1 Escudo (gold, 1700-1724)

Obverse inscription: None

Obverse type: The Royal Spanish Coat of Arms

Reverse inscription: None

Reverse type: The Spanish Cross

Historical notes: The coin was issued during the reign of King Philip V (1700 to 1724). Due to the crude nature of the coin, it is impossible to determine its mint of origin; however, it was probably either Lima or Mexico City.

Reference: Castan and Cayon 1978

Locus 20.02.012 Cat. #5348 Level 1 Coin #34

Type: Capped Liberty Half Eagle (1799)

Obverse inscription: LIBERTY

Obverse Type: Capped bust of Liberty facing to the right with the inscription (LIBERTY) above and to the right while the date is below. 13 stars surround the bust, 5 to the right of the inscription and 8 to the left.

Reverse type: Heraldic Eagle surrounded by the inscription.

Historical notes: Approved by an act of Congress, the Capped Liberty Half Eagle gold piece was first issued in 1795. This coin type was the first gold issue struck in the United States.

Reference: Yeoman 1980

Locus 33.04.001 Cat. #265 Level 1 Coin #35

Type: Half Dime, Draped Bust, Small Eagle Reverse (1796-1797)

Obverse inscription: (LI)BERTY

Obverse type: A small draped bust of Liberty facing to the right surrounded by 13, 15, or 16 stars and the inscription. The date is located below the bust.

Reverse inscripition: UNIT(ED STATES OF) AM(ERICA)

Reverse type: A small eagle surrounded by a wreath which in turn is surrounded by the inscription.

Historical notes: This type of half dime was only issued during 1796 and 1797, and was struck only at the Philadelphia Mint.

Reference: Yeoman 1980

Locus 20.05.006 Cat. #5287 Level 1 Coin #36

Type: Nickel, Five-cent Piece, Shield Type (1867-1883)

Obverse inscription: (IN GOD WE TRUST)

Obverse type: Shield with the motto above and the date below (very obscure).

Reverse inscription: (UNITE)D (STATES OF AMERICA.CENTS.)

Reverse type: The number "5" (in the center) surrounded by 13 stars which in turn is surrounded by the inscription (only 5 of the 13 stars are visible).

Historical notes: This coin type was designed by James B. Longacre and was issued at the Philadelphia Mint.

Reference: Yeoman 1980.

Locus 21.04.001 Cat. #8003 Level 1 Coin #37

Type: Nickel, Five-cent Piece, Liberty Head Type (1890)

Obverse inscription: None

Obverse type: The bust of Liberty facing to the left surrounded by 13 stars; the date (1890) is located below.

Reverse inscription: UNIT(ED STATES OF AMERICA).CENTS.

Reverse type: Roman V surrounded by a wreath above the motto E.PLURIBUS. UNUM. The wreath and motto in turn is surrounded by the reverse inscription (very obscure).

Historical notes: This coin type was designed by Charles E. Barber and was struck at the Philadelphia, Denver, and San Francisco mints.

Reference: Yeoman 1980

Locus 33.07.004 Cat. #153 Level 2 Coin #38

Type: Two-cent Piece (1864)

Obverse inscription: (IN GOD WE TRUST)

Obverse type: Shield with motto above and the date (1864) below.

Reverse inscription: 2 cents surrounded by a wreath which in turn is surrounded by the inscription.

Historical notes: The two-cent piece is one of the shortest lived issues of United States coinage. It was on this coin that the motto "IN GOD WE TRUST" first appeared. The presence of the motto is a reflection of the renewed religious sentiment that occurred both during and after the Civil War.

Reference: Yeoman 1980

Locus 22.02.002 Cat. #5127 Level 1 Coin #39

Type: Large cent, Flowing Hair, Wreath Reverse (1793)

Obverse inscription: (LIBE)RTY

Obverse type: The bust of Liberty with flowing hair, facing to the right.

Reverse type: ONE CENT (visible) surrounded by a wreath, which in turn is surrounded by the reverse inscription.

Historical notes: This coin type was issued only in the year 1793 and its production was abandoned after a period of 3 months.

Reference: Yeoman 1980

Locus 33.03.005 Cat. #244 Level 2 Coin #40

Type: Large cent, Coronet type (1816-1857), Matron Head (1818)

Obverse inscription: None

Obverse type: The bust of Liberty facing to the left surrounded by 13 stars, with the date (1818) located below.

Reverse inscription: UNITED STATES OF AMERICA, surrounding ONE CENT.

Reverse type: The inscription ONE CENT surrounded by a wreath, which in turn is surrounded by the reverse inscription. The reverse of this coin is in very good condition.

Historical notes: This coin type was designed by Robert Scot.

Reference: Yeoman 1980

Locus 36.01.006 Cat. #5094 Level 1 Coin #41

Type: Large cent, Coronet Type, Matron Head (1816-1835)

Obverse inscription: None

Obverse type: Blank, a faint trace of a bust facing to the left.

Reverse inscription: (UNITED STATES OF AMERICA) surrounding ONE CENT.

Reverse type: The inscription ONE CENT surrounded by a wreath which in turn is surrounded by the reverse inscription. Only the wreath and the inscription ONE CENT is visible.

Historical notes: This coin type was designed by Robert Scot.

Reference: Yeoman 1980

Locus 33.03.002 Cat. #15 Level 1 Coin #42

Type: Small cent, Indian Head Type (1859)

Obverse inscription: UNITED STATES OF AMERICA

Obverse type: The bust of an Indian girl facing to the left surrounded by the obverse inscription. The date (1859) is located below the bust.

Reverse inscription: ONE CENT

Reverse type: ONE CENT, within wreath.

Historical notes: The Flying Eagle small cent (1856-1859) was redesigned in 1859 and the Indian Head type was chosen as the new obverse motif. The reverse type was also changed; the wreath of corn, cotton, wheat, and tobacco that dominated the reverse of the Flying Eagle cent became a simple laurel wreath. In 1860, however, this reverse type was modified to display an oak wreath with a small shield at the top. The weight (4.67 grams) and composition (88% copper, 12% nickel) did not change. This coin type was designed by James B. Longacre, and was struck at the Philadelphia Mint.

Reference: Yeoman 1980

Locus 33.05.003 Cat. #106 Level 2 Coin #43

Type: Small Cent, Indian Head Type (1859)

Obverse inscription: UNITED STATES OF AMERICA

Obverse type: As coin #42

Reverse inscription: ONE CENT

Reverse type: As coin #42

Historical notes: See Historical notes, coin #41.

Reference: Yeoman 1980

Locus 33.02.007 Cat. #64 Level 1 Coin #44

Type: Small cent, Indian Head Type, Copper/Nickel, Oak wreath with Shield (1863)

Obverse inscription: UNITED STATES OF AMERICA

Obverse type: The bust of an Indian girl facing to the left, surrounded by the obverse inscription, with the date (1863) located below the bust.

Reverse inscription: ONE CENT

Reverse type: ONE CENT within an oak wreath, a shield located above.

Historical notes: see Historical notes, coin #42.

Reference: Yeoman 1980

Locus 33.02.007 Cat. #64 Level 1 Coin #45

Type: Small Cent, Indian Head Type, Copper/Nickel, Oak wreath with shield (1963)

Obverse inscription: UNITED STATES OF AMERICA

Obverse type: As coin #44

Reverse inscription: ONE CENT

Reverse type: As coin #44

Historical notes: See Historical notes, coin #42

Reference: Yeoman 1980.

Locus 33.05.015 Cat. #245 Level 2 Coin #46

Type: Small Cent, Indian Head Type, Bronze, Oak wreath with shield (1865)

Obverse inscription: UNITED STATES OF AMERICA

Obverse type: As coin #44 except for the date (1865).

Reverse inscription: ONE CENT

Reverse type: As coin #44

Historical notes: During the year 1864, the alloy of the cent was changed to 95% copper and 5% tin and/or zinc. The weight of the new coin was reduced to 4.19 grams, resulting in a thinner coin. The new Indian Head was struck at both the Philadelphia and San Francisco mints.

Locus 36.01.001 Cat. #5038 Level 0 Coin #47

Type: Small Cent, Indian Head Type, Bronze, Oak wreath with shield (1864-1909)

Obverse inscription: (UNITED STATES OF AMERICA)

Obverse type: Blank

Reverse inscription: As coin #44

Historical notes: (See Historical notes, coin #'s 42 and 45.)

Reference: Yeoman 1980

Locus 18.03.005 Cat. #8234 Level 1 Coin #48

Type: Chinese Cash, 19th/20th century, 26 mm

Obverse type: Obscure Chinese characters around a square hole in the center of the coin.

Reverse: Obscure Chinese characters around a square hole in the center of the coin.

Historical notes: Mid-19th century to early-20th century bronze Chinese coin.

Reference: Doty 1978

Locus 33.05.032 Cat. #397 Level 2 Coin #49

Type: Large Copper Coin, 29 mm

Obverse type: Blank

Reverse type: Blank

Locus 21.03.006 Cat. #8187 Level 2 Coin #50

Type: Large Copper Coin, 27 mm

Obverse type: Blank

Reverse type: Possible wreath?

Locus: 21.01.002 Cat. #8098 Level 6 Coin #51

Type: Large Copper Coin, 27 mm

Obverse type: Blank

Reverse type: Blank

Locus 23.04.058 Cat. #580 Level 1 Coin #52

Type: Large Copper Coin, 28 mm.

Obverse type: Blank

Reverse type: Blank

Locus 33.04.033 Cat. #518 Level 1 Coin #53

Type: Large Copper coin, 28 mm

Obverse type: Blank

Reverse type: Blank

Locus 19.01.020 Cat. 5201 Level 1 Coin #54

Type: Large Copper Coin, 34 mm

Obverse type: Blank, severe oxidation

Reverse type: Blank, severe oxidation

Locus 23.05.005 Cat. #217 Level 1 Coin #55

Type: Large Copper Coin, 30 mm

Obverse type: Blank, severe oxidation

Reverse type: Blank, severe oxidation

Locus 22.02.002 Cat. #2131 Level 1 Coin #56

Type: Large Copper Coin, 28 mm

Obverse type: Blank, severe oxidation

Reverse type: Blank, severe oxidation

Locus 21.01.008 Cat. #8068 level 1 Coin #57

Type: Large Copper Coin, 26 mm

Obverse type: Blank, severe oxidation

Reverse type: Blank, severe oxidation

Locus 33.01.024 Cat. #546 Level 1 Coin #58

Type: Large Copper Coin, 28 mm

Obverse type: Blank

Reverse type: Blank

Locus 33.04.033 Cat. #518 Level 1 Coin #59

Type: Possible German Jetton, hammer struck, pre- to early-17th century, 25 mm.

Obverse type: Blank, pitted from oxidation

Reverse type: Trace of a Royal Crest, pitted from oxidation

Reference: Noel Hume 1980:171-173

Locus: 23.04.059 Cat. #609 Level 1 Coin #60

Type: Possible English Naval Medallion, early-18th century

Obverse type: Trace of a bust, severe oxidation

Reverse type: Blank, severe oxidation

Reference: Doty 1982: Personal communication.

Addendum: In addition to the coins noted above, and subsequent to the preparation of this section, four coins were recovered during artifact washing. One, a British halfpenny from the ship fill, was a King George II type, one was an unspecified coin from Feature 1, and two were unspecified coins from the yard fill. Of these coins, on which no additional research has been done, only the halfpenny has been included in the text. (Editor).

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FAUNA
(Joan H. Geismar)

The faunal report presented here is intended as a guide rather than a definitive statement. A brief discussion focuses on several major domesticates and one wild animal species from primary, or original, landfill and all features from the 175 Water Street site. In addition, a detailed report on major domesticates from selected features is also presented. These data suggest the kinds of information available from this faunal collection; this includes information about diet, species availability and utilization, and husbandry practices as they are reflected in the fauna from a major urban fill site.

The site's fauna were organized and tabulated in several ways. Shell material, mainly oyster and clam, was weighed in the field; this information was later transferred to the computer data file by Steven Gross. Bone material from features was identified in the lab by several analysts and classified as mammal, bird, or reptile. Among the analysts were Dr. Kathleen Biddick, who analyzed and reported on the major domesticates from selected features (see below), and Edwina Gluck, who identified all feature bird and some feature mammal material, and tabulated fish from selected features. Thomas Amorosi and Eugene Boesch identified the mammal assemblage from the ship fill. This material represents the major non-feature mammal sample from the site. Reptile and small mammal bones from features were also identified and tabulated by Thomas Amorosi. In addition, four human bone fragments from ship fill were identified by Bobbi Brickman; these identifications were later corroborated by Dr. Harry Schapiro of the American Museum of Natural History. And, finally, weights for non-feature bone material from the yard excavations were tabulated by Patricia Seabury. This left only the non-mammal fauna from the ship fill untabulated in some form.

Subsequent to Dr. Kathleen Biddick's analysis of major domesticates from selected features--an analysis completed early in the laboratory phase of the project--several feature components were reorganized. Consequently, some of the sample-sizes in this analysis might now be subject to revision. For example, of the 347 domesticates in the combined sample from Features 42, 43, and 46, forty-one, or 12%, would now be removed. On the other hand, Feature 41, an important analytic unit, would remain virtually unchanged, as would the major findings in the report. This applies to findings on predominant species, disposal patterns, sample ages, and seasonal patterning. Without question, Dr. Biddick's analytic methods provide a model for future research. It is believed that her report, which is presented in its entirety, is among, if not the first faunal report of its kind from a large American urban site. (Note: Updated counts and percentages on selected domesticates will be found in Faunal Table 4.43).

In addition to the report on major domesticates from selected features, the data presented here allowed for comparison of the fauna from all features. They also permitted comparisons to be made between fauna from occupation levels of features and primary, or original, landfill represented by the Ronson Ship fill, the "9" levels from features, and two deeptests (see Landfill, Chapter 5).

All but two features--a brick platform (F10) and a wood floor (F11) in Lot 33--provided faunal material. Of the 19,373 bone fragments comprising the site's bird (ZB), mammal (ZM), and reptile (ZR) assemblages, 16,414, or 84.7%, were mammal (see Faunal Table 4.42). This includes food domesticates such as cow, sheep, goat, and pig, as well as nonfood domesticates such as cat and dog, and wild species such as rat.

The largest faunal assemblage from the occupation levels of a feature (12% of the site's fauna) was recovered from Feature 34, the "pit" in Lot 23. Of this assemblage, 94.4% was mammal bone (Faunal Table 4.42). The second highest faunal percentage (10%) came from Feature 41, the privy, in Lot 22; again, mammal bones (79.3%) predominated.

No obvious pattern emerges from the faunal data to suggest that certain feature types are more likely than others to contain heavy bone concentrations. For example, while privies generally produced the most faunal material, as noted above, the site's highest concentration came not from a privy, but from a "pit" feature. In addition, some of the lower faunal percentages also came from privies (for example, see Faunal Table 4.42, Features 32, 42, and 44).

Faunal Table 4.43 lists numbers and percentages of selected mammals, specifically major food domesticates, horse, and rat. (These data pertain only to firmly identified species and do not include such categories as cattle/horse or sheep/goat/dog "size" bones, a significant portion of the faunal collection.) This information allows for the comparison of the incidence of these species between features. For example, food domesticates from Feature 34, the "pit", are predominantly cattle (Bos) (42.6%) followed by sheep/goat (Ovis/Capra) (31.6%). The pig (Sus) assemblage, at 25.9%, is the third highest bone percentage from this feature. However, the sample from Feature 41, a privy, indicates a different distribution. Here identified cattle and sheep/goat are almost equally represented (43.8% cattle and 46.1% combined sheep/goat) while pig, representing 5.2% of the sample, is only a weak third.

Since late-eighteenth to early-nineteenth-century date ranges appear likely for both Features 34 and 41 (see Glass and Ceramic Table 4.17), a chronological variability does not provide a simple reason for these differences. However, it appears that Feature 34 may represent a single or short term warm weather deposit (see Landfill, Chapter 5) while the privy fauna undoubtedly represent a longer, cross-seasonal deposition. Here then, we may be seeing the seasonal difference noted in the report on selected major domesticates from features (see below).

A variability is therefore suggested in the patterning from the occupation levels of features from the 175 Water Street site. Not only is this true of food domesticates, but also of wild, perhaps post-occupation, rat populations at the site.

The highest feature percentage of rat bones (Rattus sp) was recovered from the occupation levels of Feature 1, a cistern in Lot 36. Here 80.5% of the fauna was rat. Rat bones were also relatively heavily represented in a privy in Lot 18 (70.2%) and in the deeptest in Lot 30 (F55) where rat (2 bones) was the only species of the six possible varieties in the sample.

Faunal Table 4.42 175 WATER STREET: Number and Percent of Feature Bird, Mammal, and Reptile

Lot Number	Feature Description	Feature Number	Levels	(ZB) Bird		(ZM) Mammal		(ZR) Reptile		Feature Totals	
				#	%	#	%	#	%	#	%
36	cistern	1	1,2	15(	4.1)	349(	95.9)	-		364(	1.9)
			9	5(	17.9)	23(	82.1)	-		28(	0.1)
33	privy	2	1,2	84(	11.9)	605(	86.1)	14(	2.0)	703(	3.6)
			9	22(	20.2)	86(	78.9)	1(	0.9)	109(	0.6)
	barrel-cistern	3	1,2	91(	12.8)	600(	84.4)	20(	2.8)	711(	3.7)
			9	68(	23.4)	219(	75.5)	3(	1.0)	290(	1.5)
	cistern	4	1,2,3	62(	7.8)	725(	91.0)	10(	1.3)	797(	4.1)
	builders' trench	5	1	56(	17.3)	256(	79.3)	11(	3.4)	323(	1.7)
	builders' trench	6	1	1(	11.1)	8(	88.9)	-		9(	0.0)
	barrel	7	1		-	1(	100.0)	-		1(	0.0)
	wooden floor	8	1	3(	3.7)	79(	96.3)	-		82(	0.4)
	soil below F8	9	1		-	35(	100.0)	-		35(	0.2)
	wooden floor	12	1		-	3(	100.0)	-		3(	0.0)
	metal from F12	13	1		-	2(	100.0)	-		2(	0.0)
	builders' trench	14	1	45(	23.7)	142(	74.7)	3(	1.6)	190(	1.0)
	builders' trench	15	1	2(	14.3)	12(	85.7)	-		14(	0.1)
	brick floor	16	1	2(	6.7)	28(	93.3)	-		30(	0.2)
	wall segments	17 18 26	1	152(	13.4)	973(	85.6)	12(	1.1)	1137(	5.9)
	brick platform	19	1	26(	23.2)	86(	76.8)	-		112(	0.6)
	"flower box"(?)	20	1	16(	24.6)	49(	75.4)	-		65(	0.3)
	builders' trench	21	1	3(	20.0)	12(	80.0)	-		15(	0.1)
	builders' trench	22	1	6(	25.0)	18(	75.0)	-		24(	0.1)
	stone stoop (?)	23	1	2(	5.1)	37(	94.9)	-		39(	0.2)
	builders' trench	24	1	3(	3.7)	79(	96.3)	-		82(	0.4)
	builders' trench	25	1	83(	16.9)	404(	82.4)	3(	0.6)	490(	2.5)
	living surface	27	1	178(	13.3)	1154(	86.2)	6(	0.4)	1338(	6.9)
	orange soil	28	1	115(	26.5)	314(	72.4)	5(	1.2)	434(	2.2)
	builders' trench	29	1	1(	6.3)	15(	93.8)	-		16(	0.1)
32	box	30	1,2,3,4	83(	23.0)	252(	69.8)	26(	7.2)	361(	1.5)
30	barrel	31	1,2	69(	25.6)	166(	61.5)	35(	13.0)	270(	1.4)
23	privy	32	1,2,3,4	8(	7.5)	99(	92.5)	-		107(	0.6)
	unid. feature	33	1	21(	8.3)	233(	91.7)	-		254(	1.3)

Faunal Table 4.42 175 WATER STREET (continued)

Lot Number	Feature Description	Feature Number	Levels	(ZB) Bird #	(ZB) Bird %	(ZM) Mammal #	(ZM) Mammal %	(ZR) Reptile #	(ZR) Reptile %	Feature Totals #	Feature Totals %
	"pit"	34	1,2,3,4,5	83	3.6	2246	96.4	-		2329	12.0
	box	35	1,2	1	1.2	80	95.2	3	3.6	84	0.4
	box	36	1,2	93	14.3	556	85.7	-		649	3.4
	barrel	37	1	7	10.8	58	89.2	-		65	0.3
	cistern base	38	1,2	3	4.5	64	95.5	-		67	0.3
	builders' trench	39	1	4	14.8	23	85.2	-		27	0.1
	unid. feature	40	1,2,3	11	7.6	133	92.4	-		144	0.7
22	privy	41	1,2	364	18.7	1540	79.3	39	2.0	1943	10.0
			9	10	15.4	53	81.5	2	3.1	65	0.3
21	privy	42	1,2	22	11.3	173	88.7	-		195	1.0
			9	40	16.3	204	82.9	2	0.8	246	1.3
	privy	43	1,2,3	138	13.0	921	86.6	4	0.4	1063	5.5
			9	4	6.7	55	91.7	1	1.7	60	0.3
	privy	44	1	13	10.7	109	89.3	-		122	0.6
			9	-		9	100.0	-		9	0.0
	drain	45	1	-		7	100.0	-		7	0.0
	drain	46	1	34	25.6	98	73.7	1	0.8	133	0.7
20	privy	47	1,2,3	8	17.4	38	82.6	-		46	0.2
	privy	48	1,2	50	13.7	302	82.5	14	3.8	366	1.9
			9	1	5.3	18	94.7	-		19	0.1
	box/cofferdam	49	1,2,3	117	16.1	561	77.3	48	6.6	726	3.7
			9	-		12	100.0	-		12	0.1
19	privy	50	1	100	21.6	362	78.0	2	0.4	464	2.4
			9	1	3.3	29	96.7	-		30	0.2
18	privy	51	1,2	220	24.7	665	74.8	4	0.4	889	4.6
			9	-		44	100.0	-		44	0.2
	box	52	1,2	40	40.8	57	58.2	1	1.0	98	0.5
			9	2	15.4	11	84.6	-		13	0.1
	unid. feature	53	1	4	16.0	20	80.0	1	4.0	25	0.1
	cistern base	54	1,2	10	15.9	53	84.1	-		63	0.3
30	deeptest	55	1,2,3,4	-		366	98.4	6	1.6	372	1.9
29	deeptest	56	1,2,3,4	-		294	93.9	19	6.1	313	1.6
33	barrel	57	1	54	22.0	187	76.0	5	2.0	246	1.3
			9	2	50.0	2	50.0	-		4	0.0
Variable Totals				2658	13.7	16414	84.7	301	1.6	19373	

Faunal Table 4.43 175 WATER STREET: Number and Percent of Selected Mammals by Feature

Lot Number	Feature Description	Feature Number	Levels	Cattle (ZM01)	Sheep/ Goat (ZM02)	Sheep (ZM03)	Pig (ZM05)	Horse (ZM06)	Rat (ZM90)*	Feature Totals
				# %	# %	# %	# %	# %	# %	# %
36	cistern	1	1,2	15(5.5)	27(9.9)	-	11(4.0)	-	219(80.5)	272(6.9)
			9	4(28.6)	8(57.1)	-	1(7.1)	-	1(7.1)	14(0.4)
33	privy	2	1,2	61(19.9)	60(19.5)	-	25(8.1)	-	161(52.4)	307(7.8)
			9	20(52.6)	13(34.2)	-	5(13.2)	-	-	38(1.0)
	barrel/cistern	3	1,2	42(26.1)	-	63(39.1)	43(26.7)	-	13(8.1)	161(4.1)
			9	35(31.0)	-	57(50.4)	18(15.9)	-	3(2.7)	113(2.9)
	stone cistern	4	1,2,3	75(55.6)	-	39(28.9)	20(14.8)	-	1(0.7)	135(3.4)
	builders' trench	5	1	9(12.7)	-	32(45.1)	21(29.6)	-	9(12.7)	71(1.8)
	builders' trench	6	1	2(100.0)	-	-	-	-	-	2(0.1)
	wooden floor	8	1	7(43.8)	-	3(18.8)	1(6.3)	-	5(31.3)	16(0.4)
	soil below F8	9	1	1(11.1)	-	3(33.3)	5(55.6)	-	-	9(0.2)
	builders' trench	14	1	5(18.5)	11(40.7)	3(11.1)	3(11.1)	-	5(18.5)	27(0.7)
	builders' trench	15	1	-	-	3(75.0)	1(25.0)	-	-	4(0.1)
	brick floor	16	1	-	-	4(100.0)	-	-	-	4(0.1)
	wall segments	17,18,26	1	52(31.9)	-	66(40.5)	34(20.9)	-	11(6.7)	163(4.1)
	brick platform	19	1	4(30.8)	-	8(61.5)	-	-	1(7.7)	13(0.3)
	"flower box"	20	1	-	-	1(11.1)	7(77.8)	-	1(11.1)	9(0.2)
	builders' trench	21	1	-	-	-	1(100.0)	-	-	1(0.0)
	builders' trench	22	1	-	-	1(50.0)	1(50.0)	-	-	2(0.1)
	stone stoop(?)	23	1	2(25.0)	-	4(50.0)	1(12.5)	-	1(12.5)	8(0.2)
	builders' trench	24	1	1(20.0)	-	2(40.0)	2(40.0)	-	-	5(0.1)
	builders' trench	25	1	18(16.7)	-	25(23.1)	20(18.5)	-	45(41.7)	108(2.7)
	grey deposit	27	1	41(22.8)	89(49.4)	-	14(7.8)	-	36(20.0)	180(4.6)

(continued)

Faunal Table 4.43 (continued)

Lot Number	Feature Description	Feature Number	Levels	Cattle (ZM01)	Sheep/ Goat (ZM02)	Sheep (ZM03)	Pig (ZM05)	Horse (ZM06)	Rat (ZM90)*	Feature Totals
				# %	# %	# %	# %	# %	# %	# %
33	orange deposit	28	1	38(36.9)	47(45.6)	1(1.0)	13(12.6)	-	4(3.9)	103(2.6)
	builders' trench	29	1	2(50.0)	-	1(25.0)	1(25.0)	-	-	4(0.1)
32	box	30	1,2,3,4	23(30.1)	1(1.4)	32(43.2)	10(13.5)	-	8(10.8)	74(1.9)
30	barrel	31	1	23(54.8)	1(2.4)	11(26.2)	7(16.7)	-	-	42(1.1)
23	privy	32	1,2,3,4	19(48.7)	18(45.2)	-	2(5.1)	-	-	39(1.0)
	pit	34	1,2,3,4	23(42.6)	-	17(31.5)	14(25.9)	-	-	54(1.4)
	box	35	1,2	6(46.2)	-	5(38.5)	2(15.4)	-	-	13(0.3)
	box	36	1,2	2(25.0)	-	1(12.5)	5(62.5)	-	-	8(0.2)
23	barrel	37	1	6(17.6)	-	11(32.4)	3(8.8)	-	14(41.2)	34(0.9)
	cistern base	38	1	2(100.0)	-	-	-	-	-	2(0.1)
	trench	39	1	-	-	-	1(50.0)	-	1(50.0)	2(0.1)
	unid. feature	40	1,2,3	6(37.5)	-	7(43.8)	-	-	3(18.8)	16(0.4)
22	privy	41	1,2	319(43.7)	334(45.8)	2(0.3)	38(5.2)	-	37(5.1)	730(18.5)
			9	2(18.2)	3(27.3)	-	2(18.2)	-	4(36.4)	11(0.3)
21	privy	42	1,2	12(34.3)	16(45.7)	-	4(11.4)	-	3(8.6)	35(0.9)
			9	40(46.0)	24(27.6)	-	19(21.8)	-	4(4.6)	87(2.2)
	privy	43	1,2,3	71(39.2)	43(23.8)	-	42(23.2)	-	25(13.8)	181(4.6)
			9	10(41.7)	9(37.5)	-	5(20.8)	-	-	24(0.6)
	privy	44	1	7(33.3)	6(28.6)	-	6(28.6)	-	2(9.5)	21(0.5)
			9	-	-	-	1(100.0)	-	-	1(0.0)
	drain	45	1	-	2(100.0)	-	-	-	-	2(0.1)
	drain	46	1	5(27.8)	7(38.9)	-	6(33.3)	-	-	18(0.5)
20	privy	47	1,2,3	1(25.0)	1(25.0)	-	2(50.0)	-	-	4(0.1)

(continued)

Faunal Table 4.43 (continued)

Lot Number	Feature Description	Feature Number	Levels	Cattle (ZM01)	Sheep/ Goat (ZM02)	Sheep (ZM03)	Pig (ZM05)	Horse (ZM06)	Rat (ZM90)*	Feature Totals
				# %	# %	# %	# %	# %	# %	# %
20	privy	48	1,2	28(31.5)	41(46.1)	1(1.1)	14(15.7)	-	5(5.6)	89(2.3)
			9	-	2(100.0)	-	-	-	-	2(0.1)
	box	49	1,2,3	96(41.7)	84(36.5)	-	47(20.4)	-	3(1.3)	230(5.8)
			9	-	-	-	2(100.0)	-	-	2(0.1)
19	privy	50	1	36(33.0)	33(30.3)	-	22(20.2)	-	18(16.5)	109(2.8)
			9	-	1(50.0)	-	1(50.0)	-	-	2(0.1)
18	privy	51	1	25(9.8)	45(17.6)	-	6(2.4)	-	179(70.2)	255(6.4)
	box	52	1,2	2(12.5)	-	9(56.3)	5(31.3)	-	-	16(0.4)
			9	3(60.0)	-	2(40.0)	-	-	-	5(0.1)
	unid. feature	53	1	3(50.0)	-	-	3(50.0)	-	-	6(0.2)
	cistern base	54	1,2	5(35.7)	-	8(57.1)	1(7.1)	-	-	14(0.4)
30	deeptest	55	2	-	-	-	-	-	2(100.0)	2(0.1)
33	barrel	57	1	30(56.6)	-	11(20.8)	8(15.1)	-	4(7.5)	53(1.3)
			9	-	-	2(100.0)	-	-	-	2(0.1)
	TOTALS			1239(31.3)	926(25.4)	435(11.0)	526 (13.3)	-	828(20.9)	3954

*ZM90 is a combined group consisting of Rattus (sp) (ZM21, Rattus rattus (ZM22), and Rattus norvegicus (ZM23).

A statistical testing of the data found in Faunal Table 4.43 might reveal a subtle patterning on the feature level otherwise not readily detected. However, chi-square tests on selected features presented in the report on major domesticates (see bleow) did not reveal strong patterning; these tests indicate that the feature variability suggested in Faunal Table 4.43 may be real.

A stonger patterning does emerge, however, from comparison of the six variables (selected domesticates and rat) as found in primary landfill represented by the "9" levels of occupation features, a deeptest (F55), and the Ronson ship fill (see Faunal Table 4.44). In addition, when the data from occupation feature levels are combined, a pattern similar to landfill levels emerges: the percentage of sheep/goat (ZM02, ZM03) is highest in all combined analytical groups followed by cattle (ZM01), and pig (ZM04). A subtle pattern of highest percentages of pig (17.9%) in "9" levels to lowest (12.9%) in occupation levels may indicate a difference in utilization or relative availability of pig over time; but this is merely a suggestion.

While similarities between landfill deposits and the occupation levels of features emerge, some differences occur even in these combined assemblages. Foremost among these is the difference in percentage of rat bones.

Faunal Table 4.44 indicates that rat was a minor factor in all the primary fill samples represented by the ship fill (0.05%) and the "9" levels of features (4.0%). (As noted above, a 100.0% sample of rat from a deeptest fill, F55, in this analyis is based on only two bones and is therefore inconclusive.) However, in the sample from the occupation levels of features, 22.3% is rat.

When all the data on selected mammals from primary fill are combined (Faunal Table 4.45), a better comparison of these variables can be made and statements about the fauna are possible. For example, horse (Equus) (ZM06), expected to be a faunal component, was represented by only two identified bones from the ship fill and is therefore almost non-accountable in the assemblage as a whole. In the combined totals for fill and occupation deposits, sheep/goat continues to predominate both in primary fill (43.6%) and in occupation levels of features (34.0%); cattle, with 39.0% from the primary fill and 30.8% from occupation deposits is second. Pig remains the third highest in both samples. The percentage of rat, however, is much higher in the feature occupation levels (22.3%) than in the primary fill (1.2%).

The high percentage of rat bones in the occupation levels of features may represent the inadvertent trapping and subsequent death of these creatures in many of the stone, brick, and wood features (Amorosi 1982: personal communication). Large samples of rat bones (179, or 70.2%) from the occupation deposits in Feature 51, a privy in Lot 18, Feature 1, a filled cistern in Lot 36 (219, or 80.5%), and Feature 2, a privy in Lot 33 (161, or 52.4%) indicate the preference of rats for these debris-filled features. On the other hand, although based on smaller numbers, relatively high percentages of rat bones were also found in more amorphous features such as builders' trenches (see Faunal Table 4.43, Features 24, 25, and 39). This may indicate an actual increase in rat populations over time, or it may represent the incidence of these creatures in abandoned features or on abandoned sites.

Faunal Table 4.44 175 WATER STREET: Cattle, Sheep/Goat, Pig, Horse, and Rat Bone Numbers and Percentages from Feature Occupation Levels and Primary Landfill Deposits from Features and the Ronson Ship

	(ZM01) Cattle		(ZM02,ZM03) Sheep/Goat		(ZM05) Pig		(ZM06) Horse		(ZM90)* Rat		Totals	
	#	%	#	%	#	%	#	%	#	%	#	%
Ship fill (primary fill)	354	(39.4)	403	(44.8)	138	(15.4)	2	(0.2)	1	(0.0)	898	(18.5)
"9" levels (primary fill)	114	(37.9)	121	(40.2)	54	(17.9)	-		12	(4.0)	301	(6.2)
Deeptest fill (primary fill)	-		-		-		-		2	(100.0)	2	(0.0)
Occupation levels (feature fill)	1125	(30.8)	1240	(34.0)	472	(12.9)	-		814	(22.3)	3651	(75.2)
Variable Totals	1593	(32.8)	1764	(36.4)	664	(13.7)	2	(0.0)	829	(17.1)	4852	(100.0)

*ZM90 is a combined group consisting of Rattus (sp?) (ZM21), Rattus rattus (ZM22), and Rattus norvegicus (ZM23).

Faunal Table 4.45 175 WATER STREET: Total Numbers and Percentages of Cattle, Sheep/Goat, Pig, Horse, and Rat Bones from Primary Landfill and Occupation Levels of Features

	(ZM01) Cattle		(ZM02,ZM03) Sheep/Goat		(ZM05) Pig		(ZM06) Horse		(ZM90)* Rat		Totals	
	#	%	#	%	#	%	#	%	#	%	#	%
Primary landfill ("9" levels, ship fill, and deeptest fill)	468	(39.0)	524	(43.6)	192	(16.0)	2	(0.0)	15	(1.2)	1201	(99.8)
Occupation levels	1125	(30.8)	1240	(34.0)	472	(12.9)	-		814	(22.3)	3651	(75.2)
Variable Totals	1593	(32.8)	1764	(36.4)	664	(13.7)	2	(0.0)	829	(17.1)	4852	(100.0)

*ZM90 is a combined group consisting of Rattus (sp?)(ZM21), Rattus rattus (ZM22), and Rattus norvegicus (ZM23).

In addition to the major domesticates analyzed here, the mammal sample from the Ronson ship fill included three human bone fragments recovered in a ballast-like matrix from between the ship's framing in Lot 33. (A fourth fragment was recovered from a similar matrix under a collapsed lot wall, but this adult mandible fragment was from an unsampled context (Cat. #2036, Locus 33.11.007) and was therefore not tabulated for the computer.) The sampled bones were identified as a premolar, or juvenile tooth (Cat. #2047), and two cranial fragments (Cat. #2038), also possibly juvenile, that fit together.

Rat has been mentioned as one non-domesticate recovered from the primary fill and more intensively from occupation levels of features. Other such species represented in the sample, but recovered in smaller numbers include raccoon (Procyon sp), weasel, (Mustela sp), rabbit (Sylvilagus sp), and squirrel (Sciurus sp). In addition, turtle appears to be a common reptile recovered from the site, and these fauna--mainly represented by carapaces or shell--may suggest a native delicacy. Box and water turtle (Emididae sp) elements were most common, followed by snapping turtle (Chelydridae sp), all of which are edible (Amorosi 1982: personal communication). References to turtle feasts attended by New York's wealthy merchants are available. One mid-eighteenth-century visitor to New York remarked on the turtle barbeques attended by the local gentry once or twice weekly (Stokes IV 1922:581). On the other hand, water and snapping turtles may merely indicate the block's initial river origins and later waterfront proximity.

Given its eighteenth-century beginnings, one species of wild fauna expected in the site assemblage was deer. In fact, however, no deer was identified in any feature level (see report on major domesticates, below) including those from the primary fill deposits in these features. The sole deer bone fragment identified from the site--a water worn mandible fragment (Odocoileus virginianus)--was recovered from below the weather deck of the Ronson ship in Lot 32. This suggests that deer was at best an insignificant part of the diet of the site's occupants. Based on the date of the earliest primary fill from the site (see Landfill, Chapter 5), it also suggests that by 1750 the diet of New Yorkers did not depend on or even include deer. It appears that, like today, domesticates, in this case predominantly sheep/goat, cattle, and pig, were the major meat resource for New York City's inhabitants.

Summary

The brief analysis presented here indicates that major domesticates, specifically sheep/goat, cattle, and pig, were important components in the diet of the 175 Water Street site occupants. Furthermore, these same domesticates were equally well represented in the landfill that predates this occupation. It should be noted that although faunal concentrations and predominant species varied from feature to feature, most faunal species recovered from the site were edible. In addition to the data presented here, bird data appear to confirm the edible nature of the 175 Water Street faunal collection (Gluck 1983: personal communication). Without question, the specifics and nuances of this collection warrant further analysis.

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AN ARCHAEOZOOLOGICAL STUDY OF THE MAJOR DOMESTICATES (PIG, SHEEP/GOAT, CATTLE) FROM THE PRIVIES AND OTHER SELECTED FEATURES AT 175 WATER STREET

(Kathleen Biddick)

Summary

A total of thirteen features was studied in a 200 hour analysis period. Identification to species was made for 2,268 pieces of bone. 11,610 bones were sorted into ranged mammal material not identifiable to species, and fish, bird, rodent, reptile and ampibian categories. A data archive for each feature was created. It includes the following information: a breakdown by catalog number of identifications and sorted frequencies; skeletal element frequencies for each of the major domesticates (pig, sheep/goat, and cattle); epiphyseal fusion record and age estimates for bone without analytic criteria for aging for the major domesticates; alteration to bone through burning, butchery, gnawing, weathering, breakage, etc. for each of the major domesticates by skeletal element.

The sample size of major domesticates varied across privies and other features. No clear cut chronological of functional pattern emerges in the amount of bone material that might be found in the features. Features with large domestic animal bone samples, regardless of type of feature, had proportionately large fish and bird samples. This suggests that a diversified pattern of disposing material was practiced, presumably reflecting diversified diets. Of the thirteen features studied, only six fell into large and medium sample categories. Sample size is important for research design, and accurate estimates of bone sample size made in the field are necessary both for designing sampling strategies for analysis and for allocating laboratory time for washing, etc.

The mean proportional representation of the major domesticates across features studied breaks down as follows:

Pig	x 15.0%	+	6.4%
Sheep/ Goat	x 42.6%	+	8.2%
Cattle	x 42.3%	+	7.9%

The skeletal composition for each of these species varied significantly. The proportional representation of skeletal elements has been plotted. Pigs are characterized by an even representation of elements in the skeleton. For both sheep/goat and cattle, vertebra and ribs comprise the proportionately largest part of the sample. Since vertebra are important in urban samples and are time consuming to identify (in fact they are often not analyzed), a causal model for predicting the frequencies for lumbar vertebra was devised and tested by path analysis. It is highly predictive and its use in future tests is strongly urged.

Age profiles for the major domesticates were constructed on the basis of epiphyseal fusion stages. The immaturity of these profiles is marked--pigs are the youngest group followed by cattle and sheep/goat. This pattern of immaturity is a radical shift which departs from patterns typical of traditional agricultural economies. In England, this pattern emerges in faunal

samples in the sixteenth century and points to the growing impact of urban centers on the organization of agriculture and the distribution of the fruits of its production. The age profiles also point to a seasonal marketing factor in the availability of piglets, young lamb, and veal.

Maximum prices set for different age categories of meat in the public market of New York are discused in reference to the choices that a consumer might wish to make. The necessity for systematic research into demand, supply, consumption, and marketing is called for to see how the "moral economy" of price fixing might relate to the competitive economy of local butchers. Suits brought against them and household and institutional accounts can give access to real price structures and competition.

The study of the 175 Water Street butchery traces supports the use of the corpus of illustration of frequently occurring cut patterns on bones published by Lee Lyman in the Journal of Historical Archaeology, (1977). The illustrations of this article should be coded for computerization in order to promote standardization in comparisons. This coding procedure is strongly urged for future work. Cuts that are not illustrated in the 1977 publication may be added to the coding system.

The question of wholesale and retail cuts and their relation to consuming units was explored in the analysis of cattle butchery traces. The results are ambiguous. Hindquarters and forequarters (possible sides of beef) were detectable in the sample from Feature 41.

However, it was also clear that these larger units of carcass were trimmed into the most refined of retail cuts. The cattle material from the living floors of Lot 33 represents "soup" cuts of the hindquarter and forequarter. There is no evidence of larger units of the beef carcass in the sample. Does this represent a pattern of garbage disposal or a consumption pattern? These are questions that can and should be tested in research designs for future projects. Careful sampling of an entire lot that has been divided into small quadrants for control over spatial distribution of garbage debris should be set up.

The patterning of bone samples at the feature level is extremely diverse as chi-square tests of species composition in each feature and skeletal composition for pig, sheep/goat, and cattle across every feature indicate. This diversity raises broader questions for the task of synthesis. Is such diversity reflected in the patterning of other artifacts (glass, ceramics, etc.)? Are there temporal or functional interrelationships among the characteristics of the faunal, glass, and ceramic data that might be tested by discriminant analysis to determine what variables play an important role in clustering different features into "group membership"? Finally, how may this synthesis be related to the historical record for the social and economic patterns of occupancy of the lots through time?

A Note on Methodology

Faunal material from 175 Water Street was excavated largely by trowel and water screened through a 1/4 inch wire mesh screen. Flotation samples were

taken from most features, but this material has not been included in the analysis. Birds, reptiles, rodents, and other small mammals of the smaller carnivora range have been identified. However, the focus of this report is a detailed study of the domesticated meat resources of pig, sheep/goat, and cattle. The sheep/goat sample was very fragmentary and the absence of well preserved cranial material and the impossibility of metrical analysis precluded sorting out sheep from goats. On the basis of visual examination most of the material appeared to be sheep.

A recording system was devised that would allow systematic coding of the data suitable for future conversion for computerization. This report is based on manual handling of the data and the consultant will not be the coder of these data for the computer system[1]. It is inevitable that differences in interpretation during recoding will create some discrepancies between the manually generated archive and that which will be computer generated. Manual handling of data also restricted certain discussion on fragmentation and on alteration where the variables involved were too cumbersome for manual sorts.

An analysis of alterations in the bone sample due to burning, gnawing, weathering, etc., has been undertaken at the aggregate level (see Faunal Tables 4.79, 4.80, and 4.81). On the whole, the sample displays low rates of gnawing, weathering, and burning. Low gnawing rates are constant with the absence of dogs on the site. The overwhelming majority of gnawing traces were due to rodents and are concentrated in such features as Feature 1, a cistern, where the rodent sample is high. No burnt deposits were located in the loci of the features. What little bone material had been exposed to heat was mixed with non-burnt material before or during disposal. Weathering and water wear was restricted, on the whole, to those features which had been cut into or rested on the landfill interface. Otherwise weathering was typical of ribs which were very abundant and such tiny fragments was very likely to rest on the surface before being deposited into garbage deposits. The aggregate data for gnawing, burning, and weathering appear in Faunal Table 4.46.

Faunal Table 4.46 175 WATER STREET: Aggregate Rates for Gnawing, Weathering and Burning

(BASED ON FAUNAL TABLES 4.79, 4.80, and 4.81)

	Gnawing #	Gnawing %	Weathering #	Weathering %	Burning #	Burning %
Pig N=290	15	(15.2)	21	(7.2)	4	(1.4)
Sheep/Goat N=935	28	(3.0)	66	(7.1)	9	(1.0)
Cattle N=944	42	(4.5)	86	(9.1)	9	(1.0)

[1]Since writing this, faunal identifications were entered in the computer archive. However, detailed information on skeletal elements, age estimates, epypheseal fusion, and alterations are not in this archive and will be found on cards and tables stored with the collection at the South Street Seaport Museum in New York City (Editor).

Measurements (for mammmal and bird)

The use of standarized osteological measurements in historical archaeology is desirable, since they may be used in studies of sexing and sizing of the animal population. Two factors prevented any measurement samples from being built up from the 175 Water Street data:

(1) immaturity of the sample indicated by a low rate of epiphyseal fused material

(2) degree of butchery precluded the preservation of many complete bones

Both factors, which are undoubtedly typical of late-eighteenth century urban material, will obviate the use of measurements. Only if burials or scrap dumps are located with an abundance of horn cores or matapodia for instance, will it be possible to use these techniques.

Butchery

The consultant strongly urges that the Lee Lyman (1977) set of frequently occurring cuts on long bones be coded and used in recording butchery traces.

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Introduction

The following report summarizes the results of an archaeozoological analysis of domesticated mammal bones from a sample of features excavated during archaeological mitigation of 175 Water Street in lower Manhattan. The basic questions guiding the conception and execution of the research design for this study concern the recovery of similarity and difference in bone samples at the feature level of analysis and the production of a data archive for inter-site comparsion of patterning and diversity at a future time. When the data presented here are later set side by side with fish and bird reports and with ceramic, glass, and other specialist analyses of the 175 Water Street material, much light will be shed on the way the feature deposits both reflect and were constituted by social and economic processes at the scale of the urban backyard and block, and how, in turn, these processes articulated with the social and economic system that produced the developing Atlantic port of New York in the eighteenth and early-nineteenth centuries.

This report is divided into the following sections:

I. Introduction to Research
II. Patterning of the Site Level Analysis
    species composition
    skeletal element distribution
    age
    butchery techniques
III. Patterning at the Feature Level
IV. Feature by Feature Data Archive

Introduction to Research Design

The research design for the study of faunal remains excavated at the 175 Water Street site was formulated from the outset with the awareness that it would be among the first archaeozoological reports to be submitted from a series of excavations located in what was the developing port area of eighteenth and nineteenth-century lower Manhattan. This challenge of terra incognita was met by designing a "study within a study" that would focus on identifying pattern and diversity among one group of food remains -- that of the major domesticates (pig, sheep/goat, cattle) at the feature level -- and would develop a model for the collection and recording of data that would facilitate inter-site comparisons when computerized handling of the data was introduced. Inevitably, the research design involved decisions about selecting context and materials for different levels of analysis. The principles guiding the selective process are set out below.

In order to realize the two-fold objective set within the two-hundred hour period available to the consultant for bone identification and manual data recording, the following research strategy was adopted.

Privies were singled out as the type of feature that would provide the core of material and the context for the study. The reasons for this choice included the following considerations:

(1) Privies were the most frequently encountered feature at 175 Water Street (10 features/55 features) and occurred in evey backyard excavated where later nineteenth-century extensions had not obliterated backyard traces.

(2) The typical fill of privies is conducive to good bone preservation.

(3) Privies are a typical feature on both urban and rural historical archaeological sites.

These reasons provide argument for devoting research time now to understanding the processes that produce privy fills in order to guide sampling and analysis of this feature type in the future. To provide contrast and comparison to the privy sample, a sampler of other types of features were selected for analysis. These include a cistern, a box/cofferdam, and living floors.

Having decided on the context of the faunal sample to be analyzed, the next decision concerned the intensity of the analysis to which the material would be subjected. Several practical factors influenced decisions about a coherent research design in respect to this:

(1) Field estimates for the volume of faunal material were high which made some sampling procedures mandatory, given time constraints.

(2) A comparative sketetal collection of dog, cat, pig, sheep, cattle, and horse was available for laboratory use through the courtesy of the American Museum of Natural History.

(3) No comparative collection of fish and bird has been set up yet in the New York area for archaeozoological purposes.

It was therefore decided to concentrate on the domesticated mammal sample and to subject this portion of the faunal sample to in-depth analysis. The abundant fish and bird samples along with reptile, amphibian, and rodent bones were counted for each locus and stored by feature for subsequent analysis. The identification of the faunal material took place at the Soil Systems laboratory at 106 Fulton Street, N.Y., where the comparative reference collection was located. The 200 hours of identification and recording spanned a period from mid-February, 1982 to early May, 1982. Edwina Gluck provided competent assistance from mid-March onwards.

Patterning at the Site Level of Analysis

Faunal material from the following features was examined: Feature 51, privy; Feature 50, privy; Feature 49, box; Feature 48, privy; Feature 47, privy; Features 42 and 43, privy within a privy; Feature 44, privy; Feature 41, privy; Feature 32, privy; Feature 28, orange living floor; Feature 27, grey living floor; Feature 2, privy; and Feature 1, cistern. A summary of

the data ay be found in Faunal Table 4.47. The gross counts are tabulated feature by feature in Faunal Table 4.48. The catalog number and locus breakdown of data for each feature may be found in the computer data archive and with the collection at the South Street Seaport Museum.

Faunal Table 4.47 175 WATER STREET: Gross Fragment Counts

Minor domesticates	
Cat (Felis domesticus)	99
Major domesticates	
Pig (Sus domesticus)	290
Sheep/Goat (Ovis aries/Capra hircus	935
Cattle (Bos taurus)	944
	2169
Ranged Material	
Large Mammal (Cattle-Horse range)	443
Medium Mammal (Sheep-Pig-Dog range)	980
	1423
Sorted Groups	
Bird	1344
Fish	5854
Rodent	812
Reptile & Amphibian	188
Total domesticates identified to species	2268
Total other sorted	11610

The absence of dog and horse in the domesticated material is striking. Special attention was paid to making these identifications when their absence was noted in the first features analyzed. No large wild mammal bone, such as deer, was identified in the sample either, although deer material was expected and closely watched for. Several small mammal bones fall within the small carnivore range, raccoon or mustelid groups.

For this section of the report the feature by feature breakdown of data on species representation, skeletal element frequencies, epiphyseal fusion stages, estimated age observation for bone without analytical aging criteria, and cultural and natural alterations to bone recorded by species and skeletal element will be aggregated in order to arrive at a sense of gross patterns for the site. In aggregating the data, chronological and functional distinctions are blurred. It is only at this level, however, that sample sizes are

Faunal Table 4.48 175 WATER STREET: Bone Fragment Frequencies

Feature	Cat	Pig	Sheep/Goat	Cattle	Rodent	Bird	Fish	BOS-EQ Range	OV-CAP-CAN Range	XD Mammals
41 privy	18	43	338	326	64	300	1465	122	237	358
42, 43, 46 privy	39	75	109	152	42	201	239	110	179	684
49 "box"	2	44	72	95	20	87	883	39	71	136
27, 28 living floor	27	25	108	75	G50 012	G138 0101	G1098 0 565	G29 0 9	G152 0 37	G38 089(I138g)
2 privy	1	32	76	91	168	159	385	44	61	223
51 privy	8	14	72	72	210	177	655	13	76	114
50 privy	2	19	35	43	24	83	285	15	45	66+(48g)
48 privy	0	14	41	28	5	39	143	11	41	80
1 cistern	0	12	45	21	216	21	85	13	39	21
32 privy	0	2	17	19	0	5	19	14	16	19
44, 45 privy	0	8	13	11	1	21	23	19	15	139
47 privy	2	2	6	10	0	11	5	5	9	22
TOTALS	99	290	932	943	812	1343	5850	1443	978	1989

large enough to construct age profiles for the domestic species, etc. At the feature level, samples sizes are often too small to make such generalizations. The arrangement of data in this section therefore provides a somewhat artificial backdrop against which pattern and diversity in the individual features may be brought out.

The first aspect of the sample to be considered is the distribution of bone sample sizes in the features. The twelve features under study may be divided into four groups by sample size.

Faunal Table 4.49 175 WATER STREET: Sample Size Ranges of Domesticated Mammal Material

	Feature # Type	Sample Size
Large	Feature 41, privy	707
Medium	Features 42, 43, and 46, privies and drain	336
	Feature 49, box	211
	Features 27 and 28, living floors[2]	207
	Feature 2, privy	199
	Feature 51, privy	158
	Mean sample size	222
Small	Feature 50, privy	97
	Feature 48, privy	83
	Feature 1, cistern	78
	Mean sample size	86
Very Small	Feature 32, privy	38
	Features 44 and 45, privies	32
	Feature 47, privy and drain	18
	Mean sample size	29

The size breakdown of the samples may be evaluated from interim field information on the chronology of the features, and from the relation of the size of the major domesticates bone sample to the size of bird and fish samples in each of the features. The following observations may be made:

[2]Bone samples from orange and grey surfaces in Lot 33 have been consolidated for the purpose of sample size. They are statistically similar in species and skeletal composition.

(1) Privy samples are found in each of the size groups and the largest samples come from a privy (Feature 4).

(2) The earliest privies (based on interim field information) F51, F50, F41, F32 are distributed across the size categories. Disturbed privies (those into which drains or other features were cut), F48, F42, F43 and F46, F47, and F45 also vary in sample size.

(3) Later features such as Feature 47, a privy, and Feature 1, a cistern, have smaller sample sizes.

No clear cut chronological or functional patterning emerges in the amount of bone material that might be found in a privy -- a first strand of evidence for variability in disposal of material into privies through time and across space. When the variability of domesticated mammal bone sample size is compared with ceramic and glass deposition, the disposal of material will be more fully understood -- the rapidity with which fill was created, its homogeneity, etc.

When the mammal bone sample size is considered along with fish and bird samples, a definite pattern does emerge (see Faunal Tables 4.48 and 4.50 and Figure 4.7). An examination of the data for sample size and its visual representation in Figure 4.7 makes it clear that features with large domestic bone samples have proportionally large bird and fish samples. This means that a diversified pattern of disposing material was practiced, presumably reflecting a diversified diet. There are two cases where fish remains are at least 10% greater than bird or major domesticates--Feature 49 and the "living floors" of Lot 33 (Features 27 and 28). Both are early features and provide an interesting case for detailed analysis and comparision of the fish remains. Finally, it would be advisable to have the weights of the molluscan samples taken in the field entered into the computer archive so that further insight into the combination of major domesticates, bird, fish, and shell may be gained[3].

Species Composition

Species composition is the next pattern to be considered. As may be seen in Faunal Table 4.48, sheep/goat (935/2169=43.1%) and cattle (944/2169=43.5%) are evenly represented with pig following in order of fragment abundance (290/2169+13.3%)[4].

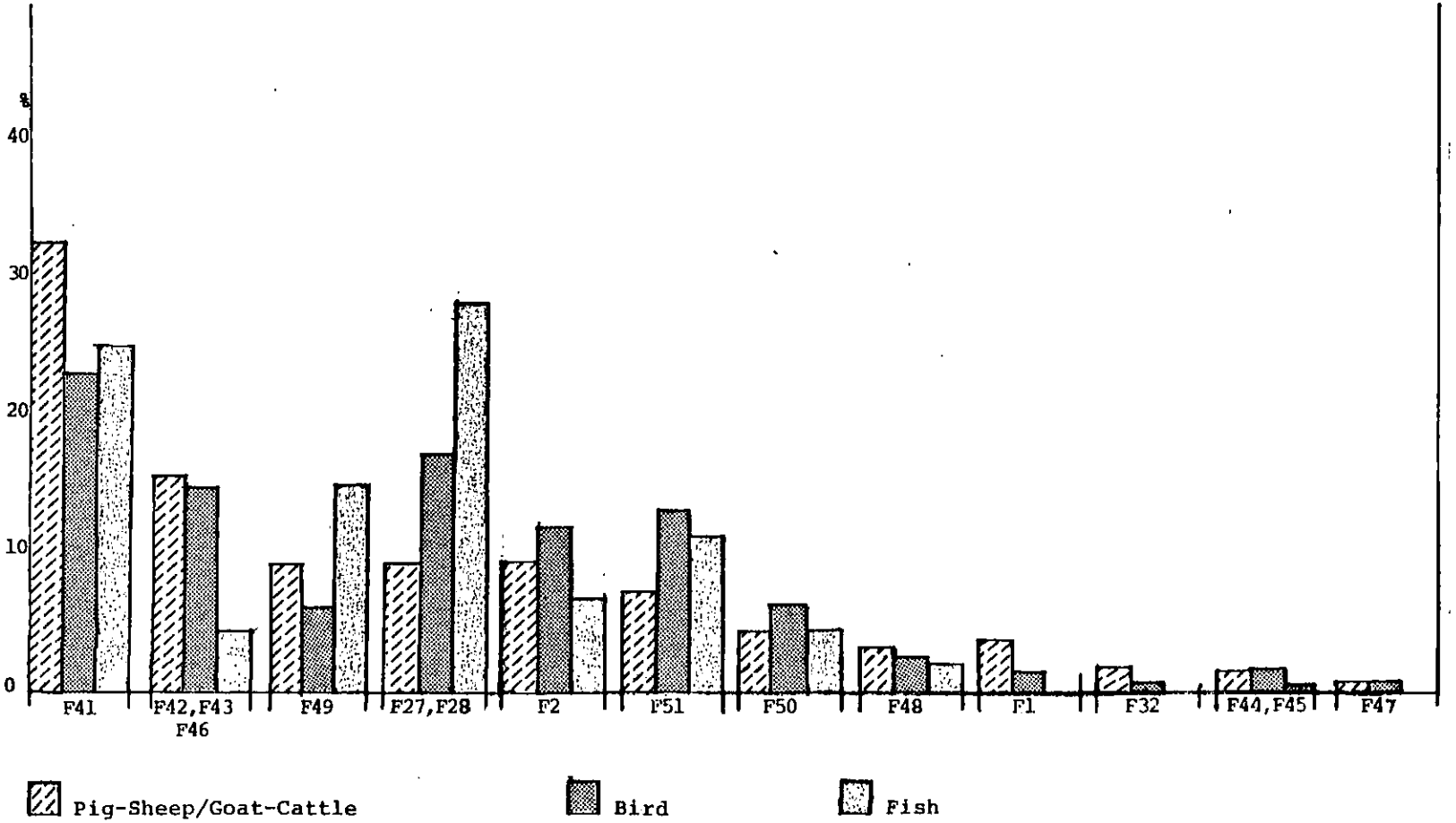
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[3]Subsequent to writing this report, molluscan samples were recorded as weights in the computer archive (editor).

[4]None of the various methods of calculating minimum number of individuals have been employed here since the author agrees with colleagues who see this method as a secondary quantification procedure predictably dependent on the unit of analysis chosen (e.g., locus, feature, site) and the sample size.

Figure 4.7
175 WATER STREET

Fauna
Major Domesticates, Bird, and Fish by Feature*



*see Faunal Table 4.8 for data

Faunal Table 4.50 175 WATER STREET: Sample Size Ranking by Feature for Identified Major Domesticates and Tallied Bird and Fish Samples

Major Domesticates			Bird		Fish	
Rank	% of N	Feat.	Rank	% of N	Rank	% of N
1	32.6	41	1	22.3	2	25.1
2	15.5	42, 43, 46	3	15.0	7	4.1
3	9.7	49	6	6.5	3	15.1
4	9.5	27, 28	2	17.8	1	28.4
5	9.2	2	5	11.9	5	6.6
6	7.3	51	4	13.2	4	11.2
7	4.5	50	7	6.2	6	4.9
8	3.3	48	8	2.9	8	2.4
9	3.6	1	9	1.6	9	1.5
10	1.8	32	11	.4	11	.3
11	1.5	44, 45	9	1.6	10	.4
12	.8	47	10	.8	12	.08
	N=2165			N=1343		N=5850

This proportional composition of major domesticates raises questions about the nature of food supply in Manhattan in the late-eighteenth and nineteenth centuries which require both historical and comparative archaeozoological investigation. Three areas of research suggest themselves:

(1) Demand--to what extent was the late eighteenth-century household in Manhattan sufficient in food consumption (dairy cows, poultry, gardens, eggs, etc.) and to what extent was it dependent on food supply in the urban area--how did degree and nature of sufficiency correlate with occupation, status, location, ethnicity, etc?

(2) Supply--how did commercial supply and marketing of meat within the city function? Did this system favor one animal or age group over another--possibly reflecting larger forces at work in the pattern of agricultural production at the regional level?

(3) Consumption--what was the technology and economics of consumption? How much of the final butchery process (i.e., preparation of trimmed cuts) took place at the household level? What were typical cooking facilities? What were popular attitudes towards dining? Research into the pricing of wholesale and retail cuts is also essential, since a simple extrapolation of prices and tastes of today is inappropriate.

The systematic study of demand, supply, and consumption lies outside of this report. Some comments at the descriptive level may be offered. The low representation of pig is surprising. Popular accounts frequently mention the abundance of the animal in the city (eg., Devoe 1862). Keeping this animal is emininently suitable at the household scale. Its low representation at 175 Water Street might reflect a pattern of consumption not at the household level. In this respect the early privy (Feature 50) and the box (Feature 49) are interesting since they reflect a high incidence of pig (F50-19/97+19.6%; 20.2-14/83 16.8%), although the actual composition of the pig sample in the two features is quite different. A hypothesis that emerges for future testing is that the earliest activity on the site was related to development of the area at the household level and once the block was consolidated and the lot boundaries in place that subsequent use of the area took place at a commercial scale characterized by consuming units not coincident with household units. Whether structurally different consumption units may be distinguished in the archaeological record is a problem that requires an integrated approach among specialists and cannot be answered by faunal analysis alone.

The variability in the proportion of species representation will be discussed in further detail in the section on patterning. It may be observed here that the actual proportional representation for pig, sheep/goat, and cattle fluctuates in a similar way across the features.

Faunal Table 4.51 175 WATER STREET: Mean Proportional Representation Across Features

Pig	X	15.0%	+ 6.4%
Sheep/Goat	X	42.6%	+ 8.2%
Cattle	X	42.3%	+ 7.9%

Skeletal Element Frequencies

Skeletal element frequencies aggregated from the features appear in the "total" column in Faunal Table 4.52 for pig, Faunal Table 4.55 for sheep/goat, and Faunal Table 4.62 for cattle, and are illustrated in Fig. 4.8, Fig. 4.9, and Fig. 4.10, respectively. Although differences in the skeletal composition are not striking in these figures, statistical comparisons, in fact, indicate dissimilarities. If skeletal elements are grouped into categories for statistical comparison, cranial (horncore, skull, maxilla, teeth mandible), edible (vertebrae, ribs, scapula, humerus, radius, ulna), podial (metapodia, carpals, tarsals, phalanges), the skeletal composition are dissimilar for all the possible comparisons (as an aggregated group $x^2=174.5 > 9.45_{(.05)}$ 4df; pig:sheep/goat - $x^2 = 126.4 > 5.99_{(.05)}$ 2df; sheep/goat:cattle- $x^2 = 31.7 > 5.99_{(.05)}$ 2 df; pig:cattle- $x^2 = 121.0 > 5.99_{(.05)}$ 2 df). Skeletal element frequencies will now be discussed animal by animal.

Pig

The striking aspect of pig skeletal element frequencies (see Fig. 4.8) are their fairly even distribution across the skeleton. Cranial elements are two to five times more abundant for pig than for sheep/goat and cattle. Of the cranial elements, teeth constitute a high proportion. In three out of twelve features, teeth or other skull elements are the most frequently occurring skeletal element (Faunal Table 4.53). Podial elements, with the pig--phalanges--occur most frequently in five other features. As will be discussed later, pigs have the youngest population profile among the site's major domesticates, and the bulk of the pig eaten were piglets or young pigs. Given the even skeletal distribution seen in Faunal Table 4.52, it is possible that the pigs were prepared to be eaten as roast piglet. The comparatively low representation of vertebra and ribs, given their better chances of occurring in the frequencies, certainly seem to suggest that loin and bacon (wholesale cuts) or loin roasts, tenderloins, Canadian bacon, loin chops, or spare ribs (retail cuts trimmed out of the wholesale cuts) were not eaten more frequently than other parts of the skeleton.

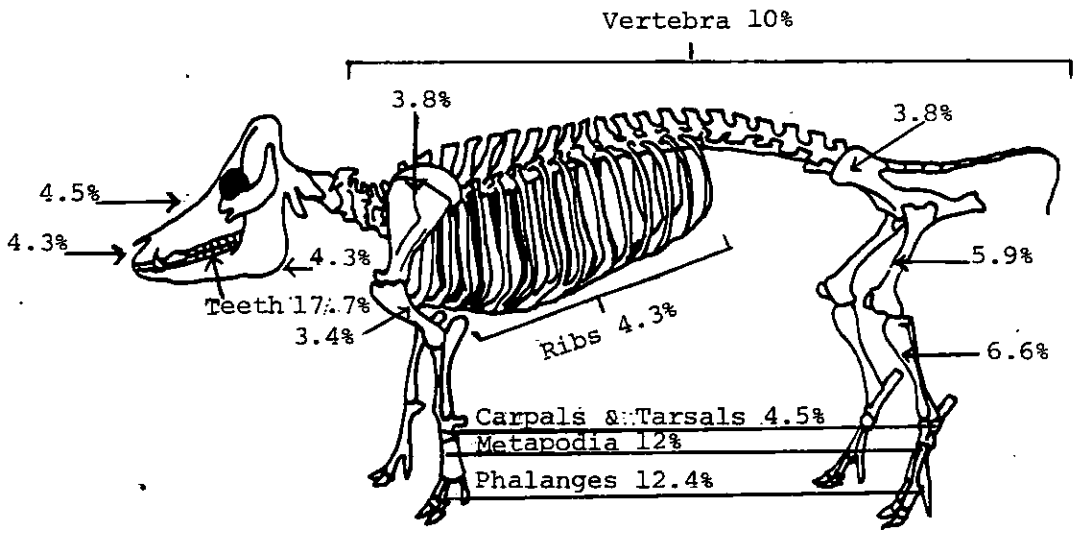
If pigs were kept in the city, as the sources indicate, and given their reproductive potential of two litters per year with an average of six to eight pigs per litter, roast piglet would have been a commonly available meat source. A meal of roast piglet may also imply a household style consumption

Faunal Table 4.52 175 WATER STREET: Aggregated Total Skeletal Element Frequencies for Pig

	Totals #	Totals %
horn core/antler		
skull	13	4.5
maxilla	2	.7
mandible	12	4.3
teeth	50	17.2
vertebrae	29	10.0
ribs	12	4.3
scapula	11	3.8
humerus	10	3.4
radius	5	1.7
ulna	4	1.4
MC		
pelvis	11	3.8
femur	17	5.9
tibia	19	6.6
carpals/tarsals	13	4.5
MT	1	.3
MP	34	11.7
phalanges	36	12.4
other	11	3.8
	290	

Figure 4.8
175 WATER STREET

Fauna
Pig Skeleton



Faunal Table 4.53 175 WATER STREET: Most Frequently Occurring Skeletal Elements by Feature for Pig

Feature	1		2		3	
41	teeth	13	phal.	9	tibia	5
N=43		30.2%		20.9%		11.6%
42, 43, 46	teeth	24	vert	6	tibia	5
N=75		32 %		8 %	c/t	5 6.6%
					phal	5
49	phal.	17	MP	8	mand.	4
		38.6%		18.2%	vert	4 9.1%
27, 28	phal.	5	teeth	4	mand	2
N=24		20.8%	vert	4 16.6%	scap	2 8.3%
					pelvis	2
2	phal	6	vert	5	femur	3
N=32		18.7%		15.6%	c/t	3 9.4%
					phal	3
51	phal	3	teeth	2	fibula	1
N=14		21.4%	MP	2 14.3%		7.1%
50	vert	3	teeth	2	other	1
N=19		15.8%	ribs	2		5.7%
			hum	2 10.5%		
			femur	2		
			fibula	2		
48	tibia	3	vert	2	other	1
N=14		21.4%	femur	2		
			MP	2 10.5%		
1	skull	4	SAMPLE SIZES TOO SMALL FOR			
N=12		33.3%	FURTHER BREAKDOWN			
32	tibia	1				
N=2	c/t					
44, 45	vert	2				
N=8	MP	2				
47	vert	1				
N=2	phal	1				

pattern where the food is consumed by a group of people at one sitting. If the systematic study of demand, supply, and consumption suggests that roast piglet was available and enjoyed during the period, then its low representation may suggest some other type of consumption unit which did not favor food resources suitable to discrete communal eating episodes. This is, of course, one hypothesis from a range of possibilities.

The skeletal element frequencies of the pig and possible interpretions must be evaluated against the evidence of butchery traces. Faunal Table 4.54 below breaks down the frequencies of different types of cut marks in relation to the total number of butchery traces. The frequencies for sheep/goat and cattle have been included for comparision (see Faunal Tables 4.79, 4.80, 4.81 for the data from which Faunal Table 4.54 has been constructed). Chop ax marks usually relate to primary butchery processes which cut the carcass along critical axial points (e.g., down the vertebral column and at the articulation points of limbs). Dull blow marks, including hack marks, are the traces of secondary butchery processes involved in the production of smaller trim cuts. Sharp knife marks can occur at any point in the disarticulation, trimming, and consumption of the meat.

Faunal Table 4.54 175 WATER STREET: Distribution of Types of Butchery Traces for Pig, Sheep/Goat, and Cattle (based on Faunal Tables 4.79, 4.80, and 4.81 for Aggregate Alterations)

	Chop Ax	Dull Blow	Sharp Knife	Saw	Total	(N-teeth) % of N
PIG	22	4	23	2	51	(21.1)
% of traces	(9.2)	(1.7)	(9.6)	(.8)		
SHEEP/GOAT	88	16	51	6	161	(17.7)
% of traces	(9.7)	(1.8)	(5.6)	(.7)		
CATTLE	138	60	60	122	380	(24.7)
% of traces	(15.2)	(6.6)	(6.6)	(13.4)		

For the pig it is clear that disarticulated carcasses were present--as the proportion of chop ax marks among the butchery traces indicates. Sectioned vertebra, which indicate that the carcass was split down the middle, comprise 27.5% (8/29) of the chop ax traces. Sharp knife traces have their highest relative frequencies among the pig bones. High frequencies for sharp knife cuts may be expected when carving after roasting serves as a primary way of cutting up the carcass in contrast to pre-cooking processing of the carcass into cuts through trimming.

Further hypotheses about the type of pork cuts eaten may be tested when the data are computerized. This will allow the degree of fragmentation of

Faunal Table 4..55 175 WATER STREET: Aggregated Total Skeletal Element Frequencies for Sheep

	Totals #	Totals %
horn core/antler	2	.2
skull	12	1.3
maxilla	2	.2
mandible	12	1.3
teeth	22	2.4
vertebrae	190	20.4
ribs	215	23.1
scapula	26	2.8
humerus	35	3.8
radius	26	2.8
ulna	19	2.1
MC	29	3.1
pelvis	49	5.6
femur	48	5.2
tibia	54	5.8
carpals/tarsals	77	8.3
MT	22	2.4
MP	25	2.7
phalanges	63	6.8
other	4	.4
	932	

Faunal Table 4. 56 175 WATER STREET: Most Frequently Occurring Skeletal Elements by Feature for Sheep/Goat

Feature	1		2		3	
41	ribs	143	vert	45	c/t	22
N=338		42.3%		13.8%		6.5%
42, 43, 46	phal	17	c/t	14	vert	10
N=109		15.5%		12.8%	tibia	10 9.8%
49	vert	17	pelvis	10	c/t	9
N=72		23.6%		13.8%		12.5%
27, 28	vert	35	ribs	24	c/t	11
N=108		32.4%		22.2%		10.2%
2	vert	23	ribs	13	ulna	5
N=76		30.3%		17.1%		6.6%
51	vert	33	ribs	12	phal	7
N=72		45.8%		16.6%		9.7%
50	vert	8	ribs	4	misc	3
N=35		22.8%	phal	4 11.4%	(4 x)	8.6%
48	vert	9	ribs	8	c/t	5
N=41		21.9%		19.5%		
1	phal	14	MT	6	vert	5
N=45		31.1%		13.3%		12.2%
32	vert	4	SAMPLES TOO SMALL FOR			
N=17		23.5%	FURTHER BREAKDOWN			
44, 45	phal	4				
		30.8%				
47	radius	3				
N=6		50.0%				

Faunal Table 4.57 175 WATER STREET: Breakdown of Vertebra Frequencies for Sheep/Goat and Cattle

CATTLE	TOTAL VERT	CERVICAL	THORACIC	LUMBAR	CAUDAL	SACRUM (PELVIS)	OTHER	TOTAL RIBS	HNS	SHAFT	XD
41	139	25	10	25	72	5 (34)	2	51	32	19	
42, 43, 46	45	6	12	20	2	2 (13)	3	24	6	18	
49	13	0	8	3		2 (13)		37	12	25	
27, 28	20	3	8	6	0	1 (8)	2	17	6	11	
2	17	2	7	6	1	0 (8)	1	12	4	8	
51	19	4	4	7	0	2 (1)	2	18	8	10	
50	10	1	4	4		1 (1)		8	2	6	
48	10	1	1	4	3	0 (4)	1	4	3	1	
1	5	2	3	0		(0)		5	2	3	
32	3			2		(0)	1	7			7
44, 45	1		1					4	2	2	
47	1	1						0			
		44	58	77	78	13	12	187	77	103	7
SHEEP											
41	45	22	13	9	1	0 (20)	0	143	134	9	
42, 43, 46	10	4	1	4		1 (5)		3	3		
49	17	3	4	7		3 (10)		2	2		
27, 28	35	11	11	11	1	1 (1)	0	24	24		
2	23	11	6	5		1 (1)		13	9	1	3
51	33	9	7	12	2	2	1	12	8	4	
50	8	1	2	4		1 (0)		4	3	1	
48	9	6	2	1		(1)		8	8		
1	4	1		3		(1)		5	3	2	
32	4	1		2		1 (1)		0			
44, 45	2			2		(1)		1	1		
47	0					(2)		0			
		69	46	60	4	10	1	215	195	17	3

the individual skeletal elements to be tabulated. This locational information can further pinpoint aspects of whole carcass consumption (roasting) and consumption of trimmed pork.

Sheep/Goat

Vertebra and ribs constitute almost half (405/932=43.4%) of the sheep/goat bone sample (see Faunal Table 4.55 and Fig. 4.9). In nine out of twelve features, ribs or vertebra were the most frequently occurring element (Faunal Table 4.56). Cervical, thoracic, and lumbar are more evenly represented for sheep than for cattle (see Faunal Table 4.60). When their frequencies are compared they are found to be dissimilar (x^2= 8.98 5.9 (.05) 2 df).

Faunal Table 4.58 175 WATER STREET: Cervical Thoracic Lumbar Frequencies for Sheep/Goat and Cattle (based on Faunal Table 4.57)

	Cervical # %	Thoracic # %	Lumbar # %	Total
Sheep	69 (39.4)	46 (26.3)	60 (34.3)	175
Cattle	44 (24.6)	58 (32.4)	77 (43.1)	179

The marked difference between the sheep/goat sample and cattle lies in the higher representation of cervical vertebra for sheep/goat and lumbar for the cattle. Neck cuts are more important for sheep/goat. This importance is borne out when the correlation of frequencies of occurrence of the different vertebral units are compared across the various features (NB across nine features, the remaining three being too small for comparison).

Faunal Table 4.59 175 WATER STREET: Correlation of Vertebral Units for Sheep/Goat

r = .539 t = 1.66 p(.05) 7 df
cervical, thoracic

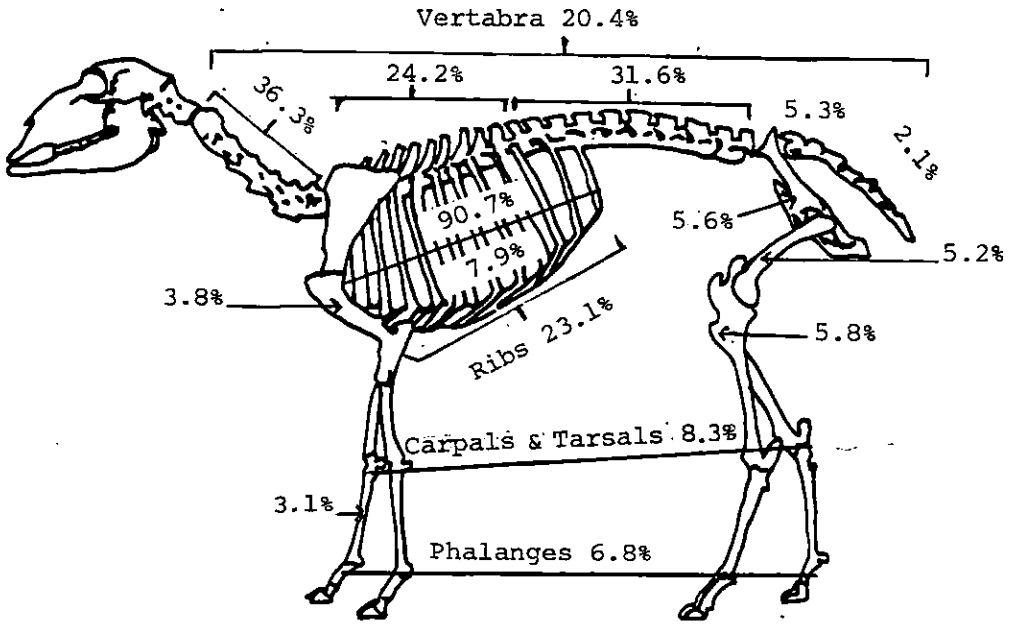
r = .904 t = 5.49 p(.05) 7 df
cervical, lumbar

r = .788 t = 3.32 p(.05) 7 df
lumbar, thoracic

These calculations mean that cervical and lumbar, and lumbar and thoracic vertebral frequencies vary in relation to each other. There are too many

Figure 4.9
175 WATER STREET

Fauna
Sheep Skeleton



Faunal Table 4. 60 175 WATER STREET: Proportional Forelimb and Hindlimb Representation

FEATURE	N	Forelimb	%	Hindlimb	%
CATTLE					
41	326	39	11.9	47	14.4
42, 43, 46	152	12	7.9	32	21.1
49	95	3	3.2	29	30.5
27,28	75	6	8.0	6	8.0
2	91	12	13.2	20	30.0
51	72	6	8.3	9	12.5
50	43	6	13.9	3	7.0
48	28	4	16.6	5	17.8
1	21	9	42.8	2	9.5
32	19	2	10.5	2	10.3
45, 45	11	1	9.1	1	9.1
47	10	0	0	1	10.0
FEATURE					
SHEEP					
41	338	39	11.5	50	14.8
42, 43, 46	109	16	14.7	24	22.0
49	72	7	9.7	21	29.2
27,28	108	13	12.0	16	14.8
2	76	11	14.5	7	9.2
51	72	3	4.2	7	9.7
50	35	2	5.7	5	14.3
48	41	6	14.6	6	14.6
1	45	2	4.4	2	4.4
32	17	2	11.8	2	11.8
45, 45	13	3	23.1	2	15.4
47	6	3	50.0	2	33.3

Forelimb=scapula, humerus, radius, ulna
Hindlimb=pelvis, femur, tibia

Faunal Table 4.62 175 WATER STREET: Aggregated Total Skeletal Element Frequencies for Cattle

	Totals #	Totals %
horn core/antler	2	.2
skull	33	3.5
maxilla	1	.1
mandible	17	1.8
teeth	33	3.5
vertebrae	282	29.9
ribs	187	19.9
scapula	22	2.3
humerus	25	2.7
radius	32	3.4
ulna	13	1.4
MC	9	1.0
pelvis	78	8.3
femur	50	5.3
tibia	29	3.1
carpals/tarsals	69	7.3
MT	5	.5
MP	10	1.1
phalanges	26	2.8
other	18	1.9
	941	

Faunal Table 4.63 175 WATER STREET: Most Frequently Occurring Skeletal Elements by Feature for Cattle

Feature	1		2		3	
41	vert	139	ribs	51	pelvis	34
N=326		42.6%		15.6%		10.4%
42, 43, 46	vert	45	ribs	24	pelvis	13
N=152		29.6%		15.7%	femur	13 8.5%
49	ribs	37	vert	13	femur	8
N=95		38.9%	pelvis	13 13.7%	tibia	8 8.4%
27, 28	vert	20	ribs	17	skull	8
N=75		26.6%		22.6%	c/t	8 10.6%
2	vert	17	ribs	12	pelvis	8
N=91		18.7%		13.2%	femur	8 8.8%
					teeth	8
51	vert	19	ribs	18	c/t	10
N=72		26.4%		25.0%		13.8%
50	vert	10	ribs	8	teeth	4
N=43		23.3%		18.6%		9.3%
48	vert	10	ribs	4	skull	2
N=28		35.7%	pelv	4 14.3%	radius	2 7.1%
					c/t	2
1	vert	5				
N=21	ribs	5	c/t	3	costal	2
		23.8%		14.3%		
32	ribs	7	SAMPLE SIZES TOO SMALL FOR			
N=19		36.8%	FURTHER BREAKDOWN			
44, 45	ribs	4				
N=11		36.4%				
47	phal	5				
N=10		50.0%				

cervical vertebra and too few thoracic for this to hold true for their relation. The implications of this correlation for constructing a predictive model that might be used for sampling in the future will be discussed in the section on cattle. Sampling vertebra and predicting their relations would be helpful since they are the most abundant elements and time consuming to identify. Many reports ignore their identification which is tantatmount to omitting the most important source of information about the sample.

Rib frequencies and thoracic and lumbar frequencies are not correlated across the features ($r = .518$ $t = 1.60$ 2.36 $p_{(.05)}$ 7 df); nevertheless, the fact that the overwhelming majority of sheep/goat ribs (90.7%) consisted of head/neck/shaft portions indicates that rib and loin chops were eaten.

The hindquarter bone of the sheep/goat (pelvis, femur, tibia) are better represented at the aggregate level (Faunal Table 4.60). Forelimb frequencies (scapula, humerus, radius, ulna) exceed hindlimb frequencies in only three features, and two of these examples are from the two smallest samples where skewing is inevitable.

The frequencies of sheep/goat podial fragments--carpals, tarsals, metapodia, and phalanges--are also well represented and in fact fluctuate less across features than edible elements.

Faunal Table 4.61 175 WATER STREET: Mean Proportional Representation of Cranial Edible and Podial Elements for Sheep/Goat

cranial	X	5.7%	±	3.6%
edible	X	68.8%	±	12.2%
podial	X	25.2%	±	10.4%

The good representation of podial elements raises questions about demand, supply, and consumption:

(1) Were fore and hind quarters purchased untrimmed--i.e., with hoofs on--and then dressed according to the economic preference of the consumer? Did trimmed cuts include the hoof, a practice not followed today?

(2) Were podial elements used for some specialized task such as the rendering of oil--a process more common with cattle where phalanges were boiled for oil to be used in the leather industry?

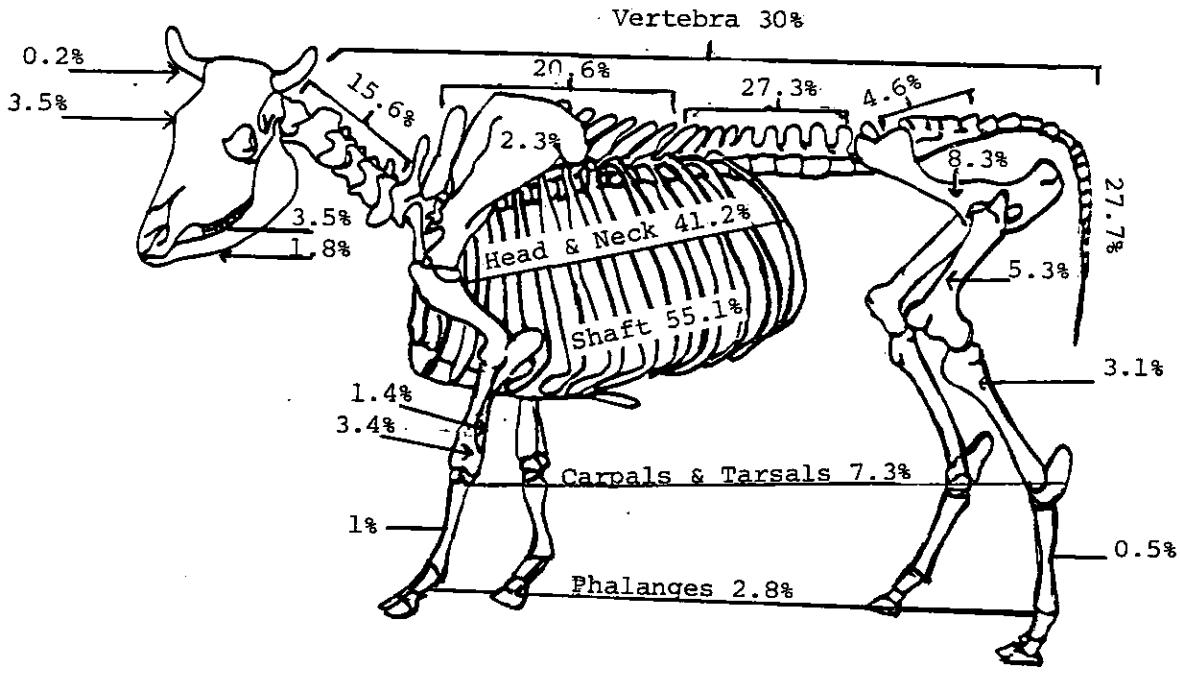
(3) Did primary butchery occur at the site? (The low representation of cranial elements would argue against this however.)

Cattle

As with sheep, vertebra and ribs are the most frequently occurring skeletal elements and the most abundant cattle elements in 11 of 12 features

Figure 4.10
175 WATER STREET

Fauna
Cattle Skeleton



(Faunal Tables 4.62, 4.63, and Fig. 4.10). Ribs, with their head, neck, and shaft portions, are significantly correlated with the thoracic and lumbar vertebra, which supports the idea that rib roasts and chops were eaten (Faunal Table 4.64)

Faunal Table 4.64 175 WATER STREET: Correlation of Thoracic and Lumbar Units with Ribs with Head, Neck, and Shaft Portions[a]

Thoracic +	Feature Frequencies								
Lumbar	35	32	11	14	13	11	8	5	3
Ribs	32	6	12	6	4	8	2	3	3

$r = .702 \quad t = 2.95 > 2.365\ p_{(.05)}\ 7\ df$

It has already been noted that large vertebra samples, characteristic of urban archaezoological samples, are time consuming to identify. Some testing has been undertaken, therefore, to determine whether or not a causal interpretation of their frequencies could be constructed.

First, it was noted that across features the frequencies of cervical and thoracic vertebra did not correlate (the same result was found with sheep--the varying numbers of vertebra does not seem to be the cause either). Cervical and lumbar units and thoracic and lumbar units do correlate (see Faunal Table 4.65).

Faunal Table 4.65 175 WATER STREET: Correlation of Vertebral Units for Cattle (based on data from Faunal Table 4.57)

$r = .475 \quad t = 1.52 \quad 2.306 \quad 6df$
cervical, thoracic

$r = .87 \quad t = 4.97 \quad 6df$
cerival, lumbar

$r = .70 \quad t = 2.75 \quad 6df$

A better series of correlations came from a potentially more interesting series of interrelationships -- that of lumbar, sacrum, and pelvis -- or the

[a]Lumbar vertebra are included since the hindquarter of cattle is disarticulated with the last two rib sections.

key units involved in disarticulating the hindquarter. The frequencies of lumbar vertebra, the most frequently occurring type of vertebra for cattle, were stongly correlated with the frequencies of pelvis and sacrum across features (Faunal Table 4.65 based on data set out in Faunal Table 4.57).

Faunal Table 4.65 175 WATER STREET: Correlation of Lumbar Vertebra with Pelvis and Sacrum Frequencies Across Features for Cattle

lumbar	25	20	3	6	6	7	4	4	sacrum	5	2	12	1	0	2	1	0
pelvis	34	13	13	8	8	1	1	4									

r = .786 t = 4.79 (.05) 6 df
lumbar sacrum

r = .81 t = 5.22 (.05) 6 df
lumbar pelvis

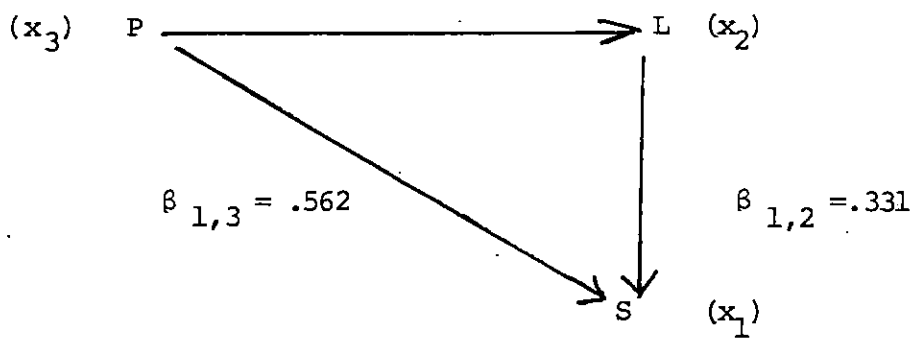
r = .83 t = 5.67 (.05) 6 df
sacrum, pelvis

If a causal model interpreting these significant interrelationships could be constructed, then it would be possible to sample vertebral ratios in the future based on the easily identifiable element of the pelvis. The cattle pelves in the 175 Water Street sample are also characterized by the highest rate of butchery traces which makes them an important element to study. Further, the hindquarter of the cattle is better represented than the forequarter at the aggregate level and in most of the individual features (see Faunal Table 4.60 and Fig. 4.10).

The following model (Figure 4.11) was constructed for testing (see also Faunal Table 4.67).

Figure 4.11
175 WATER STREET

Fauna
Causal Model --
Vertebral Determinator



Faunal Table 4.67 175 WATER STREET: Decomposition Table for Path Analysis

	Pelvis, Lumbar	Pelvis, Sacrum	Lumbar, Sacrum
	$x_{2,3}$	$x_{1,3}$	$x_{1,2}$
r	.81	.83	.786
1 causal-direct	.81	.562	.331
2 causal-indirect	.00	.268	00
c total causal	.81	.830	.331
r-c noncausal	.00	.00	.455

The decomposition table above assesses the relevant subsystems in the model (Fig. 4.11) by examining their path coefficients (see SPSS 1975: 385-389). From this breakdown it is possible to evaluate how predictively causal the model is. The results may be interpreted as follows. The pelvis is the crucial variable. It has a very stong direct causal effect on the lumbar (2, 3 = .81), and both a direct and indirect effect on the sacrum.

Its indirect effect on the sacrum is mediated through the lumbar and is clearly secondary (B 1,3 indirect=.268) while its direct effect is moderately strong (B 1,3a=.562), accounting for two-thirds of the total causal impact. The lumbar's direct effect on the sacrum is weak (B 1,2=.331), though the two are highly correlated. No indirect effect is present, and the result is that a moderate degree of non-causal influence is registered (0.455). Part of this is explained by the indirect effect of the pelvis on the sacrum; subtracting the latter leaves a total unexplained influence of only .187. This small unexplained residual effect is undoubtedly related to technical differences in the way the hindquarter was trimmed for such cuts as sirloin, round, and rump. The actual evidence of this butchery process will be discussed in further detail in the section on butchery. The model is highly predictive and supports further work on using the pelvis as a predictor in future sampling.

Another striking aspect of the distribution of vertebral elements for cattle is the high incidence of caudal (tail) vertebra. These are largely confined to Feature 41 which shows evidence of primary processing of hindquarters which will be discussed below.

Finally, metapodia and phalanges of cattle are not well represented (see Faunal Table 4.62) which suggests that they were not present on the meat being consumed and later disposed into the features. Their removal for industrial purpose related to bone working and oil rendering for the leather industry would occur most likely at the primary slaughtering stage.

Age Profiles

Age profiles for pig, sheep/goat and cattle are constructed by recording information on fused and unfused epiphyses and then grouping these data into stages or intervals using the fusion dates published in Silver (1969). The study of mandibular teeth wear (Grant 1975; Payne 1973) offers a contrast and check to the epiphyseal fusion data (Hamilton 1978; Wilson 1978); however the low representation of mandibles in the 175 Water Street sample does not allow the construction of frequency graphs for teeth wear stages. The abundance of epiphyses across features recorded for pig in Faunal Table 4.69, sheep/goat in Faunal Table 4.70 and cattle in Faunal Table 4.71 is variable both by element and by stages, and presence or absence is influenced by a combination of butchery procedures and the biodegradability of different types of epiphyses. In my own experience with bone samples, however, I found the preservation of immature bone to be excellent at 175 Water Street. For instance, I had never encountered unfused bones of the pelvis until working with bone from this sample. On the other hand the age profile, as we shall see, is a very young one which may also imply simply that there was a larger population of young material from which the sample of epiphyses could be preserved.

The results of construction age profiles are graphed in Fig. 4.12. The 175 Water Street sample is predominantly immature for all three major domesticates and this pattern distinguishes the age profile from profiles of samples excavated from traditional rural economies in Europe with which the author has worked (Biddick 1980, 1983). In Europe this radical shift towards exploiting younger animals in urban markets seems to take place in the sixteenth century (Maltby 1979).

It is clear that the urban market exerted a strong pull on the younger animal population of the area. Pig, as might be expected, have the youngest population profile. Unless boars and sows are held back for reproduction, pigs are prime for meat production by 8-10 months of age. Piglets were also favored. From a sample of 31 instances where some teeth staging could be made by eruption sequence, 5/31 or 16% were less than six months old. The drop off in age profile by the 24-30 months stage is sharp and continues to fall precipitously through the next and oldest stage of epiphyseal maturity for pigs.

The sheep/goat profile is clearly more mature than pigs, and slightly more mature than the cattle profile, although it too is a young population in comparison to traditional rural profiles. Both sheep/goat and cattle profiles indicate a slight peaking in their most mature stages which means that mutton and beef were certainly eaten.

The age profile of both sheep/goat and cattle raises questions about how urban demand for meat may have structured or competed with wool and diary production in the local area. The sheep age profiles would be counter-productive to wool production (cf. DeVoe 1862:151). Competition between dairy herds and meat herds is more complex for cattle. Young males are culled early in dairy production systems and old cows provide a source of mature meat. The degree to which oxen may have been used as work animals during this time also requires investigation, since the production of work

Faunal Table 4.68 175 WATER STREET: Percentages of Epiphyseal Fusion for Different Age Stages of Three Species (based on Faunal Tables 4.27, 4.28, 4.29)

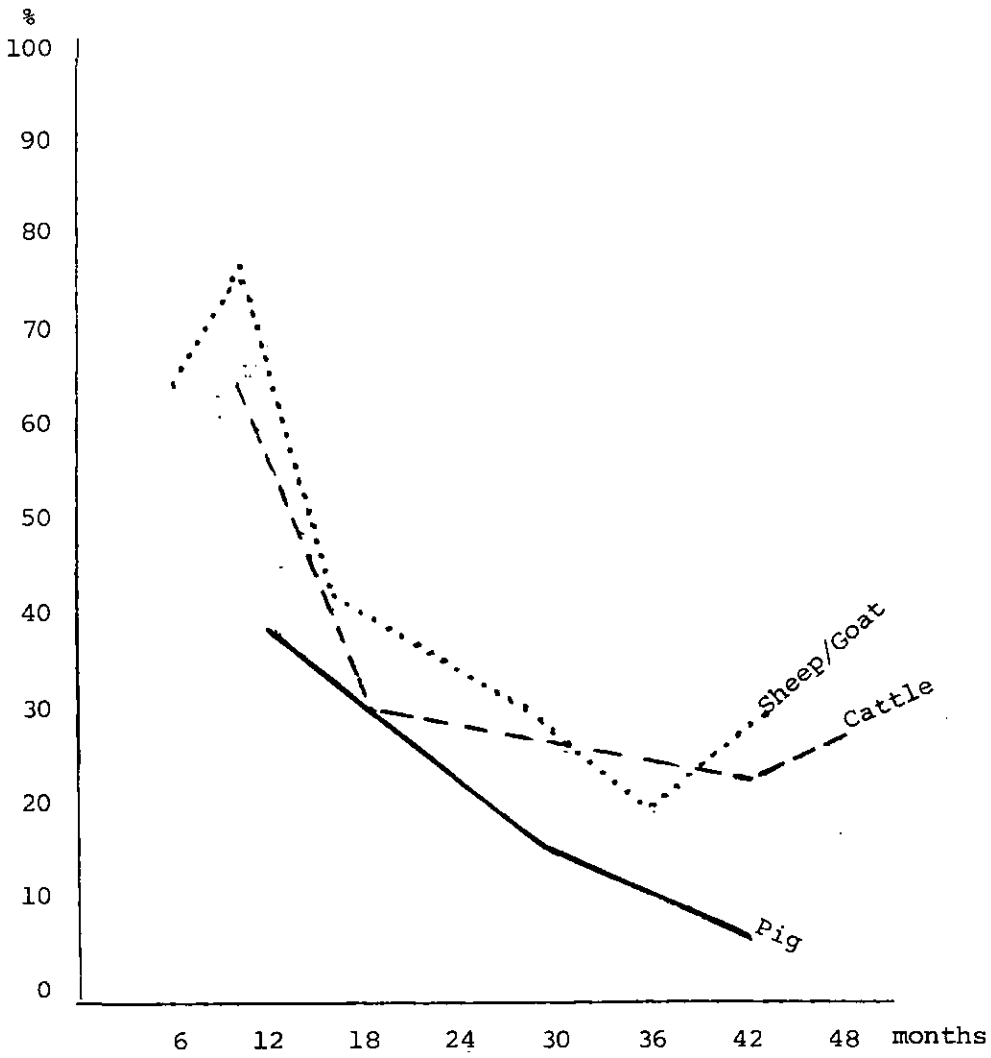
Modern age stage (months)	Pig epiphyses +	-	% fused (+)	Modern age stage (months)	Sheep/Goat epiphyses +	-	% fused	Modern age stage (months)	Cattle epiphyses +	-	% fused
12	10	15	40	6-10	20	12	62.5	7-10	28	15	65.1
24-30	6	33	15.4	10	30	9	76.9	12-18	13	30	30.2
36-42	1	14	6.6	13-16	21	27	43.7	24-36	6	19	24.0
				18-28	17	37	31.5	36-42	7	23	23.3
				30-36	12	47	20.3	42-48	10	27	27.0
				36-42	14	33	29.8				

Faunal Table 4.69 175 WATER STREET: Epiphyseal Fusion Record for Pig

	41	42, 43, 46	49	27, 28	2	51	50	48	1	32	44, 45	47
SCAP				0 1		0 1	0 1		1 0			
DHUM			1 0				0 1					
PRAD			1 0	1 0							1 0	
PELVIS	0 1			0 1	0 1		0 1					
II PH		1 0	3 3	0 2	0 1	1 1						1 0
STAGE-12m												
10 15												
40%												
MC												
IPH		1 2	0 6	0 1	0 1			1 0				
DTIB		1 2								0 1		
CALC	0 1	0 2										
MT							0 1					
DFIB												
METAPODIA	1 5	1 4	0 3	1 0	1 1	0 1		0 2				
15.4%												
PHUM		0 1	0 1									
DRAD												
ULNA			0 1		0 1							
PFEM	1 1	0 1					0 1					
DFEM		0 2	0 2		0 1							
PTIB	0 1			0 1								
PFIB												
1 14												
6.6%												
TEETH	6m	6-12m	1m	2m		15-18	15m		6-9m		15-18	
	6-9m	22m	7-13				24m					
	12-16(2)	4-6	16	12-16m			9m					
	12-16	8-13	15-18				12-16					
	12-16m	12-16		15-18m								
		15-18 (4)										
				12								
				9-10								

Figure 4.12
175 WATER STREET

Fauna
Ageing by Grouped Epiphyseal Fusing



Based on Faunal Table 4.26

Faunal Table 4. 70 175 WATER STREET: Epiphyseal Fusion Record for Sheep/Goat

	41	42, 43, 46	49	27, 28	2	51	50	48	1	32	44, 45	47
SCAP				3		1 0	1 0	2 0				
PELV	12 5		0 4	1		0 1						1 1
20 12												
62.5												
DHUM	9 4	4 0	2 0	3	1 0			0 1			2 0	
PRAD	5 2	1 0		2	0 1	0 1						1 0
30 9												
76.9												
I PH	3 3	4 5	0 1			0 1	1 0		4 4	1 1	1 1	
II PH	1 0	2 2	0 3	1	0 1	1 2	0 1		1 2		1 0	
21 27												
43.7												
DMC	2 5	0 2	2 0		0 2	0 1	3 0	1 0				
DTIB	6	2 0		2	1 2		0 1	0 3	1 2		0 1	
DMT		1 1	0 2		1 0				1 0			
METAPODIA		1 2		1	0 2				0 3			
17 37												
31.5												
OLEC	2	1 1	0 1		1 1			0 1				
CALC	9	1 4	1 2	4	1 1		0 1		1 0			
PFEM	1 10	0 2	3 2	1 1	1 1	0 1		0 1	0 1	0 1		
12 47												
20.3												
DRAD	5		1 0	1	1 0	0 1		0 1				1 0
PHUM	3			1			0 1					
DFEM	2 5	2 1	1 3	1 1					1 0			
PTIB	4		1 2	3		0 1		0 1	2 0			
14 33												
29.8												
TEETH	(2) 18-24	3m			5-6m	18-24	24-30			36m		
	(1) 24	18-24			21-24							
	(1) 21-24											

Faunal Table 4.71 175 WATER STREET: Epiphyseal Fusion Record for Cattle

	41	42, 43, 46	49	27, 28	2	51	50	48	1	32	44, 45	47
SCAP	1 1	2 0	0 1	2		(1) 1						
PELV	18 2	0 2	2 3	3	0 4	0 1						
7-10 months												
2 15												
DHUM	0 5	2 0	0 1	1 1								
PRAD	0 6	2 0	0 1	2 0	1 0			1 0				
I PH	2 0	0 2	0 2	0 0			0 1					0 4
II PH	1 2	1 0		0 2		0 1					0 1	0 1
12-18 months												
13 (30.2) 30												
DMC	2 1						0 1			1		
DTIB	0 2	2 2	1 2		0 3	0 2						
DMT												
METAPODIA		1 1	0 3							1		
24-36 months												
6 (24) 19												
CALC	0 7	1 2	0 1	0 1	1 2	0 1	1 0					
PFEM	2 2	1 2	1 0	0 1		0 4						
36-42 months												
7 (23.3) 23												
DRAD	0 3	1 1		0 1		0 1	3 0		1 0			
PHUM	0 5					0 1						
OLEC	0 1			0 1			1 1					
DFEM			0 5		1 0	0 1			1 0			
PTIB		1 2	1 2	1		0 1						
42-48 months												
10 (27) 27												
TEETH			no info	2m	25-30	2m	18-25		25-30	28-36		
		5-6m			4m		24-30					
					2m					25-30		

animals is another complication source of competition for diary and meat production. The interaction between the Manhattan market and the structure of regional pastoral husbandry in the late-eighteenth century requires investigation for deeper insight into how specialization worked.

The age profiles for piglets, lamb, veal, and older mutton and beef suggest a seasonal economics of meat consumption. Some insight into seasonal pricing and availabiltity of meat may be gained by examining maximum prices set for meat at the public market of New York in 1763 (DeVoe 1862). Before turning to this data, it must be remembered that such price fixing reflects more of a moral economy that a real, competitive one. Research into suits brought against butchers and retailers for offenses against the moral economy -- stock-piling, flooding the market, price gouging--will help to balance and idealize a picture of price setting with the dynamic of marketing transactions. Household and institutional accounts will also help to set up a real price structure to be compared with the moral one. The extent to which imported meat (most likely conserved) influenced the market also needs to be considered in order to sort out micro- and macro-processes at work in the New York meat markets. Meat prices undoubtedly fluctuated with the seasonal availability of alternative bird, fish, and mollusc food sources.

The 1763 price rates (maximum) for different meats are plotted in Figure 4.13. Veal was available all year round but it was cheapest during the spring and summer months when the bulk of young calves would have been born and weaned. Both beef and veal shared the same maximum price during these months suggesting that beef production and veal production were not in competition or were being manipulated so as not to be. If economizing was a consideration for the consumer, it made greater sense to buy beef in the winter than veal. Beef was the cheapest choice of meat in the winter months.

Early spring lamb was the luxury meat, or again, it was manipulated as a luxury item. In this respect it is interesting to note that the sheep population at 175 Water Street is slightly older than cattle, with few younger animals. A combination of very young lamb with very young piglets might have indicated a consumer who didn't need to or preferred not to economize in this area of the diet.

The price structure of pork may help to explain its low representation at the 175 Water Street site. It cost more than beef and veal in the spring and summer months and slightly more than beef in the winter. Pork and mutton cost the same from March until June when they traded off in their relative expensiveness from July to October. Relatively speaking, pork was not cheap. What pork was being marketed? Did the pork being raised inside the city pass through the market, or were they butchered and processed at the household level? Was city pork more disease ridden (Edwina Gluck 1982: personal communciation)? Did conserving meat help to minimize this health problem? Did younger piglets present less of a risk of infestation to the consumer? The ecology of pig keeping and eating in the city requires further investigation.

Butchery

The discussion on skeletal element frequencies above provides a necessary background to an examination of butchery processes. This section will begin on a practical note with recommendations on how butchery traces should be coded in a computerized archive.

When research began on the 175 Water Street material, it was unclear whether the corpus of frequent cut patterns published by R. Lee Lyman (1977) and based on material from the Fort Walla Walla dump site dated to 1903, would apply to the earlier material of the late-eighteenth century from 175 Water Street. Several critical technological factors in the development of the meat industry intervene chronologically between the two samples. These include the introduction of cooling systems in the 1860s and the refrigerated railroad car in the 1880s; the development of the oblong tapered tin can in the 1870s and increased sophistication in butcher's meat saws by the end of the nineteenth century.

Analysis of the 175 Water Street sample, in fact, demonstrated that, in spite of the lack of these mid to late-nineteenth century innovations, the basic repertoire of cuts as illustrated by Lee Lyman are observable in the late-eighteenth to early-nineteenth-century material. Saw cuts among cattle bones are missing only from Feature 50 and from the smallest sample sizes of Features 47, 45, 46, and 32.

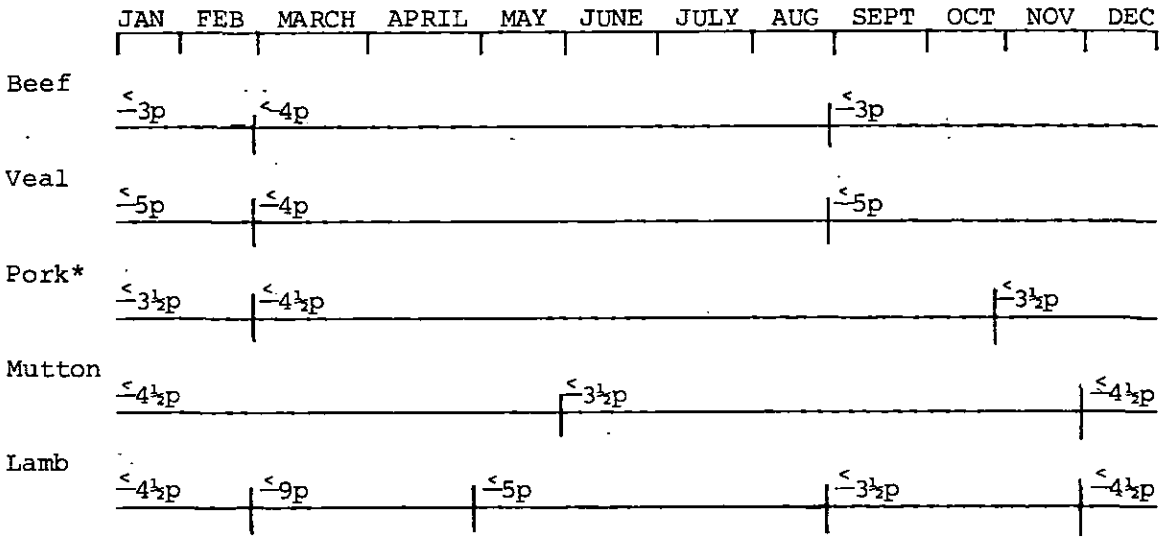
I propose that Lee Lyman's illustrations be coded under the ALTERATIONS category of the computer system as a short-cut to indicating the most commonly occurring cut marks. This will allow for standardization of comparisons. Variations of cuts not found in his article may be entered manually, photographed, and added to the computer code if they occur with enough frequency to constitute a pattern.

In discussing butchery traces, an area which presents great scope for future comparative research is the determination of whether or not larger wholesale cuts or smaller trimmed cuts are characteristic of different features. Such a determination provides an interesting starting point for reconstructing the nature and scale of the consumption units that presumably disposed the material and may help to distinguish between consumption units that were not coincident with household units. Differences may also reveal different steps and spatial diversity in garbage disposal rather than differences in the consumer unit.

Feature 41, a privy, and the grey (F27) and orange (F28) living floors (abbreviated as LF) will be used to explore these questions for cattle butchery. Feature 41 has the largest sample size of major domesticates and revealed abundant evidence for large-scale butchery activity. This feature seemed worthy of special study and the living floors of Lot 33 were chosen as a likely source of good contrast with Feature 41. The samples from the two living floors have been aggregated since they are statistically similar in both species and skeletal composition for pig, sheep/goat, and cattle respectively.

The data for butchery traces in Feature 41 appear in Faunal Table 4.72 and those for the living floors in Faunal Table 4.73. The butchery cuts have

Figure 4.13 **Fauna**
175 WATER STREET **New York City Meat Prices, 1762**



Based on Devoe (1862) all prices in pence per pound
*roasting pigs 5p (no seasonality)
≤ less than or equal to

been keyed to the Lee Lyman (1977) illustrations and are further illustrated by two plates in this report.

It is clear that the remains of large-scale processing of hind and forequarters of cattle is present in Feature 41. The steps in trimming the hindquarter are especially well preserved. The pelvis was cut into rump roast as acetabular, ischium, and femur fragments demonstrate. It is possible that the further cross-section in the acetabular area (see Plates 4.47 and 4.48) resulted in the deboning for rolled rump. This conjecture has to be checked with a butcher. The ilium was sawn into at least three pieces indicating refined retail cuts of the sirloin. In one instance sections of the ilium actually fit together. These retail cuts of the sirloin are known today as sirloin and pinbone sirloin steak. The short loin was left after the ilium had been separated. This was also trimmed into retail cuts such as porterhouse, T-bone, and club steaks.

The sectioned anterior portion of the sacrum occurs in Feature 41 material, along with abundant remains of caudal vertebra ("tail"). These elements support the conjecture that the entire hindquarter was initially present before trimming into retail cuts (for pictures of wholesale and retail cuts see Ashbrook 1955).

The sawing and chop-traces on the scapula indicate that the forequarter was present and heavily processed in Feature 41 as well. The forequarter provides brisket, stewing, soup, and knuckle cuts. A mixture of veal and beef is present in Feature 41. It is difficult to distinguish butchery on the young material which is composed largely of epiphyses rather than the long-bones themselves.

The question remains whether a whole side of beef (forequarters, rib section, and hindquarter) was purchased and then processed. It is a strong possibility, but it is difficult to prove. The ratio of carpals/tarsals, metapodia, and phalanges, including a "hoof burial" complete with hoof sheath, tends to suggest this.

Feature 41 presents us with ambiguities. Although the material represents units of beef, they were subsequently trimmed into the most refined retail cuts. What kind of consumption unit does this represent? An examination of all the material in the privy is necessary in order to shed light on this question.

The living floors in Lot 33 (F27 and F28) present another picture. The forequarter elements of cattle displaying butchery traces are composed of shank portions suitable for soups. Likewise, the hindquarter cuts are from the hind shank, also suitable for soups.

This constellation of material may reflect the following processes:

(1) That only soup bones, rather than the larger remains of roasts, were disposed of on the living floor.

(2) That larger bones were removed by carnivores. This may be disproved by the gnawing rate for cattle bones which is very low for

the living floors, 1.3% (1/75), and higher for Feature 41, 4.3% (14/326).

(3) That larger pieces of cattle bone offered greater surface area to be broken in trampling on the living floor, and, therefore, smaller bone having a better chance of survival. This assertion could be checked against the preservation of fish and bird bone. For identifiable cattle bone weathering and erosion was not characteristic (Living Floor 2/75 = 2.6% and compares well with Feature 41 31/326 = 9.5%), although over 200g of very fragmented bone was recovered in the living floor sample.

(4) That the living floor represents an archaeological reality and that soups and stew constituted the type of beef selected by the consuming unit that presumably disposed of the bone material on the living floor.



Plate 4.47: Acetabular cut (not illustrated in Lee Lyman)

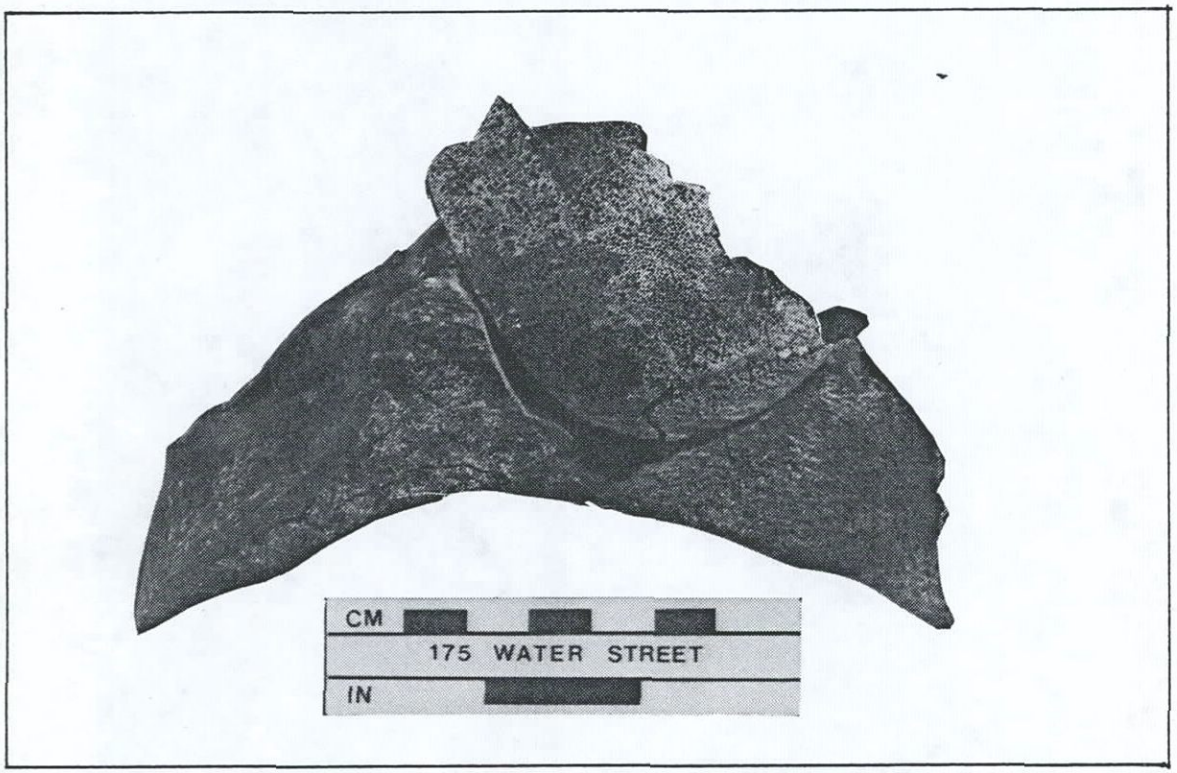


Plate 4.48: Extension of acetabular cut illustrated in Plate 4.47 with femur head.

Faunal Table 4.72 175 WATER STREET: Butchery Traces on Cattle Bones in Feature 41

HINDQUARTER

Lee Lyman (1977) Key	Frequency of Occurrence
PELVIS	
Ilium	
4a	3
4b	8
	5 unfused juvenile
Ischium	
4b	2
4e	2
	1 gnawed juvenile--pattern unclear
Acetabulum + Ischium	
4a	1
	3 unfused juvenile
Acetabulum + Ilium	
4c	1
	1 no information on butchery pattern
Acetabulum + Pubis	
	1 cut on inner edge of pubis (not illustrated)
Acetabulum + Ilium + Pubis	
4c	1
	1 fig. in photographic record
RIBS	
Femur	
6a	1 immature
6b	1 immature
6c	1
	5 juvenile epihyseal and shaft portions
Tibia	
	3 juvenile epiphyses and shaft portions
8h	1
8h?	24 juvenile - chop ax/butchery trace not clear
	no comment - head and neck

Faunal Table 4.72 (continued)

8h, i, j, k, l m	sawn shaft portions 5 shaft portions without comment 11
VERTEBRA	
9a	14
9d	4
9c	1
	5 other
	1 complete
(thoracic)	
	5 simply cross-sectioned
9g	1
9h	1
9 f,g	4 (spine)
(lumbar)	
	7 cross-sectioned
9m	10
9m	4 posterior process only
9l	4 transverse process
(sacrum)	
p, q, r	5 anterior process
FOREQUARTER	
scapula	
1b	1
1c	1
1f	2
	4 glenoid and blade from calf butchery unclear
humerus	
2a	2
2d	2
2e	1
	2 prox. epiphyses
	3 dist. epiphyses
	4 shaft fags from calves
radius	
3g	1
3m	1
	1 cross-sectioned distal ephiphysis not illustrated in Lee Lyman
	6 from proximal area--calves
	2 distal area--calves
	shaft--calf
ulna	
	3 juvenile fragments

Faunal Table 4.73 175 WATER STREET: Butchery Traces on Cattle Bones from the Living Floors (F27 and 28) of Lot 33

HINDQUARTER

Lee Lyman Key	Frequency of Occurrence
PELVIS	
Ilium	
4b	3
6e	1 shaft
Femur	
6e	1 shaft
Tibia	
7a	1
RIBS	
8i	2
8j	1
8h	2
8 h-m	6 shaft portions + 6 without comment on butchery 1 head and neck without comment
VERTEBRA	
(cervical)	
9c	1 1 unknown
(thoracic)	
	1 cross-sectioned
9g	1
9f,g	4 spine 1 centrum
(lumbar)	
9m	5
9m	1 posterior process
sacrum 9r	1 negative portion
FOREQUARTER	
scapula	
	1 juvenile

Faunal Table 4.73 (continued)

humerus	
2b	1
radius	
3h	1
	1 proximal area with green break
	1 juvenile shaft
ulna	
3b	1

PHOTOGRAPHIC RECORD OF SOME COMMONLY OCCURRING BUTCHERY TRACES - CATTLE

Description Lee Lyman (1977) Key	Occurs in 175 Water Street Feature	Plate Number in text
8h with secondary sharp knife traces	20.6.006	-
cranial-caudal sectioned vertebra	19.3.018	-
9h- cattle thoracic vertebra-cranial and caudal view	36.1.002	-
4b- illium sections cranial and caudal view of saw cuts	22.2.002	-
4b- illium sections that fit together	22.2.003	-
not illustrated in Lee Lyman- acetabular cut	22.2.002	Plate 4.47
extension of cut in Fig. 9 with femur head	22.2.002	Plate 4.48
4c	22.2.002	-
6c	22.2.002	-
6a (head portion)	22.2.002	-
6i	29.6.006	-

Patterning at the Feature Level

So far the aggregate archaeozoological sample has received attention. This level of information forms the core for intersite comparisons. How reflective is aggregated data of patterning at the feature level? In order to set up an interim analysis of this problem, a series of chi-squares tests was made for relative species composition of the major domesticates, skeletal composition for each of these species across each of the features and, the skeletal composition of sheep/goat and cattle within features were studied. Diversity was expected from the outset, and the tests, which will be discussed below, confirm it. The diversity raises broader questions for the task of synthesis. Is such diversity reflected in ceramic and glass samples, or is it peculiar to the bone sample? Are there temporal or functional interrelationships among the characteristics of the faunal, glass, and ceramic data that might be tested by discriminant analysis to determine what variables play an important role in clustering different features into a "group membership"? Finally, how may this synthesis be related to the historical record for the social and economic patterns of occupancy of the lots through time?

Species Composition

The frequencies for pig, sheep/goat, and cattle bones in each feature have been compared across all other features in a series of chi-square tests. The results appear in Faunal Table 4.74. The largest sample sizes are worth examining since the chi-square statistic is dependent on sample size. Of the four largest features-- the privy F41, the disturbed privies and drain, F42, 43, 46, the box/cofferdam F49, and the living floors of Lot 33 (F27 and F28) -- only one pair of features is similar in species composition: F42, 43, 46 (as one unit) and Feature 49. The critical factor contributing to their similarity is their large pig sample. However, as we shall see later, the composition of their pig samples is different. Feature 49 has very high podial frequencies for pig and F42, 43, and 46, the disturbed privy has high cranial frequencies. The high frequency of pig in these two features and the "scrappy" nature of the skeletal sample makes one wonder if the similarities they share is one of secondary disposal of scraps. The podial rating for sheep/goat are also high in both features, further confirming this pattern. On the other hand, they both share high edible frequencies for the skeletal sample of cattle. In summary, the similarities are ambiguious. The living floor of Lot 33 and the privy in Lot 22 (F41) are dissimilar in species composition. There is less pig in Feature 41 and more sheep from the living floors. Interestingly enough, these two features are similar both in the skeletal composition of their pig samples and in their sheep/goat samples in spite of the different proportions of abundance of these animals. The cattle samples are dissimilar in skeletal composition. Feature 41 has an unusually high edible representation for its skeletal cattle sample.

Privies tend not to look more similar to each other than any other features in terms of species composition. The effect of sample size is clear in the smaller samples. They tend to look like each other largely because the computed value of chi-square has smaller chances of taking on different values in small samples. The conclusion that may be drawn here is that

smaller sample sizes yield little predictive information and sampling might be best concentrated on in-depth analysis of features with larger sample sizes. Such a strategy requires accurate field estimates of bone sample size.

Skeletal Composition

The composition of skeletal element frequencies for pig, sheep/goat and cattle has been tested by grouping skeletal elements into cranial, edible, and podial categories (see above). Other categories may certainly be devised such as cranial, forequarter, vertebra and ribs, hindquarter, and podial. Sample size, however, is again a problem and the three categories allow for larger cells more suitable for chi-square tests. If Faunal Tables 4.75, 4.76, and 4.77 are compared, it can be seen at a glance that diversity is the rule, especially among the larger statistically more reliable samples.

A feature which is similar in species composition may be dissimilar in the skeletal composition for each species (e.g., F50 and F42, 43, and 46). Features which are dissimilar in species composition (F41 and F2) may also be completely different in skeletal composition--a case of total dissimilarity. The living floors of Lot 33 share similar skeletal compositions for pig and sheep with the other three largest features, although they differ from all three in species composition (F41, F42, 43, 46, and F49).

The comparisons of skeletal composition for sheep/goat and cattle within each feature was constructed to see when they were similar, since it was expected that they would be different. Their carcasses were handled differently in butchering, and cuts were trimmed out differently as well. In fact, there was less variation than expected. Seven out of twelve features showed no real difference in the skeletal composition of sheep/goat and cattle suggesting that the material represents selected garbage. The variability that is encountered occurs in the largest features by sample size. Out of the four largest features, only F41 has similar skeletal composition for sheep/goat and cattle. This feature is marked by its unusually high rating of edible parts and this deposit seems to be highly selective (see Faunal Table 4.78).

Faunal Table 4.74 175 WATER STREET: Chi-Square Matrix--Species Composition

FEATURE	41			42, 43, 46			49			27, 28			2			51		
SPECIES	43	338	326	75	109	152	44	72	95	24	108	75	32	76	91	14	72	72
Percentage	6	48	46	22	32	45	22	34	45	12	52	36	16	38	46	9	46	46
41	--			65.7 VS			15.9 VS			10.8 S			21.9 VS			1.6 NS		
42, 43, 46	--			--			1.3 NS			23.05 VS			2.1 NS			15.9 VS		
49	--			--			--			15.4 VS			1.7 NS			11.3 S		
28, 29	--			--			--			--			8.1 W			3.4 NS		
2	--			--			--			--			--			4.7 NS		
51	--			--			--			--			--			--		
50	--			--			--			--			--			--		
48	--			--			--			--			--			--		
1	--			--			--			--			--			--		
32	--			--			--			--			--			--		
44, 45	--			--			--			--			--			--		
47	--			--			--			--			--			--		

(continued)

Faunal Table 4.74 175 WATER STREET: Chi-Square Matrix--Species Composition (continued)

FEATURE	50	48	1	32	44, 45	47
SPECIES	19 35 43	14 41 28	12 45 21	2 17 19	8 13 11	2 6 10
Percentage	20 36 44	17 49 34	15 58 27	6 45 50	25 41 34	11 33 55
41	22.7 VS	14.5 VS	15.9 VS	.229 NS	17.1 VS	1.8 NS
42, 43, 46	.573 NS	8.3 W	17.4 VS	6.5 W	1.46 NS	1.4 NS
49	.133 NS	5.9099 NS	13.3 S	5.4 NS	1.3 NS	1.2 NS
28, 29	7.7 W	1.5 NS	2.4 NS	3.1 NS	4.5 NS	2.8 NS
2	.57 NS	3.8 NS	9.8 S	3.1 NS	2.1 NS	.71 NS
51	6.7 W	5.0 NS	8.2 W	.62 NS	6.9 W	.98 NS
50	--	3.3 NS	8.4 W	4.3 NS	1.04 NS	1.04 NS
48	--	--	1.2 NS	4.6 NS	1.2 NS	3.0 NS
1	--	--	--	6.9 W	2.8 NS	5.5 NS
32	--	--	--	--	5.8 NS	1.0 NS
44, 45	--	--	--	--	--	2.5 NS
47	--	--	--	--	--	--

KEY x^2 5.991(.05)2df=W x^2 9.210(.01)2de=S x^2 13.815(.001)2df=VS
x^2 5.991(.5)2df=NS

Faunal Table 4.75 175 WATER STREET: Pig Skeletal Composition

FEATURE	41			42, 43, 46			49			27, 28			2			51		
C/E/P	18	13	12	30	27	18	4	15	25	6	11	7	3	17	12	2	6	6
Percentage	42	30	28	40	36	24	9	34	56	25	46	29	9	53	38	14	43	43
41	--			.455			1.9			2.3			9.8			3.5		
				NS			NS			NS			S			NS		
42, 43, 46				--			17.6			1.8			9.9			3.87		
							VS			NS			S			NS		
49							--			5.8			3.01			.889		
										NS			NS			NS		
27, 28										--			9.5			.984		
													S			NS		
2													--			.493		
																NS		
51																--		
50																		
48																		
1																		
32																		
44, 45																		
47																		

(continued)

Faunal Table 4.75 175 WATER STREET: Pig Skeletal Composition (continued)

FEATURE	50			48			1			32			44, 45			47		
C/E/P	4	14	1	1	9	4	5	7	0	0	1	0	3	3	2	0	1	1
Percentage	21	74	5	7	64	29	42	58	0	0	100	0	38	38	25	0	50	50
41	10.5 S			6.9 W			5.4 NS			2.2 NS			9.1 W			1.4 NS		
42, 43, 46	9.1 W			6.1 W			4.2 NS			1.7 NS			7.8 W			1.4 NS		
49	14.6 VS			4.1 NS			14.5 VS			1.85 NS			10.9 S			.337 NS		
27, 28	4.7 NS			2.1 NS			4.5 NS			1.128* NS			3.2 NS			.767 NS		
2	6.9 W			.494 NS			9.5 S			.859 NS			4.1 NS			.268 NS		
51	6.8 W			1.3 NS			7.3 W			1.22 NS			4.3 NS			.327 NS		
50	--			.134 NS			1.9 NS			.351 NS			.487 NS			4.36 NS		
48				--			6.8 W			.535 NS			1.9 NS			.457 NS		
1							--			.615* NS			3.23 NS			6.9 W		
32										--			.377 NS			.666* NS		
44, 45													--			2.27 NS		
47																--		

*Fisher's exact test

Faunal Table 4.76 175 WATER STREET: Sheep/Goat Skeletal Composition

FEATURE	41			42, 43, 46			49			27, 28			2			51		
C/E/P	14	277	47	14	53	42	2	47	23	1	88	20	10	55	11	2	55	15
Percentage	4	82	14	13	49	39	3	65	32	1	82	19	8	72	15	3	76	21
41	--			47.47 VS			13.68 S			3.65 NS			9.42 S			2.39 NS		
42, 43, 46				--			7.67 W			27.76 VS			13.37 S			14.88 VS		
49							--			.566 NS			10.09 S			2.31 NS		
27, 28										--			12.09 S			1.15 NS		
2													--			5.84 NS		
51																--		
50																		
48																		
1																		
32																		
44, 45																		
47																		

(continued)

Faunal Table 4.76 175 WATER STREET: Sheep/Goat Skeletal Composition (continued)

FEATURE	50			48			1			32			44, 45			47		
C/E/P	2	19	14	3	29	9	0	21	24	2	6	7	0	8	5	0	5	1
Percentage	6	54	40	7	71	22	0	47	53	12	36	41	0	62	39	0	833	17
41		16.45			2.99			41.52			15.90			6.27			.282	
		VS			NS			VS			VS			W			NS	
42, 43, 46		1.39			5.87			7.43			.429			2.05			2.85	
		NS			NS			W			NS			NS			NS	
49		1.44			2.25			6.05			5.09			.526			.857	
		NS			NS			S			NS			NS			NS	
27, 28		10.68			5.15			19.27			16.14			2.95			.069	
		S			NS			VS			VS			NS			NS	
2		9.33			1.69			23.64			8.52			5.45			.899	
		S			NS			VS			W			NS			NS	
51		5.40			1.34			13.79			8.63			2.14			.248	
		NS			NS			S			W			NS			NS	
50		--			2.91			3.54			1.30			.837			1.84	
					NS			NS			NS			NS			NS	
48					--			10.94			4.45			2.11			.623	
								S			NS			NS			NS	
1								—			6.21			.892			.857	
											W			NS			NS	
32											--			2.49			3.35	
														NS			NS	
44, 45														--			.347*	
																	NS	
47																	--	

Faunal Table 4.77 175 WATER STREET: Cattle Skeletal Composition

FEATURE	41			42, 43, 46			49			27, 28			2			51		
C/E/P	12	276	38	18	113	21	2	82	11	10	51	14	19	61	11	6	54	12
Percentage	4	85	12	12	74	15	2	86	12	13	68	19	21	67	12	8	75	17

41	--	12.75 S	.5733 NS	14.74 VS	31.05 VS	4.66 NS
42, 43, 46		--	8.13	1.13 NS	3.60 NS	.834 NS
49			--	10.71 S	16.76 VS	.473 NS
27, 28				--	2.53 NS	1.17 NS
2					--	5.08 NS
51						--
50						
48						
1						
32						
44, 45						
47						

(continued)

Faunal Table 4.77 175 WATER STREET: Cattle Skeletal Composition (continued)

FEATURE	50			48			1			32			44, 45			47		
C/E/P	8	28	7	3	23	2	1	15	5	4	12	3	2	7	2	0	2	8
Percentage	19	65	16	11	82	7	5	71	24	21	63	16	18	64	18	0	20	80
41		18.04			3.49			2.82			12.93			6.32			38.37	
		VS			NS			NS			S			W			VS	
42, 43, 46		1.68			1.04			2.08			1.45			.634			28.04	
		NS			NS			NS			NS			NS			VS	
49		13.3			4.38			2.79			42.05			7.70			28.59	
		S			NS			NS			VS			W			VS	
27, 28		.619			2.42			1.29			.729			.1899			17.42	
		NS			NS			NS			NS			NS			VS	
2		.472			2.37			4.17			.205			.337			27.37	
		NS			NS			NS			NS			NS			VS	
51		2.70			1.57			.757			2.51			1.14			19.16	
		NS			NS			NS			NS			NS			VS	
50		--			2.48			2.43			.050			.023			16.41	
					NS			NS			NS			NS			VS	
48					--			3.03			2.15			1.63			20.26	
								NS			NS			NS			VS	
1								--			2.54			1.55			8.84	
											NS			NS			W	
32											--			.052			11.75	
														NS			S	
44, 45														--			.835	
																	NS	
47																	--	

Faunal Table 4.78 175 WATER STREET: Comparative Skeletal Composition for Sheep/Goat and Cattle within Features Based on Cranial, Edible, and Podial Characters

Feature #	Lot and Unit	X^2 value at p. (.05) 2 df
41	22.02	0.892
42, 43, 46	21.01/.03	22.719
49	20.06	10.768
27, 28	Living Floors (33)	12.413
2	33.05/.07	1.770
51	18.02	2.343
50	19.03	6.909
48	20.02	2.797
1	36.01	6.593
32	23.05	3.849
44,45	21.01/.04	3.208
47	20.05	.02448 (Fisher's exact test)

Faunal Table 4.79 175 WATER STREET: Pig Alterations, Aggregate

	BURN					DIS	GNW	BUTCHERY						NATALT					BRKG		
	PBRNT	WHTE	CARB	PWHT	PCARB	Dis.	GNAW	CHOP AX	DULL BLOW	SHRP KNFE	SAW	SAWF	SAWO	ACID	H2O WEAR	FE PAN	WEAT	METAL STAIN	GREEN	MOD	POST DEP
horn core/antler																					
skull								3		1											
maxilla																					
mandible								3		2					1		1				
teeth																					
vertebrae							1	8		1											
ribs							2			2								1		1	1
scapula		1					1	1	3	4	1						1				1
humerus							2		1	3											2
radius								2									4				1
ulna																					
MC																					
pelvis							1	3		2							4			1	
femur										3	1						2				2
tibia							1			2					1		2			1	6
carpals/ tarsals							2	1							2		1				
MT																	1				
MP	1	2			1		2			2							2				2
PHALANGES							3	1		1							2				

Faunal Table 4.80 175 WATER STREET: Sheep/Goat Alterations, Aggregate

	PBRNT	WHTE	CARB	PWHT	PCARB	Dis.	GNAW	CHOP AX	DULL BLOW	SHRP KNFE	SAW	SAWF	SAWO	ACID	H2O WEAR	FE PAN	WEAT	METAL STAIN	GREEN	MOD	POST DEP
horn core/antler																					
skull								1		1											
maxilla																	1				
mandible								1		1											
teeth																					
vertebrae		1					6	50	1	9					1	1	7	1		2	1
ribs				1			3	6	1	15					1		4			6	1
scapula							4	1	4	1					1		4			1	
humerus								2		3							3			1	13
radius							2	3									2				4
ulna				1				2		2					1						
MC							2										8				7
pelvis				1	1			9	2	3	1				1		3			1	
femur							2	2	2	7	2						4				5
tibia				1			4	5	4	5	1						5				17
carpals/ tarsals							2	5		2	2				1		6				1
MT							1	1	1	1							5				9
MP	1	1		1					1	1							4				1
PHALANGES							2								1	1	9				
	B U R N					DIS	GNW	B U T C H E R Y						N A T A L T					B R K G		

Faunal Table 4.81 175 WATER STREET: Cattle Alterations, Aggregate

	PBRNT	WHTE	CARB	PWHT	PCARB	Dis.	GNAW	CHOP AX	DULL BLOW	SHRP KNFE	SAW	SAWF	SAWO	ACID	H2O WEAR	FE PAN	. WEAT	METAL STAIN	GREEN	MOD	POST DEP
horn core/antler								1													
skull					1		1	3	1								2			1	
maxilla																					
mandible							1	3	2	1							1				
teeth							1	2													
vertebrae							6	77	29	11	22				1	2	34			4	1
ribs			2	1			10	30	12	25	52				1	1	18	2		4	5
scapula				2			1	3	3		6					1	5			1	
humerus			1				1	6	3	2	0						3		2		7
radius							3	7	3	2	2						5		4	1	8
ulna						1	3	4	1								1				
MC							1			1							3				1
pelvis					2		6	15	3	5	27						3			4	
femur							3	9	2	10	10						5		1	3	5
tibia							1	3	1	2	3						3	1		1	10
carpals/ tarsals							5	5	0	1						1	10			1	
MT																					2
MP																					
PHALANGES																	1				
TOTAL								168	60	60	122										

B U R N | DIS | GNW | B U T C H E R Y | N A T A L T | B R K G

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FLORAL ANALYSIS

The analysis of floral material from the 175 Water Street site is divided into two sections. The first, a micro-floral analysis, comprised an analysis of mircoscopic seeds from selected flotation samples; the second includes the larger pits and seeds or macro-floral data available from all the features at the site.

The micro-floral analysis completed by Roberta Taylor, a floral expert, will be presented in its entirety. Since it mainly represents a sample from two privies (Features 2 and 41), the data cannot be considered representative of the site; instead, it should be viewed as an indication of the kinds of plants and food items available to mid- to late-eighteenth century New Yorkers and to the occupants of the site through the middle of the nineteenth century. It also indicates some of the medicinal plants that may have been utilized, and suggests the site's proximity to water. Included in the micro-floral report is a description of relevant floral species recovered during excavation.

Comparable information is derived from the site's macrofloral material, but this is presented in less detail. Here, too, the availability of a relatively comprehensive range of flora is documented, and again, the proximity of the site to water is suggested. While the macro-floral analysis potentially included material from all the site's features, it will be seen that not all features and feature levels are represented in the sample. Whether this is an effect of sampling or an actual lack of these data in many features remains an unknown. The available data, however, provided feature specific information of interest, and in general suggests the availability of a wide range of floral material to New York's early inhabitants whose domestic trash is part of the primary landfill that made the block, and to the occupants of the site after the block was developed.

Micro-Floral Analysis
(Roberta Taylor)

Eighteen samples of floral material retrieved mainly from two privy features (F41.1 and F2.2; one sample each from F3.9, the original fill below a cistern, and F8, a wooden floor, were also analyzed) from the 175 Water Street site in Lower Manhattan were analyzed for this report. Nine samples (Lot 22) were received pre-sorted with the macro-flora removed, and needed only identification. Nine additional samples (Lot 33) had only been sieved (2mm., .85mm., .425mm) and had to be sorted and identified.

This report pertains only to a sample of micro-flora from Lots 22 and 33 and does not relate information regarding macro-flora removed and/or identified prior to this analysis or to floral remains from any additional features.

The majority of plant species recovered in this seed analysis were woodland fruit species. These species grew locally in the wild although some e.g., raspberry, strawberry, and grapes, could have been transplanted to gardens. The garden varieties, however, are indistinguishable from wild varieties. The few cultivated species recovered from 175 Water Street primarily belonged to the family Cucurbitacea. It is important to state that the absence of certain species in the archaeological record does not necessarily exclude them from a list of potentially exploited species and that it is the nature of the plant itself that is largely responsible for its inclusion or non-inclusion in the archaeological record.

The vegetables that have been historically documented as colonial food sources are, in general, nearly totally absent from the archaeological record. However, the dearth of vegetable species in the archaeological record is not really surprising considering the fact that most species of vegetables are consumed before they are allowed to go to seed, or the seed itself has a soft coating and is consumed.

Although a number of exploited plants, cultivated species in particular, may not be represented in the 175 Water Street analysis, it is evident that wild species played an important role in the colonial diet. This could be expected in the more outlying regions of the country, however, it is surprising to note the degree of reliance on wild plants in a city as accessible and cosmopolitan as New York.

Even though imported foodstuffs were readily available, none were identified in this study with the possible exception of Ficus carica (Fig). However, as seen in the Historical Description of Recovered Plant Species, figs were also grown in this country since the mid-eighteenth century.

At least 15 species of plants classified as edible weeds were recovered from Lots 22 and 33. These species could have been used in a variety of ways including as a salad or pot herb, a fruit, a tuber, a tea, in breadstuffs, or medicinally. Most species of edible weeds were retrieved in minimal numbers, with the exception of those members of the family Solanaceae; however, edible weeds accounted for approximately 8% of the total number of seeds identified in this study and 25% of the total number of species identified. The edible weeds present must be considered a potential food source although verification of such cannot be proven unless the species were located in coprolitic material.

Periods of economic stress can be detected through the comparison of species recovered by level within a feature. A dramatic change, especially when domesticated species are replaced by wild species in some quantity, is indicative of such stress. As little is known about the composition of Lots 22 and 33, it is difficult to determine whether or not such stress is indicated here.

Nine species were classified as edible/medicinal. The majority of these were used in treating colds and dysentary and therefore did not illuminate any other ailments or diseases which may have affected the population. Datura stramonium (Jimsonweed) was identified and its use as a narcotic was as common during the eighteenth and nineteenth centuries as it is today.

The number of edible and edible/medicinal species present represented 63% of the total number of species identified.

Seven species of grasses were identified, all of which were introduced to the area, either purposely for forage or accidently as inclusions.

The identification of seeds from archaeological sites can determine the habitat of the area, be it natural or culturally altered. Although generalizations can be made by the presence of woodland fruit species, weeds are often more indicative of the immediate local habitat often indicating waste areas, wetlands, open areas, cultivated fields, etc. The majority of weed species present thrive in waste areas, roadsides, or open fields. However, seven species (Scripus sp., Phalaris arundinacea, Polygonum sp., Glyceria striata, Satureja acinos, Carex sp., and Potamogeton sp.) were classified as thriving in marshes, shores, or moist areas. This is not really surprising due to the site's location although it may be significant in distinguishing between those levels of local fill compared to those in which the fill was brought in from other areas. Although these aquatic species are present in both Lots 22 and 33 they seem to be predominant in sample numbers 513 and 581 of Lot 33. With few exceptions, the privies in Lots 22 and 33 yielded similar plant remains.

The identification of the two features from which the samples were taken are indeed privies. Privies exhibit seeds of primarily edible species in large quantities, and can be considered the result of direct deposition by man. Non-privy features, such as wells, tend to exhibit either no remains or sequences of seed identities different from those of privies. These non-privy features usually contain inedible weed species in small quantities, which are considered to have been deposited by seed rain.

The seasonality of historic features is difficult to determine. Although the seasonality of each level can be estimated, the nature of the recovered species precludes anything more definite. In the case of fruits, for example, the majority of which ripen from June to September, preservation in jams, etc. would allow deposition throughout the year (e.g., raspberries). Larger fruits (e.g., peaches) can be more indicative of seasonality as the seeds would be removed before preservation. Such large seeds, however, would not be expected to be deposited in privies in any quantity. Deposition of weed seeds by seed rain often can be a better indicator of seasonality than those deposited by man.

The analysis of seeds from Lots 22 and 33 has shown that this is an extremely rich site regarding historic floral remains with more than 34,000 seeds recovered. A more complete interpretation of the site could possibly be attained with further analysis of additional features. In consideration of these points, as well as the historical importance of the site, I would recommend that further floral analysis be undertaken.

175 Water Street Species Identification List (Micro-flora)

Edible species:

- Amaranthus retroflexus (Redroot pigweed)
- Arbutus menziesii (Madrone)
- Aronia prunifolia (Purple chokeberry)
- Brassica nigra (Black mustard)
- Chenopodium album (Lamb's quarters)
- Chenopoidum hybridum (Pigweed)
- Chicorium intybus (Chicory)
- Cucurbitacea (Melon/squash family)
- Ficus carica (Fig)
- Fragaris virginiana (Strawberry)
- Lepidium campestre (Peppergrass)
- Liliaceae (Lily family)
- Morus rubra (Mulberry)
- Portulaca oleraces (Purslane)
- Prunus cerasus (Sour cherry)
- Prunus pensylvanica (Pin cherry)
- Pyrus sp. (Pear)
- Rubus occidentalis (Black raspberry)
- Rumex acetosella (Sorrel)
- Rumex crispus (Yellow dock)
- Sambucus canadensis (Elderberry)
- Satureja acinos (Mother-of-thyme)
- Scripus sp. validus, etuberculatus, americanus, smithii (Bulrush)
- Sisymbrium sp. (Wild mustard)
- Solanaceae (Nightshade family: Solanum nigrum or S. americanum
- Vaccinium macrocarpon (Large cranberry)
- VAccinium sp. (Blueberry)
- Vitis aestivalis (Grape)
- Vitis vinifera (Grape)

Edible/Medicinal species:

- Betula sp. (Birch)
- Ceanothus sp. americanus (New Jersey tea)
- Chenopodium ambrosioides (Warmseed/Goosefoot)
- Helianthus sp. (Sunflower)
- Labiatae (Mint family)
- Malvaceae (Mallon family)
- Pinus sp. (Pine)
- Polygonum sp. convolvulus, persicaria, dumetorum, sagittatum, pensylvanicum (Smartweed)
- Trifolium sp. (Clover)

Edible species:

Inedible species:

Ambrosia artemisiaefolia (Ragweed)
Cornus racemosa (Dogwood)
Carex comosa (Sedge)
Cyperaceae: Carex sp. (Sedge)
Datura stramonium (Jimsonweed)
Eleusine indica (Goosegrass)
Euphoribia sp. (Spurge)
Glyceria striata (Fowl mannagrass)
Gramineae sp. (Grass)
Linaria sp. (Toadflax)
Pancium sp. (Panicum)
Paspalum sp. (Paspalum)
Phalaris arundinacea (Reed canary grass)
Potamogeton sp. (Pondweed)
Setaris lutescens (Yellow bristlegrass)
Sisyrinchium atlanticum (Blue-eyed grass)

Description Unavailable Considered Inedible

Anemone cylindrica (Long-headed anemone)
Compositae (Daisy family)
Cycloloma striplicifolium (Ringwing)
Hibiscus militarid (Rosemallow)
Lycium halimifolium (Matrimony-vine)
Pilea sumila (Clearweed)
Solanum rostratum (Buffalobur)
Solanum triflorum

175 Water Street Floral Identification: Lot 22

Sample No.	Identification	Quantity	Comments
Cat. #5143 22.02.003 (F41.1)	*Rubus occidentalis*	+3200	
	Fragaria virginiana	± 600	
	Solanum sp. nigrum or americanum	+ 90	
	Ficus carica	± 70	
	Triflorum sp.	± 50	
	Phalaris arundinacea	± 10	
	Vitis sp.	3	
	Brassica nigra	2	
	Sisyrinchium atlanticum	2	
	Solanum rostratum	2	
	Linaria sp.	1	
	Total	± 4030	
Cat. #5131 22.02.002.1 (F41.1)	Rubus occidentalis	+ 225	
	Fragaria virginiana	± 30	
	Ficus carica	± 12	
	Trifolium sp.	± 10	
	Tambucus canadensis	6	
	Vitis vinifera	2	
	Solanum sp.	2	
	Chenopodium ambrosioides	1	
	Datura stramonium	1	
	Phalaris arundinacea	1	
	Total	± 290	
Cat. 5187 22.02.007 (F41.2)	Rubus occidentalis	+ 460	
	Fragaris virginiana	± 250	
	Solanum nigrum or americanum	+ 75	
	Trifolium sp.	± 10	
	Ceanothus sp.	10	
	Sambucus canadenis	9	
	Solanaceae sp.	8	
	Pinus sp.	6	
	Portulaca oleracea	5	
	Polygonum sp. possibly convolvulus	4	
	Scripus sp. possibly etuberculatus	3	

Lot 22 (continued)

Sample No.	Indentification	Quantity	Comments
	Gramineae sp.	2	
	Sisymbrium sp.	2	
	Amaranthus retroflexus	1	
	Cornus racemosa	1	
	Eleusine indica	1	
	Euphorbia sp.	1	
	Glyceria striata	1	
	Polygonum persicaria	1	
	Scripus validus	1	
	Vitis vinifera	1	
	Total	± 852	
Cat. 5184 22.02.006.1 (F41.1)	Rubus occidentalis	± 30	
	Fragaria virginiana	9	
	Tambucus canadensis	1	
	Total	± 40	
Cat. # 5127 22.02.002.1 (F41.1)	Rubus occidentalis	45	
	Fragaris virginiana	24	
	Graminae: possibly Glyceria sp.	8	
	Trifolium sp.	5	
	Sambucus canadensis	1	
	Sisyrinchium atlanticum	1	
	Unidentified	2	Fragments
	Total	86	
Cat. 5265 22.02.022.1 (F41.1)	Fragaria virginiana	± 125	
	Phalaris arundinacea	± 12	
	Amaranthus retroflexus	6	
	Chenopodium ambrosioides	5	
	Sisyrinchium altanticum	4	
	Chenopodium album	1	
	Portulaca oleracea	1	
	Rubus occidentalis	1	
	Scripus smithii	1	
	Unidentified	1	
	Total	± 157	

Lot 22 *continued*

Sample No.	Indentification	Quantity	Comments
Cat. #5177 22.02.005.1 (F41.1)	Rubus occidentalis	+ 2900	
	Solanaceae sp.	± 218	
	Brassica nigra	± 100	
	Ficus carica	± 100	
	Fragaria virginiana	± 100	
	Sisyrinchium atlanticum	± 100	
	Cycloloma atriplicifolium	7	
	Ceanothus sp.	5	
	Sambucus canadensis	± 5	
	Pinus sp.	2	
	Malvaceae sp.	1	
	Potomogeton sp.	1	
	Vitis vinifera	1+	
	Unidentified	2	
	Total	± 3542	
Cat. #5268 22.02.006.1 (F41.1)	Rubus occidentalis	± 306	7 charred
	Fragaria virginiana	± 50	
	Solanum sp. triflorum or nigrum	20	
	Sambucus canadensis	5	
	Vaccinium macrocarpon	4	
	Compositae sp.	1	
	Liliaceae sp.	1	
	Malvaceae sp.	1	
	Mouis rubra	1	Charred
	Trifolium sp.	1	
	Vitis sp.	1	Fragment
	Unidentified	1	Poor condition
	Total	± 392	
Cat. #5220 22.02.006.02 (F41.1)	Rubus occidentalis	± 700	
	Ficus carica	± 50	
	Compositae: Helianthus sp.	± 40	
	Compositae sp.	± 40	
	Fragaria virginiana	± 20	
	Solanum sp. possibly triflorum	± 20	
	Sambucus canadensis	± 10	
	Polygonum sp.	5	
	Rosacea: possibly Aronia prunifolia	3	

Lot 22 continued)

Sample No.	Indentification	Quantity	Comments
	Vitis vinifera	3	
	Cycloloma atriplicifolium	± 2	
	Cucurbitaceae sp.	1	Fragment
	Pyrus sp.	1	
	Unidentified	± 10	Fragment and leaf remains
	Total	± 905	
	Lot 22 Total:	10,294	

175 Water Street Floral Identification: Lot 33

Sample No.	Indentification	Quantity	Comments
Cat. #306 33.05.020.1 (F2.2)	Rubus occidentalis	± 511	
	Trifolium sp.	± 51	
	Fragaria virginiana	± 8	
	Portulaca oleracea	4	
	Ambrosia artemisiaefolia	3	
	Vitis sp.	2	
	Sambucus candadensis	1	
	Solanaceae: Lycium Haliminfolium	1	
	Solanun rostratum	1	
	Total	± 582	
Cat. #309 33.05.019 (F2.2)	Rubus occidentalis	± 384	
	Ficus carica	303	
	Fragaris virginiana	± 115	
	Vitis sp. aestivalis abd vinifera	± 36	
	Solanaceae sp.	17	
	Amaranthus retroflexus	3	
	Sambucus candensis	3	
	Sisyrinchium sp.	3	
	Euphorbia sp.	1	
	Portulaca oleracea	1	
	Rumex acetosella	1	
	Solanum nigrum	1	
	Total	± 868	

Lot 33 continued

Sample No.	Indentification	Quantity	Comments
Cat. #314	Rubus occidentalis	304	
33.07.017.1	Ficus carcia	263	
(F2.2)	Fragaria virginiana	15	
	Solanaceae sp.	10	
	Vitis vinifera	± 5	Fragments
	Chicomin intybus	1	
	Datura stramonium	1	
	Potomogeton epihydras	1	
	Satureja acinos	1	
	Solanum triflorum	1	
	Trifolium sp.	1	
	Unidentified	1	Poor condition
	Total	± 604	
Cat. #318	Rubus occidentalis	408	
33.05.022.1	Ficus carica	361	
(F2.2)	Fragaria virginiana	± 140	
	Solanaceae sp.	88	
	Vitis sp. aestivalis and vinifera	± 55	
	Trifolium sp.	± 5	
	Sambucus canadensis	4	
	Amaranthus retroflexus	2	
	Cicurbitaceae sp.	2	
	Satureja acinos	2	
	Arbutus menziesii	1	
	Euphorbia sp.	1	
	Pilea pumila	1	
	Portulaca oleracea	1	
	Potomogeton sp.	1	
	Unidentified	4	
	Total	± 1076	
Cat. #334			
33.05.023.1	Fragaria nirginiana	± 4660	
(F2.2)	Rubus occidentalis	± 3110	
	Ficus carica	± 2000	
	Solanaceae sp.	± 511	
	Vitis vinifera and aestivalis	± 159	
	Amaranthus retroflexus	± 20	
	Rumex acetosella	± 20	
	Hibiscus militaris	± 11	
	Cycloloma atripli-cifolium	± 10	

Lot 33

Sample No.	Indentification	Quantity	Comments
	Sambucus canadensis	± 10	
	Betula sp.	± 5	
	Brassica sp.	± 5	
	Eleusine indica	± 5	
	Euphorbia sp.	± 5	
	Portulaca oleracia	± 5	
	Prunus pensylvanica	2	
	Unidentified	3	Fragments
	Total	±10541	
Cat. #341 33.95.028.1 (F2.2)	Fragaria virginiana	± 3158	
	Rubus occidentalis	± 3138	
	Ficus carica	± 3000	
	Solanaceae sp.	± 527	
	Vitis vinifera	105	
	Malvaceae: Hibiscus sp.	± 22	
	Prunus pensylvanica	± 8	
	Anemone cylindrica	± 7	Uncertain ID.
	Cucurbitaceae sp.	2	
	Datura stramonium	1	
	Morus rubra	1	
	Rumex acetosella	1	
	Sambucus canadenis	1	
	Total	± 9971	
Cat. #513 33.05.054.1 (F2.2)	Rumex acetosella	± 184	
	Fragaris virginiana	± 156	
	Rubus occidentalis	56	
	Solanum triflorum	22	
	Trifolium sp.	14	
	Polygonum dumetorum	10	
	Scripus americanus	9	
	Polygonum sp. possibly sagittatum	7	
	Prunus cerasus	6	
	Chenopodium hydridum	5	Poor condition
	Rumex crispus	5	
	Polygonum persicaria	4	
	Vitis vinifera	4	
	Sisyrinchium altanti-aim	3	
	Cucyrbutaceae sp.	2	
	Paspalum sp.	2	
	Setaria lutescens	2	
	Amaranthus sp.	1	Poor condition
	Carex comosa	1	

Lot 33 continued

Sample No.	Indentification	Quantity	Comments
	Carex sp.	1	
	Hibiscus militaris	1	
	Labiatae sp.	1	
	Lepidium campestre	1	
	Panicum sp.	1	
	Polygonum pensylvanicum	1	
	Sambucus canadensis	1	
	Scripus sp.	1	
	Sisymbrium sp. possibly Ioeselli	1	
	Vaccinium sp.	1	
	Unidentified	4	Poor condition
	Total	±507	
Cat. #581 33.01.027.1 (F3.9)	Fragaris virginiana	± 120	
	Rubus occidentalis	74	
	Rumex acetosella	± 61	
	Solanum triflorum	38	
	Prunus cerasus	16	
	Cyclolone atriplicifolium	8	
	Trifolium sp.	7	
	Labiatae sp.	6	
	Setaria sp.	6	
	Arbutus menziesii	5	
	Cucurbitaceae: Citrullus sp.	5	
	Scripus sp.	5	
	Polygonum dumetorum	4	
	Polygonum persicaria	4	
	Amaranthus retroflexus	3	
	Solanaceae sp.	3	
	Sambucus canadensis	2	
	Carex comosa	1	
	Chenopodium hybridum	1	
	Prunus pensylvanica	1	
	Rumex crispus	1	
	Setaria lutescens	1	
	Sisyrinchium altanticum	1	
	Vitis vinifera	1	
	Unidentified	2	
	Total	± 376	

Lot 33 continued

Sample No.	Indentification	Quantity	Comments
	Sisyrinchium atlanticum	1	
	Vitis vinifera	1	
	Unidentified	2	
	Total	± 376	
Cat. #589 33.06.002.1 (F8.1)	Fragaria virginiana	3	
	Rubus occidentalis	2	
	Ambrosia sp.	1	
	Ficus carica	1	
	Total	7	
	Lot 33 Total:	24,532	

Historical Description of Recovered Plant Species

Edible species:

Amaranthus retroflexus (Redroot Pigweed)

Amaranth, naturalized from tropical America, grows nearly all over the United States. A. retroflexus was highly prized by Indians, the seeds being gathered, ground, and made into cakes or porridge. The leaves are also used as a salad (Medsger 1966).

Arbutus menziesii (Madrone)

Description unavailable although considered to be edible as it belongs to the Ericaceae family whose members include wintergreen, huckleberries and blueberries. (Martin and Barkley 1961).

Aronia prunifolia (Purple chokeberry)

Description unavailable but considered edible primarily due to its membership in the family Rosaceae (Raspberry family) (Montgomery 1977).

Brassica nigra (Black mustard)

This annual was listed as an herb in the 17th and 18th centuries by Favretti (1962). The seed is edible and used for condiment and medicinally for mustard plasters or as an emetic. Young leaveas are used for salad and pot herbs. (Medsger 1966). Originally naturalized from Eurasia, mustard is now found throughout most of the United States (U.S.D.A. 1971).
Season - July - November

Chenopodium sp. album, hybridum (Lamb's quarters, pigweed)

Most members of this genus are edible being used primarily as cooked greens, cereal or flour. The highly nutritious seeds can be boiled to make a porridge or ground into flour. They are primarily found in waste areas throughout the United States (Peterson 1977).

Chicorium intybus (Chicory)

Although native to the Mediterranean and cultivated in Europe, in North America chicory has become a weed growing in waste areas and along roadways. The young leaves, a source of Vitamins A and C, can be boiled as a pot herb in the spring. A variety has been developed as a substitute, adulterant or flavorer for coffee (ground roots are roasted). Hussey (1974) describes the perrenial as having medicinal value.

Cucurbitaceae (Melon/Squash family)

Members of the family Cucurbitaceae were already being cultivated by the Indians when the early settlers arrived. Pumpkins, watermelons, and summer squashes (yellow crooknecks and greenish-white patty-pans) were particular Indian favorites (Flectcher 1971).

The colonists also had their favorite members of this family and often sent for seeds including those of cucumbers and melons (Mason 1968).

Leighton (1976) listed the following varieties of melons as eighteenth century American vegetables: "... the green fleshed melon; the netted wrought melon; a rough, knotty melon called the Diarbekr; the Portugal or King Charles Melon; the Cantaloupe from Armenia; the Zatta Melon from Italy." Gourds and cucumbers were mentioned as well.

Favretti (1962) lists those species of common garden crops and the century they became popular:

17th century:	Cucumis melo (Musk melons)
	Cucumis sativus (Cucumber/cowcumber)
	Cucurbita pepo (Pumpkins/Ponpions)
	Cucurbita sp. (Squashes)
	Citrullys vulgaris (Melons)
18th century:	Lagenaris (Squash, Calabash, or Bottle Gourd)
19th century:	Cumcmis anguria (Cucumber, round prickly or Indian or Bur Gherkin)

Ficus carica (Fig)

Although William Hamilton is credited with bringing figs to this country about 1790, the fruit was well known in America well before this date, having been imported since the seventeenth century and growing in the southern areas of the country at least from the mid-eighteenth century. In 1787 Thomas Jefferson wrote that the fig was so well known in America that "nothing need be said" (Leighton 1976: Favretti 1962).

Fragaria virginiana (Strawberry)

Strawberries were used by Indians as a food source and were growing abundantly along the East coast when the settlers arrived (Leighton 1976). Favretti (1962) listed the species as a common garden fruit in the seventeenth century. Wild strawberries were used in baking, preserves, desserts and to make wine (Benson 1937). The fruit is a good source of Vitamin C, iron, potassium, sulphur, calcium, sodium and silicon. The leaves are brewed for a tea, also high in Vitamin C. (Peterson 1977).

Lepidium campestre (Peppergrass)

This species can be used in salads, as a cooked green, or as a seasoning. It is found in waste places and fields throughout the United States (Peterson 1977).

Liliacea (Lily family)

Members of this family include lilies, asparagus, wild chives, wild leeks, solomons seal, and violets (Montgomery 1977).

Morus rubra (Mulberry)

Several species of mulberry, including Morus rubra, are native to America. In a letter to the Committee of the Free Society of Traders in 1683, William Penn noted the natural presence of white and black mulberries; Gabriel Thomas noted the same two varieties in 1698 in "An Historical and Geographical Account of Pennsylvania and of West New Jersey". (Myers 1959). Most authorities seem to agree that the white mulberry cited by Penn and Thomas was in reality Morus rubra, also known as the English mulberry, and was introduced to the colonies from Europe primarily for its tasty fruit (Leighton 1976; Medsger 1966).

Portulaca oleracea (Purslane) - French salads; Indian weeds.

Kalm observed it growing wild among the corn, as did Champlain (Leighton 1976).

Purslane, considered to be a weed in Canada and the United States, has long been a food source in Europe and was introduced to this continent in colonial times. It is an annual and grows well in fertile sandy soil and is prevalent throughout the country. Its widespread distribution is due primarily to its enormous seed production; more than 52,000 per 1-2" plant. The entire plant is edible: raw as a salad herb, boiled as a vegetable, used in soups, and the minute black seeds when mixed half and half with wheat flour are used in breadstuffs. Purslane is an excellent source of Vitamins A and C (Peterson 1977).

Prunus cerasus (Sour cherry)

This variety was introduced from Europe but has since grown wild in the eastern United States. The fruit ripens in July and is used for pies and jellies. Nearly all the cherries cultivated for their edible fruit have been developed from this species.

Cherries were an important fruit both for the Indians and the early settlers. Early narratives on the Pennsylvania area, including those of William Penn, state the importance and availability of cherries although descriptions and specifications are not included.

The cherries in America were disappointing to those settlers accustomed to the English varieties. Wines and preserves were the primary product, and garden cherries from England were imported for eating. The only native cherry to surpass the English variety was Prunus serotina, known for its beautiful wood and whose fruit was used, along with sugar and rum, to make a favorite colonial drink known as cherry bounce (Leighton 1976).

Prunus pensylvanica (Pin cherry)

The only early light-red cherry in the northern states, the pin cherry ripens from July to September. The cherries are small and sour, used only in jellies and syrups; although the fruit is too sour to be eaten raw, birds soon strip the trees (Medsger 1966).

Pyrus sp. (Pear)

Pears were very popular in eighteenth century America and at least 36 varieties were carefully cultivated including Barlett (Bon Chretien), Bergamot, Warden, Sugar Pear and Seckel.

Rubus occidentialis (Black raspberry)

This species, also known as the American "black-cap raspberry", is one of two varieties of native American raspberries (the other being Rubus strigosus, American red, similar to the European Rubus idaeus). Wild American raspberries were considered superior to the imported varieties and even though plentiful in the wild, they were often transplanted to the colonial garden where fruit was borne the same year (Leighton 1976). Peter Kalm lists Rubus occidentalis as the fifth most abundant woodland shrub in the Philadelphia area (Benson 1937) and, therefore, it is not surprising that the fruit was extensively collected by Indians and settlers alike. Indeed, it has been called "the most valuable wild fruit on this continent" and is an extremely rich source of Vitamin C (Peterson 1977). In addition to eating the fruit raw, and its use in making preserves, etc., raspberries and blackberries were used in winemaking.

Rumex sp. acetosella (Sorrel), crispus (Yellow dock)

A ubiquitous perennial, Rumex acetosella and crispus are found in gardens, pastures, meadows and waste areas, persisting in areas of poor drainage and low soil fertility. Rumex acetosella and crispus are edible and used in salads or as cooked greens. Originally naturalized from Eurasia, they are now found throughout the United States (U.S.D.A. 1971).

Sambucus canadensis (Elderberry)

The elderberry is a shrub which bears its fruit from August to October. Each berry has 3-4 seeds. The fruit is used for pies, jellies, and wine (Medsger 1966). The wild fruit is among the richest in Vitamin A, calcium, thiamine, niacin and protein. The plant prefers rich, moist soil (Peterson 1977).

Kalm described several of the fruits, including elderberries, valuable to Indians and settlers alike claiming that Sambucus canadensis was the ninth most populous woodland shrub/tree in Pennsylvania (Benson 1937).

Among its other uses, the elderberry had many medicinal ones, in fact, Kalm dubbed it the "whole Iroquois pharmacy" (Secor 1974).

Satureja acinos (Mother-of-thyme)

This edible herb is found on roadsides, in pastures, on the edge of woods and shores and is used primarily as a seasoning (Peterson 1977).

Scripus sp. validus, etuberculatus, americanus, smithii (Bulrush)

Found in mud, or shallow fresh or brackish water throughout the country, members of this genus are considered edible and used in salads, as a cooked vegetable, potato and for flour. The young shoots are eaten raw or cooked, the pollen and ground-up seeds are used as flour. The tips of the roots can be roasted and eaten like potatoes or dried and pounded into flour (Peterson 1977).

Sisymbrium sp. (Wild mustard)

This annual or winter herb is found in fields of small grain gardens and waste places. Naturalized from Europe, it is now common throughout the United States (U.S.D.A. 1971).

Solanaceae (Nightshade family) possibly Solanum nigrum or Solanum americanum

Solanum nigrum is an annual herb, naturalized from Europe, a weed found in waste places, roadsides, disturbed and cultivated fields and seabeaches. Solanum americancum is native to rocky or dry open woods, thickets, shores, and openings, often spreading to cultivated or waste ground. The berries, when ripe (May-November), can be eaten raw and used in preserves or baking (U.S.D.A. 1971).

Vaccinium macrocarpon (Large Cranberry)

This wild cranberry grows in marshes and bogs along the East coast. The large red berries ripen in September and October but will remain fresh throughout the winter. Not eaten raw, the berries are best used in baking, sauces, or for juice. The Indians made extensive use of the berries and they were prized by settlers because they kept so well (Medsger 1966). The berry was gathered but not cultivated until the 1800s (Favretti 1962). This particular variety has been cultivated with the primary areas of cultivation being Cape Cod and South Jersey.

Vaccinium sp. (Blueberry)

Over thirty-five different species of blueberries and huckleberries are native to the United States. The fact that they grew in such profusion delayed their cultivation until recently. Most species grow in open woodlands and clearings, though some are found in swamps. Indians and settlers alike enjoyed the fruit raw, in cooking and baking. They can also be used in preserves.

Vitis sp. aestivalis, vinifera

Two varieties of grapes were identified from the extracted plant remains: Vitis aestivalis (summer grape) and Vitis vinifera (White grape). Both species have been noted in the literature as having been available in colonial times. Indeed, more has been written on grapes as an historic food source than almost any other plant.

Vitis aestivalis is a native species from New England to Florida and ripens from August to October. The seeds are large for the size of the berry and they were primarily used for eating, jellies and pies (Medsger 1966).

Vitis vinifera, "White and red, blue, muscadine", has been listed as a garden fruit in New England during the 17th century although primarily it is a Eurasian species (Favretti 1962).

Vitis labrusca, a species native to the Eastern United States, ripens from August to November, has a musky odor and taste and is best suited for jellies (Medsger 1966).

These varieties are only a few of the more than two dozen species native to the United States. Grapes, in general, favor moist, fertile ground along stream banks, beaches, fences, stone walls and near the edges of woods.

"Nearly every traveler to America both before and during the early years of settlements noted the abundance of wild grapes." Scuppernogs, white, blue, and pork grapes were noted in 1644 in reference to the Dutch settlement of New Netherland (Carrier 1923).

Wine made from native American grapes was produced and shipped to England but the results were unsuccessful. The American wine lacked the fine quality of French wines and served only to increase the negative sentiments against America and her products (Carrier 1923). In 1750, Kalm pronounced the wine made of native grapes as "Sour and sharp and has not nearly such an agreeable taste as that which is made from European grapes" (Benson 1937).

Even though initial attempts at wine production failed, continual efforts were made during the eighteenth century to transplant European varieties of wine grapes. The most popular variety was Vitis vinifera, a European wine grape, but vinifera grapes struggled with the weather, soil, and plant pests, particularly phylloxera, and never became the great American producer it was meant to be.

The failure of vinifera grapes in America is noteworthy. It forced winemakers to use native grapes and experiment with hybrids. Grapes of the Vitis labrusca variety were used throughout colonial times in the Mid-Atlantic region for domestic consumption. It also increased the volume of wine imports as well as the importation of Scotch and Irish whiskey, West Indian rum, French cognac, and Spanish brandy.

The true beginnings of the commercial grape wine culture in America started around 1820 when a hybrid of Vitis vinifera and Vitis labrusca resulted in the Catawba wine grape. In the 1820s, a labrusca variety, the Concord, produced not only excellent wine, but also juice and preserves (McGinty 1980).

Edible/Medicinal species:

Betula sp. (Birch)

Found primarily in the Eastern United States, the sap of all birches is edible and processed and used like maple sap. Twigs can also be used to make tea. Medicinally it is used to treat dysentary (Peterson 1977; Miller 1976).

Ceanothus sp. americanus (New Jersey tea)

As the name implies, the thoroughly dried leaves of this species are used for tea. It was a popular substitute for oriental tea during the second half of the eighteenth century (Peterson 1977). Medicinally used for dysentary, asthma, and a gargle (Miller 1976).

Chenopodium ambrosioides (Wormseed, Goosefoot)

This variety of Chenopodium was so named because of its medicinal qualities as a remedy for worms in children (Miller 1976).

Other varieties of Chenopodium were especially valuable to the Indians. Seeds of Chenopodium leptophyllum and Chenopodium fremontii were gathered, ground and used for cakes, gruel, and flour. The greens of Chenopodium were used raw or cooked as spinach. The plant was originally introduced from Asia and Europe. It is now spread throughout the United States and found primarily in disturbed areas, along roadsides, etc. (Medsger 1966).

Helianthus sp. (Sunflower)

This native annual herb is found in cultivated fields, waste places, grainfields and roadsides. Introduced from the Midwest, Helianthus sp. is used for coffee, nuts, cereal, flour and oil. The seeds are smaller than the domesticated variety (U.S.D.A. 1971; Peterson 1977). Medicinally it is used in treating coughs and dysentary (Miller 1976).

Labiatae (Mint family)

Labiatae includes among its members sage, mint and false penny-royal. Mint has traditionally been used in teas, for seasoning, and medicinally for colds (Martin and Barkley 1961; Miller 1976).

Malvaceae (Mallow family)

Members of this family are annual or biennial herbs (weeds), naturalized from Europe and now spread throughout the United States. They are commonly found in cultivated fields, waste places and roadsides. Used as salad or soup greens, members are also used medicinally for coughs, irritation of the bowels, kidney and urinary organs, and as a poultice for boils (U.S.D.A. 1971; Peterson 1977; Miller 1976).

Pinus sp. (Pine)

Pines are found in dry to moist soil throughout the United States. All species are edible and can be used as tea, candy, cooked vegetables, flour, or medicinally (Peterson 1977).

Polygonum sp. convolvulus, persicaria, dumetorum, sagittatum, pensylvanicum (Smartweed)

Members of the *Polygonum* genus are non-poisonous and are generally found in waste places and damp areas. Although some species in this group are too acid to be eaten, many (including P. persicaria) are mild tasting and can be used as cooked greens or as a salad herb (Peterson 1977). P. persicaria has been used medicinally as a diuretic and for fevers and colds (Miller 1976).

Trifolium sp. (Clover)

Originally imported from England, clover now can be found in all temperate parts of North America; different varieties flourish in areas from wetlands to drier areas.

Preferred as a forage, the various species of clover are edible as well as having medicinal properties. Clover can be eaten raw or cooked, used as a tea or as a breadstuff. Medicinally it was used to treat ulcers, corns, and burns (Miller 1976).

Inedible species:

Ambrosia artemisiaefolia (Ragweed)

This annual herb is found in old pastures, wastelands, roadsides and vacant lots. It is native to America and found throughout the United States (U.S.D.A. 1971).

Cornus racemosa (Dogwood)

Dogwood species have been cultivated in the eastern United States at least since the seventeenth century. However, few references have been made to Cornus racemosa.

Carex comosa (Sedge)

See Cyperaceae: Carex sp.

Cyperaceae: Carex sp. (Sedge)

A perennial weed, sedge is native to the United States and found in marshes, swamps, rich meadows and shores. The common species in the Pennsylvania area include: Carex lasipcarpa, Carex latifolia, and Carex esculentus. Season - May to September (U.S.D.A. 1971).

Datura stramonium (Jimsonweed)

An annual herb/weed which flourished in cultivated fields, on rich soils, and waste places. The plant is often used as a narcotic and is poisonous. It was originally introduced from Eurasia and Africa (U.S.D.A. 1975). The species, known also as the thornapple or Jamestown weed, was a common New England garden plant in the seventeenth century. (Favretti, 1962). "Jefferson said the French invented a preparation of this "most elegant among poison plants, which 'every man of firmness' carried in his pocket in the time of Robespierre 'to anticipate the gillotine'. He refused on account of his grandchildren, to grow it in his garden, but he listed it among Virginia's medicinal plants" (Leighton 1976).

Eleusine indica (Goosegrass)

Goosegrass is found in waste places, fields and open ground in the eastern half of the United States (Hitchcock 1971).

Euphorbia sp. (Spurge)

At least 10 species of spurge are found in the eastern United States, many of which are native. They are herbs, primarily annuals, which thrive in dry, sandy soils in fields, waste areas, and roadsides. A member of the family Euphorbiaceae (U.S.D.A. 1971).

Glyceria striata (Fowl Mannagrass)

Indigenous to moist meadows and wet places throughout North America.

Gramineae (Grass family)

Due to the large amount of native forested area, the number of grass species available to the settlers of the Middle Atlantic colonies were few with Andropogon sp. predominating. As livestock raising became established, varieties of timothy and ryegrass, as well as clover, were cultivated.

Linaria sp. (Toadflax)

This perennial herb is found along roadsides, dry fields and waste places, and is mildly poisonous to stock. Naturalized from Eurasia, it is now found throughout the United States (U.S.D.A. 1971).

Panicum sp. (Panicum)

Numerous species of this grass are found throughout the United States. It is a common ingredient in hay (Hitchcock 1971).

Paspalum sp. (Paspalum)

This grass is generally found in meadows and is a common pasture grass (Hitchcock 1971).

Phalaris arundincea (Reed Canary Grass)

Found naturally in marshes, riverbanks and moist places, it is also grown for ornament in gardens (Hitchcock 1971).

Potamogeton sp. (Pondweed)

Potamogeton is a large genus composed of over 100 species of aquatic plants, nearly 40 of which are native to North America. These weed plants are found on the bottom of ponds, lake margins and in shallow streams. These aquatic perennials are inedible (Martin and Barkley 1961).

Setaris lutescens (Yellow bristlegrass)

Found in cultivated soil and waste places, this species was introduced from Europe and distributed throughout the United States (U.S.D.A. 1971).

Sisyrinchium atlanticum (Blue-eyed grass)

Native to this area, Sisyurinchium atlanticum is found extensively today in the Pine Barrens of New Jersey. Some members of this genus are used medicinally as a remedy for constipation (Leighton 1976).

Description Unavailable, Considered Inedible

Anemone cylindrica (Long-headed anemone)

Compositae (Daisy family)

This family includes among its members a number of weeds and flowers including Helianthus and Ambrosia. Compositae contains both edible and inedible species.

Cycloloma atriplicifolium (Ringwing)

A farmland weed.

Hibiscus militaris (Rosemallow)

Particular description unavailable. See Malvaceae.

Lycium halimifolium (Matrimony-vine)

A member of the nightshade family, Solanaceae. See section on Solanaceae.

Pilea pumila (Clearweed)

A member of Urticaceae family, found in northeastern United States (Montgomery 1978).

Solanum rostratum (Buffalo bur)

Solanum triflorum

Description of this particular species in unavailable. See section on Solanaceae for information concerning this family.

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MACRO-FLORAL ANALYSIS
(Joan H. Geismar)

In addition to the floral data compiled from eighteen analyzed samples of microscopic seeds from three of the site's features, (see Micro-floral Analysis, this chapter) macro-floral material from features was identified and tabulated by Amy Pickell and Jesse Ponz. These 21,243 specimens were organized into nineteen categories ranging from edible varieties, such as common fruits, squashes, melons, and nuts, to non-food producing trees, to seaweed. Data from the thirty features producing this material are presented in Macro-floral Table 4.82. Here the data are combined into ten categories: maize (FS), squash and mellons (FA), common fruits (FG), grape/raisin (FK), nuts (FC,FR), non-food producing trees (FB, FD, FM, FN, FP, FV, FW), citrus fruit (FJ), olive (FE), coconut/date (FF), pith/fiber (FL), persimmon (FO), and seaweed (FQ). While feature levels considered original, or primary, landfill (see Chapter 5) are listed separately, all occupation feature levels are grouped in this table.

The macro-floral data indicate several varietal concentrations within features. For example, Feature 30, a box in Lot 32, produced the greatest number of grape/raisin pits from the site (65.1%). This is particularly interesting since the glass from the feature suggests a possible wine-making activity (see Glass, this chapter). Also, since micro-floral analysis indicated that aquatic plants were present in site deposits (see Micro-floral Analysis, this chapter), it is perhaps noteworthy that seaweed, albeit of unknown varieties, was identified in three feature deposits. Two of these were primary fill levels, one was a possible nightsoil deposit (Locus 18.02.011) from a privy in Lot 18.

With 155,088 specimens of common fruit pits and seeds coming from the site, or 73.4% of the site's total macro-floral assemblage, this category was unquestionably the largest macro-floral component from the analyzed occupation and landfill deposits. In the late-seventeenth century, visitors to New York noted trees "so laden with peaches and other fruits that one might doubt whether there were more leaves or fruit on them" (Danckaerts and Sluyter 1679 as quoted in Still 1956:16). It appears from the macro-floral data that this same abundance, or at least an equivalent availability, persisted into the eighteenth and nineteenth centuries.

Although relatively high percentages of these common fruit pits and seeds were prevalent, the most consistently high feature percentages in this category were found in the "9" or original landfill levels within features; in seven of these deposits, at least sixty percent of the macro-floral material was debris from common fruits. However, an unaccountably low percentage (40.0%) was found in Feature 56, the remaining landfill deposit; this was one of two backhoe-trench deeptests dug adjacent to the Lot 29/30 common wall to test for river bottom, and the only deep-fill from which this material was analyzed. (Apparently no macrofloral material was analyzed or recovered from Feature 55, the other deeptest theoretically included in the analysis). On the other hand, the highest percentages for common fruits came from the privy in Lot 22 (F41), with 21.6%, and the cofferdam/box (F49) in Lot 22 (see Landfill, Chapter 5), with 19.2%.

Macro-Floral Table 4.82 (continued)

Lot Number	Feature Description	Feature Number	Levels	FS	FA	FG	FK	FC, FR	FB FD,FM FN,FP FV,FW	FJ	FQ	FE	FF	FL	FO	Totals & Site %
				# %	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %
18	box	52	2	-	25 (30.1)	47(56.6)	-	4 (4.8)	4 (4.8)	-	-	2(2.4)	1 (1.2)	-	-	83(0.4)
			9	-	-	6(60.0)	-	3 (30.0)	1 (10.0)	-	-	-	-	-	-	10(0.0)
	unid.	53	1	-	1 (25.0)	3(75.0)	-	-	-	-	-	-	-	-	-	4(0.0)
	cistern base	54	1	-	1 (20.0)	2(40.0)	-	-	-	-	-	-	-	2 (40.0)	-	5(0.0)
29/30	deeptest	56	1	-	2 (40.0)	2(40.0)	-	1 (20.0)	-	-	-	-	-	-	-	5(0.0)
33	barrel	57	1	-	4 (2.0)	181(91.4)	2 (1.0)	6 (3.0)	3 (1.5)	-	-	-	-	2 (1.0)	-	198(0.9)
			9	-	7 (41.2)	9(59.9)	-	-	-	-	-	-	-	-	-	16(0.1)
Variable Totals and % of Site Assemblage				10(0.0)	1907(9.0)	15,588(73.4	1219(5.7)	1536(7.2)	193(0.9)	1(0.0)		7(0.0)	43(0.2)	663(3.1)	14(0.1)	21,243(99.9)

*Translation of Macro-floral codes: FS, maize; FA, squash/melon; FG, common fruits; FK, grape/raisin; FC,FR, nuts; FB,FD,FM, FN, FP, FW, non-fruit-bearing trees; FJ, citrus; FE, olive; FF, coconut/date; FL, pith/fiber; FO, persimmon; FQ, seaweed.

Macro-Floral Table 4.82 175 WATER STREET: Number and Percent of Macro-floral Material by Feature (Flora Coded*)

Lot Number	Feature Description	Feature Number	Levels	FS	FA	FG	FK	FC, FR	FB FD,FM FN,FP FV,FW	FJ	FQ	FE	FF	FL	FO	Totals & Site %
				# %	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %
36	cistern	1	1	-	-	-	30 (100.0)	-	-	-	-	-	-	-	-	30(0.1)
33	privy	2	2	-	5 (4.8)	29(27.9)	30 (28.8)	19 (19.2)	19 (19.2)	-	-	-	1 (1.0)	1 (1.0)	-	104(0.9)
			9	-	32 (8.2)	300(76.3)	-	33 (8.4)	9 (2.3)	-	14 (3.6)	-	3 (0.8)	-	-	391(1.8)
	barrel/cistern	3	9	-	175 (10.3)	1486(87.6)	-	9 (0.5)	9 (0.5)	-	-	-	2 (0.1)	3 (0.2)	12 (0.7)	1696(8.0)
	cistern	4	3	-	-	2(66.7)	1 (33.3)	-	-	-	-	-	-	-	-	3(0.0)
	builders' trench	25	1	-	1 (16.7)	4(66.7)	-	-	1 (16.7)	-	-	-	-	-	-	6(0.0)
32	box	30	1,2,4	-	341 (10.2)	2015(60.3)	793 (23.7)	10 (0.3)	9 (0.3)	-	-	-	2 (0.1)	170(5.1)	-	3340(15.7)
30	barrel	31	1,2	-	136 (3.4)	2750(68.7)	243 (6.1)	794 (19.8)	6 (0.1)	1 (0.1)	-	2(0.0)	1 (0.0)	73(1.8)	-	4006(18.9)
23	privy	32	1,2,3	-	6 (13.7)	27(60.0)	-	3 (6.7)	-	-	-	-	-	9(20.0)	-	45(0.2)
	unid.	33	1	-	-	2(25.0)	-	-	6 (75.0)	-	-	-	-	-	-	8(0.0)
	"pit"	34	1,2.3,4,5	7(2.2)	9 (2.8)	170(53.1)	-	36 (11.3)	9 (2.8)	-	-	-	9 (2.8)	80(25.0)	-	320(1.5)
	box	35	1,2	-	7 (7.9)	69(77.5)	-	11 (12.4)	-	-	-	-	-	1(1.1)	1 (1.1)	89(0.4)
	box	36	1,2	-	56 (25.1)	118(52.3)	11 (4.9)	35 (15.7)	-	-	-	-	-	3(1.3)	-	223(1.0)
	barrel	37	1	-	177 (17.1)	804(77.8)	-	1 (0.1)	1 (0.1)	-	-	-	-	50(4.8)	-	1033(4.9)
	cistern base	38	2	-	-	4(100.0)	-	-	-	-	-	-	-	-	-	4(0.0)
	unid.	40	1	-	1 (16.7)	1(16.7)	1 (16.7)	-	-	-	-	-	-	3(50.0)	-	6(0.0)
22	privy	41	1,2	-	582 (13.8)	3363(79.5)	71 (1.7)	120 (2.8)	38 (0.9)	-	-	-	6 (0.1)	47(1.1)	1 (0.0)	4228(19.9)
21	privy	42	2	-	-	3(60.0)	-	-	-	-	-	-	1 (20.0)	1(20.0)	-	5(0.0)
			9	-	23 (4.5)	309(60.6)	-	52 (10.2)	31 (6.1)	-	43 (8.4)	-	1 (0.2)	51(10.)	-	510(2.4)
	privy	43	1,2,3	3(1.6)	3 (1.6)	122(66.7)	-	4 (2.2)	2 (1.1)	-	-	-	0 (5.5)	39(21.3)	-	183(0.9)
			9	-	-	55(78.6)	-	5 (7.1)	4 (5.7)	-	-	-	1 (1.4)	5(7.1)	-	70(0.3)
	privy	44	1	-	1 (5.0)	19(95.0)	-	-	-	-	-	-	-	-	-	20(0.1)
			9	-	-	8(100.0)	-	-	-	-	-	-	-	-	-	8(0.0)
	drain	46	1	-	7 (87.5)	1(12.5)	-	-	-	-	-	-	-	-	-	8(0.0)
20	privy	47	2	-	-	26(55.3)	-	1 (2.1)	5 (10.6)	-	-	-	2 (4.3)	13(27.7)	-	47(0.2)
	privy	48	1,2	-	-	66(65.3)	31 (30.7)	1 (1.0)	2 (2.0)	-	-	-	1 (1.0)	-	-	101(0.5)
	cofferdam/box	49	1,2,3	-	83 (2.4)	2997(86.9)	4 (0.1)	323 (9.4)	9 (0.3)	-	-	-	1 (0.0)	31(0.9)	-	3448(16.2)
19	(privy	50	1	-	88 (21.4)	286(59.4)	1 (0.2)	1 (0.2)	3 (0.7)	-	-	-	-	33(8.0)	-	412(1.9)
18	privy	51	1,2	-	134 (23.3)	300(52.1)	1 (0.2)	64 (11.1)	22 (3.8)	-	5 (0.9)	3(0.5)	1 (0.2)	46(8.0)	-	576(2.7)
			9	-	-	2(100.0)	-	-	-	-	-	-	-	-	-	2(0.0)

(continued)

In general, the macro-floral data confirm the organic-trash matrix of the fill initially used to make the 175 Water Street block and, approximately 100 years later, to ultimately fill the nineteenth-century occupation features represented in this analysis. This is in addition to the analogous trash that accumulated within the features over time.

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LEATHER

(Lisa A. Goldberg)
(based on a data system organized by Steven Nicklas)

Introduction

The 175 Water Street site is particularly rich in scrap leather, shoes, and shoe parts. The quantity of scrap types in original fill supports evidence for an early leather industry in proximity to landfilled areas of lower Manhattan. Shoes and shoe parts recovered from the site will potentially yield information concerning the nineteenth-century mechanization of the shoe industry. In addition the repair, re-use, and wear patterns can reveal information concerning the construction and use of these items. For this reason, a discussion of shoe construction is presented in this report (see below).

Leather production and use involves a complex set of steps including the preparation of animal skins, the shaping of leather pieces and the assembly of these pieces. The manufacture of tanned leather objects includes aquisition, shaping, tooling, and fastening of pieces. Each of these processes produces different types and varying quantities of scrap leather and object parts. Re-use of parts further enhances the possible diversity of artifact types. Scrap types and artifact construction yields information about manufacturing techniques, style, and artifact assembly.

The following discussion describes how partial artifacts were dealt with and where concentrations of these artifacts were found. A non-quantified discussion of style and construction is presented to describe some of the untabulated aspects of the collection and to suggest directions for further research.

Methodology

Most recovered samples from the site remained damp and cold in the initial post-excavation phase. These artifacts were gently washed, systematically photographed in catalogue number groups, and then submerged in water. Prior to tabulation and analysis, one to one drawings of all leather artifacts exhibiting fastenings were rendered. Although documentation by drawing began prior to tabulation, only 30% of all leather loci were ultimately drawn. Of these, a ratio of 27/37 feature to non-feature material was represented. Drawings of unsampled items from the ship were rendered for preconservation records. Unique items exhibiting style or singularity ultimately will be drawn as a record.

Tabulation proceeded by catalogue number as washing progressed, but these tabulations did not distinguish between feature and non-feature material. Only sampled material was tabulated from the ship collection. An attempt was made to record all material from the yard excavations, however, this was not fully accomplished (see Leather appendix A).

Leather artifacts were tabulated according to artifact codes determined by functional categories. The last digits of each code were sub-divided by type, style, or part as related to the functional group. For example, "L" describes all leather and "A" describes shoes. Sub-divisions include listings for shoe parts such as vamp, counter, heel sections (these were further divided by number of parts), etc. (see translations for descriptions). Matching shoe parts were assembled and each shoe was coded as a "unique" item. Unique shoes were described by three or more associated shoe parts. Codes for cut scrap were divided by shape, such as strips, triangles, squares, rectangles, and ovals. Two irregular cut scrap categories were designated. "Irregular with cow udder" was characterized by scraps of uneven thickness with "nipple like protrusions and occasional hairs" (Nicklas 1982: personal communication). "Irregular cut scrap" included irregularly shaped scraps discarded after shaping objects as well as scraps of irregular thickness skived (or shaved) from the surface of a partially or completely tanned piece of leather. Fragments were grouped by size. Fragments with eroded edges of indistinguishable form and function were described as "flat irregular fragments". Crumpled, crumbled, and degraded pieces were distinguished as "crumbled irregular fragments". This category seemed to include bits which had become disengaged from cracked but finished leather, clumps of very degraded leather, and clumps of skived leather. A skived fragment category was added late in the tabulation process.

Details concerning each artifact were described in several ways. Leather belonging to each code was classified by count, material, and construction. To distinguish between piece count and shoe assemblage, a minimum vessel count (MNV) was established. Often, the artifact code was particularized to allow for one minimum vessel per locus per code. Pieces of the same type or shape were counted together and then coded in the MNV column. Material description included choices for skin type: cowhide, pigskin, and leather (e.g., unknown or unidentifiable skins). Decisions about skin type were made by observed texture. Construction details were described by listing the various materials used in joining several pieces of leather including wood, thread, and iron. Fastenings were determined by the presence of corroded iron or wood as well as the size and shape of tooled holes. For shoe and shoe parts, patterns of distortion, wear, and degradation were noted to record left and right orientation.

After tabulation, unique and exemplary pieces were chosen for conservation while most scrap and degraded leather was discarded. Other pieces (including some scrap) were frozen in water for future study. Dry leather was simply stored. Following the establishment of a conservation facility, all leather remained in water for in-house treatment and reference.

Leather from 175 Water Street

Five-thousand and two pieces of leather were tabulated from approximately 216 loci containing leather material. Sixty-five percent of all tabulated leather was feature material; 43% of all tabulated leather was from the yard excavations while 22% was fill found in the ship hull. Twenty of the 43 features represented in the sample contained less than 50% shoe parts and more than 50% scrap leather. Twelve of the non-feature units contained over

50% scrap leather as well. Feature units from the yard excavations produced variable leather counts distributed over a wide range of categories. With the exception of Features 31, 41, and 49 as well as deeptests 55 and 56, the lowest levels of the feature/unit contained the largest leather quantities. Seven feature levels containing leather were identified as primary landfill layers. In only five feature levels were more than 25% shoe assemblages identified. Leather in many of the features with low leather counts consisted of fragmented shoe parts, cut scrap, or occasional loose shoe parts.

Leather artifacts were recovered from nineteen non-feature deposits. Seven of these contained eleven pieces or less by count. Five of the non-feature deposits with large amounts of leather were characterized by equivalent percentages of cut and crumbled scrap as well as high quantities of shoe assemblages. Identified shoes were found mostly in units with higher leather counts. Non-feature deposits with very little leather consisted of mostly scrap leather. Percentages and counts for cut scrap, fragmented scrap, shoe parts, and shoe assemblages for all features are listed by feature designation in Leather Table 4.83. A detailed discussion of the leather recovered from seven features will be presented here. These include two privies, one box, one box/cofferdam, a pit, and two deeptests.

Feature 2

Although very little leather was located in levels 1 and 2 of Feature 2, a privy in Lot 33, forty-nine pieces were tabulated from Level 9, the feature's original landfill level. A waist found in this level was gouged with two zig-zagging cordwainer's marks (Figure 4.14e). One shoe from this level, represented by an eight-part assemblage, may have been re-used as a slipper since its quarters were squashed. The outside of this shoe was also half-soled (or recut) with a narrow triangle cut from the central sole section.

The percentage of scrap leather in the non-feature matrix for Lot 33, Units 5/7 in which Feature 2 which was located was 66.7%. High levels of scrap leather in this fill were distinct from feature layers. Similarly, high levels of shoe parts in the primary landfill-level within Feature 2 separated landfill and feature material.

Feature 30

Again, leather percentages increased with depth in Feature 30, a box in Lot 32. While no leather was located in level 1, four pieces of crumble scrap were found in level 2 and a small amount of untabulated leather was also identified in level 3 (see Leather Appendix B). Level 4 contained 33 pieces of leather with shoe leather constituting 93.9%. The majority of this shoe leather consisted of fragmentary upper, sole, and heel pieces. Although the non-feature matrix contained substantially more leather, with a piece count of 68, only 40% was scrap leather. Shoe leather was mostly crumbled shoe parts. This indicated the non-feature matrix was also rich in well-worn shoe parts (45 fragments), despite its lower percentage of these parts.

Feature 34

In the "pit" feature in Lot 23, leather finds were restricted to levels 3 and 4. Level 3 contained much more leather, with a piece count of 94, as compared to 2 pieces in Level 4. Despite differences in amount, most was identified as shoe leather. In level 3, shoe parts (55) accounted for nearly five times as many pieces as shoe part fragments. While no scrap appeared in Level 2, most of the scrap leather in level 3 was identified as crumbled fragments.

The non-feature material for Unit 4 in Lot 23, where Feature 34 was located, contained more scrap and a larger proportion of fragmented shoe parts than the "pit" feature. Shoe leather included six half-soled pieces and four unique shoes. Larger quantities of cut scrap and fragmented shoe parts separate feature and non-feature material in this unit.

Feature 41

Leather was found in all four levels of Feature 41, a privy in Lot 22, with an even distribution through available catalogue numbers. However, significantly less leather was located in level 1 while level 2 contained the largest count of leather pieces (115) from the feature and the lowest percentage of shoe parts (63.5%, as compared to 77.8% found in 41.9). In levels 1 and 2, equivalent quantities of crumbled scrap were located. Level 2 contained the highest percent of cut scrap, identified mainly as "irregularly cut" it also had the most shoe assemblages and loose shoe parts. While 41.1 and 41.9 were represented by much less scrap leather, the percentages of fragmented shoe parts were higher in both levels. Non-feature material for Unit 22.02 contained much less leather and consisted of only cut and crumbled scrap.

Feature 49

The leather count decreased with depth in Feature 49, a box/cofferdam in Lot 20 (see Landfill Chapter 5). Level 1 contained 3 pieces of crumbled scrap and 73 mainly fragmentary shoe parts. From 5 shoe assemblages recovered from level 1, a left and right pair were located. Lower levels 49.2 and 49.3 produced 5 pieces of scrap and 1 crumbled scrap fragment.

Deeptest Feature 55

The deeptest in Lot 30, Feature 55, contained the highest feature percentage of leather in level 2. In all levels, the percentage of recovered shoe material was below 31%. In fact, the percentage of shoe parts and fragments decreased with depth. All levels contributed some cut scrap, ranging from 7% to 42.1%. The lowest three levels also produced some irregular scrap with counts ranging from 2 to 11 pieces. However, all levels also contained large quantities of skived and crumpled irregular fragments, with percentages ranging from 46.2% to 65.5%. Level 2 contained 50.4% crumbled leather (in addition, 38.9% were skived fragments). Level 55.2 also contributed a substantially higher count of leather by piece (442 pieces, as compared to between 54 and 65 in other levels). While level 55.2 contained the highest combined percentage of scrap leather, that of combined shoe parts is lowest in this level.

Shoe material from levels 1 and 2 consisted mainly of intact, unassembled shoe parts. Two shoe groups were identified in each of these levels as well. However, level 3 consisted mostly of shoe fragments and also contained the highest feature percentage of crumbled and eroded fragments (65.5%). Level 4 also contained little shoe material.

Deeptest Feature 56

Again, the first two levels from the deeptest in Lot 29, Deeptest Feature 56, contained the highest percentage of leather by piece count. Both levels contained equivalent percentage of cut leather. Like Feature level 55.2, 56.2 contained considerably more leather than other levels (980 pieces, as compared to 309 in 56.1, 29 in 56.3, and 51 in 56.4). Although the number of pieces in levels 1 and 2 were different, the percentages of scrap (64.7%-67.3%) and shoe parts (5.8%-6.8%) are comparable. In addition, level 56.1 had more skived scraps (70 pieces) while level 56.2 contained a large quantity of irregular cut scrap (178 pieces). Three pieces of leather were also identified as "irregular with cow udder" in level 56.2. These pieces can probably be associated with the preparation of skins for tanning, if not the tanning process itself (see Cat. #8159).[2] Levels 56.1 and 56.2 seem to contain high percentages of skived and degraded leather, possibly associated with Feature 55.2 and nearby tannage refuse.[3]

In level 1 and level 2, unassociated shoe parts accounted for most of the identified shoe material. One unique shoe was located in 56.1 and three assemblages were located in 56.2 This latter level had a larger number of loose shoe parts to accompany the increase in identifiable shoes.

The lowest two levels of Feature 56 contained less leather with 29 pieces identified in level 3 and 51 pieces classified in level 4. Although these levels retained a high percentage of crumbled and crumpled leather (58.6% and 29.4% respectively), no skived leather was identified and only four pieces of irregularly cut (possibly skived) leather were found in level 4. More unworn, cut scrap was found in 56.3 than in 56.4. These lower scrap counts were accompanied by an increased level of shoe parts in 56.4, totalling 47.9%, as compared to low counts in the upper levels. Only one shoe part was recovered in level 3.

Ship Sample

In general, the leather from the ship sample contained less scrap than non-feature or feature collections from the yard excavation (see Leather Table 4.85). While the ship fill from two or three lots contained 30-50% cut scrap, precentages of crumbled and degraded scrap were considerably lower. Very little irregular cut or skived material was recovered. In reverse, the percentages and count of unassociated shoe parts and shoe assemblages seemed to be higher in ship material than in most of the feature and non-feature yard material. Undoubtedly because of the sampling strategy, where only every tenth bucket of fill was considered in the sample, the sampled collection of leather from the ship was also smaller by count than that from the yard excavations.

Ship material from Lot 32 (703SH), Lot 34 (705SH), and Lot 35 (707SH) all contained relatively large quantities of leather and relatively high percentages of scrap leather.

Equivalent amounts of shoe parts and shoe fragments were located in Lot 32, but Lots 34 and 35 contained more shoe parts. The number of insoles (7) and outsoles (15) recovered were unmatched anywhere on the site. Ship excavation units in Lot 31 (702SH) and 33 (705 SH) contained comparable amounts of leather by count. These two features also contained equivalent percentages of fragmented scrap. However, the percentage of cut scrap in 702SH was higher than 705SH. Furthermore, 702SH produced similar percentages of matched shoe parts and loose shoe parts while 705SH contained similar numbers of fragments and unassembled shoe parts. No whole shoes were located in 705.

Fill units in Lot 33 (704SH and 708SH) contained very little leather. Three assorted shoe parts were recovered from the former while the later consisted of mostly crumbled scrap and degraded shoe fragment. Unsampled shoe material recovered from these lots could yield further information concerning the nature of the leather collection in these fill deposits. Although untabulated, several characteristics were observed in the unsampled material. A large number of shoe assemblages are indicated in the non-sampled matrix. Many of these shoes are large with rounded or pointed toes and have very little last. A mask, two arm bands and a tooled bottom were also identified in the non-sampled but saved assemblage.

Further examination of feature and non-sample shoes could yield a wealth of data concerning shoe construction, wear, and style. These data would compare well with feature and non-feature material from the yard excavations.

Non-shoe material recovered from both yard excavations and ship units include 20 belt fragments, 1 bag fragment, 1 button face, 9 glove fragments, 6 hinges, 1 book cover fragment, and 10 unknown or unidentified pieces. The scarcity of these artifacts was affected by the fill nature of the site and fragility of items like gloves, book covers, and bags.

Comments on Style and Construction

Scrap Leather

Scrap leather includes degraded, skived, and cut scrap discarded during the various steps of leather tannage. Although cut scrap was carefully tabulated, degraded, skived and crumbled scrap types were not distinguished. The tanning process includes the preparation of skins for immersion in tanning agents or liquors. The manufacture of pre-tanned skin includes flaying, soaking, unhairing, fleshing, skudding, deliming, splitting, and pickling of pelt (Reed 1972). Several of these steps produce quantities of scrap-skin shaved from various skin layers. The three pieces in 56.2 identified as "irregular with cow udder" could be associated with skin preparation (see Discussion of Feature 56 above). Prepared skins are then soaked in tanning agents which can include sulfonated oils or vegetable tannins or a variety of other methods.[4] Tanning techniques and agent pH

affect the quality of the leather, and thus the level of preservation (Anon. 1936). Fragmentary, crumble scrap, and degraded scrap may reflect the tanned quality of the leather in separated skin layers.

Degraded scrap was generally soft and slimy in texture and fibrous on one or both surfaces. The leather substance was also fragile near its frayed edges. Skived leather was thin, crumpled and often uneven in thickness. Since skiving and shaving occur at several stages in the tanning process, skived fragments would probably vary in presevation, depending upon when they were produced.

Shoe Leather[5]

Most of the shoe and shoe parts examined were made with the grain side out and flesh side in. Occassionally, a counter or waist was noted with the flesh side out. Although Reed claims that it is impossible to identify tanned skin type without a microscope, several grain patterns were noted.[6] Further examination of upper shoe parts might help to clarify the diversity of skin types and tanning techiques used in construction of these shoes. All shoes and heels seemed to be from a thick, fairly inflexible leather which was tabulated as cow-hide.

In general, all shoes and shoe parts exhibited wear. Fragmented shoe parts were both worn and eroded. Un-assembled shoe parts were often damaged by erosion and other degradation of worn areas. Soles were usually impressed with pressure points corresponding to ball, heel, toe, and arch areas. These impressions and worn areas made right and left determination possible. Both vamps and counters also exhibited bulges and worn areas, with crumbling concentrated in places that had been stitched. Heel segments and heel assemblages were most often worn on one side or end, giving the heel pieces variable thickness.

Cut fragments generally showed no wear. However, degraded scrap with straight cut edges and unworn grains was recovered. The grain texture of most cut scrap was often evident and the leather reatined a flexibility inherent to the thickness of the piece. Cut fragments were made mainly of leather similar in texture to that of heels and soles. Triangular and strip-shaped pieces often retained the shape of the perimeter they were cut from. One piece (Cat. #3016) exhibited gouges across the grain side. These gouges were interpreted as possible cordwainers marks (Figure 4.14e). This scrap was probably a re-used piece.

Several soles and heels appeared to show signs of reuse or repair. These pieces were cut across the foot diagonally or laterally. Most recovered and recorded half soles exhibited no stitching on the face of the fresh cut. In these examples, the missing section was probably used to repair another shoe. Although repair was not tabulated, most half soled pieces seemed cut from outsoles. Several half soled heel sections were identified as both outer heel segments and inner heel lifts. These pieces were possibly re-pegged to the repaired shoe.

Most of the recovered leather heels and heel segments were pegged together with tapered wooden pegs (see Figure 4.14a). The majority of the pegs were concentrated around the perimeter of the heel but others were patterned in the center. Although many central pegging patterns appeared to be random, several distinctive and singular patterns emerged (see Figure 4.14b&c). An example of an unusual design can be seen in Figure 4.14b. An example of a cross located on the heel section of an outsole can be found in Cat. #8081 and a pegged "x" can be seen on a heel from Cat. #5195. Other pegging patterns in heel segments may have been obscured by wear, partial penetration of pegs through all layers, and the addition of holes for repair work.

Along the perimeter, most of the heel peg holes seemed even in size and distribution. However, heel segments from deeper levels and earlier fills seemed to show variations in size and pattern of outer row holes. These heels sometimes exhibited double rows of pegs (as seen in Cat. #435). Hole sizes were often uneven, suggesting they had been hand awled. Since the development of standardized peg blocks and a pegging machine occurred during the first half of the nineteenth century (Anderson 1968), a more complete study of pegging patterns might be called for.

Very few heels were fastened with nails. Nails were rarely noted in central portions of leather heels. However, a few wooden heels appeared to be fastened to the shoe with small nails on the top, side, and bottom surfaces.

The percentage of recovered wooden heels was small in comparison to the quantities of leather heel segments and assemblages recorded. Only high wood heels were observed. Most of the wood heels tapered sharply from the seat of the heel to its middle, leaving a substantial base to stand upon.

Several other wood heels tapered to a narrow base at the bottom (see Cat. #568). Most of the wood heels were worn on one side or the other. Two leather heel coverings for high heeled shoes were also indentified (Cat. #5111 and 8196). The heel covering found in association with its wood retained a leather band to tie the heel and shoe waist together.

Waists and arch supports were constructed in two ways. Waists for high heeled shoes exhibited fine stitching along the sides and at the end of its curled and narrow throat. Several small holes were also scattered over the body of the waist to fasten it to the soles. These curled waists were generally constructed of a thicker leather, occasionally with the flesh side out. Other identified waists or lasts were cut with less taper and exhibited no cure at the throat. More often these pieces were fastened with several strategically placed pegs or stitches. These lasts sometimes exhibited stitching across the ends or on the sides. Small circular or elongated arch supports and lasts were constructed with holes to fasten the piece to the arch portion of the sole. Many of the smaller arch supports were also thinner around the edges than in the center. Since lasts and arch supports were placed between the soles and were fastened to the insole, many insoles and outsoles retained impressions of arch supports and lasts.

Insoles and outsoles exhibited both stitched and pegged patterns. Insoles showed fastening marks of several types. Many insoles were planed back from the perimeter to form a ridge or rib (see Figure 4.15b). A groove or channel was then feathered around the inner edge of this ridge to create space for the thread to lie. On most shoes, the stitch holes were found parallel to the plane of the leather, or through the substance of the ridge. (for example, Cat. 5345). On other insoles, the stich holes were found on the slope of the ridge. When no ridge was present, these holes pierced through to the inner surface of the insole. A welt would sometimes be fitted in the space between the ridge and the edge of the sole. Several insoles also exhibited a scattering of small stitch holes at the toe and instep. On early examples, several insole and outsole and waist pieces exhibit diagonal and zig-zag stitch impressions. These cordwainer's threads were used to hold the vamp to the insole until the outsole was sewn. Cordwainer's marks were found most frequently in the ship fill material and the lowest levels of feature and non-feature material (see Figure 4.14e and Cat. #3019). Almost all outsoles were pierced with a series of holes around the perimeter. These holes are similar in shape and size to holes located in vamp, counter/quarter, and welt pieces. Although slightly more oval in character, these holes are also similar to peg holes found in heels. The outsole was then stitched to the welt or the counter quarter and insole combination (see Cat. #5301 and Figure 4.15c). Stitch and peg patterns often change at the heel end of the shoe where the innermost heel section, or rand, was on occassion sewn to the sole (e.g., Cat. #8086). Several outsoles also exhibited a feathered groove for thread placement on their inner surface.

Most of the recovered vamps were constructed with side flaps and a throat flap over the instep. One example of a vamp without a frontal flap was recovered from Cat. #5239. Another example of vamp with a shortened frontal flap and long tapered wings or sides was recovered from Cat. #429. The shape of the vamp tip varied, depending upon the shape of the sole. Pointed toe vamps were often folded over at the tip to create a point and were supported by an internal toe reinforcement. Other round toe vamps were stitched around the toe and were sometimes also supported by a toe reinforcement. Lateral stitch marks appeared across the tips of several repaired toes. Vamps with throat and side flaps were joined to quarter and counter pieces by diagonal overstitching and stiches through the substance on either side. These vamps were sometimes accompanied by strapped counter or quarter pieces.

Counters and quarters were generally abutted together at the heel midpoint and were sewn through the substance of the leather. Top bands were not noted on any counters or quarters. Very few counter/quarter pieces exhibited indentations due to overstitching on their uppermost edge. Fine stitching was noted on the top of one quarter fragment from Cat. #8043. When not equipped with a strap, most quarters exhibited stitchmarks across their narrow end for the attachment of a strap or latchet (see Cat. #8115). Both buckle and button-scarred straps were noted with several recurring end shapes. The ends were often squared, rounded, or cut to a point. Examples existed in Cat. #442, 5114, and 8332. Single possible buttonhole slits were located near the tips of several straps. One strap with slits was located in the ship fill. No straps with large or numerous tie holes were observed. Although a number of counter and quarter pieces were located, comparatively few latchets and straps were found.

Shoe sizes were not recorded, but many soles were measured across the ball and the length of the foot. This information can be found in the comments section on the tabulation forms. One to one drawings of soles also provide similar information in a more complete way. Most very large shoes were rounded at the toe. The most common soles ranged from 6-10 inches in length, but several baby shoes were recovered (Cat. #5145, 8049 and 3012).

Most shoes were styled with pointed tips or pointed, semi-pointed, or rounded toes (see Figure 4.15). Many of the shapes are datable in addition to revealing construction considerations. The wide variety and quantity of pointed and round-tipped styles can be explained by the appearance and popularity of sharp-toed shoes after 1736 (Anon. 1937); pointed toes for women were again popular in the 1790s. Sharp toes were more common in soles with little or no last (see Figure 4.15b). Shoes with the heaviest construction (in leather weight, etc.) seemed to have rounded toes. Further investigation of toe shapes and last cuts could yield information about the relationship of style and mass to shoe construction.

Box, or square-toed shoes, such as an example for Cat. #5139 (see Figure 4.15d), were most popular in the late-seventeenth century (Grimm 1970). A wing-tipped sole fragment from Cat. #5349 (see Figure 4.15) and another from Cat. #2007 are also possible examples of chronological type.

Impressed stamps are identified on two leather pieces. In Cat. #5226, a piece of cut scrap was found with the impression of four lines, enclosed within a rectangle. This stamp appeared to be partial and the leather unworn. A second stamp in the shape of a twelve-petaled flower was located on the inside surface of the outsole of a shoe assemblage in Cat. #545 (see Figure 4.14d). These stamps could have served two purposes. Prior to mass shoe production, sole leather was stamped with a manufacturer's mark. An example of such signature labelling was found on the Defense. (Seifert and Smith 1982: personal communication). According to Stokes (IV 1922:804), an act was passed in 1770 requiring inspection quality control taxation and the marking of all sole leather manufactured in New York City. Further investigation of these two stamps and their relationship to other leather stamps could yield more information concerning leather and local leather manufacture.

Summary

The concentrations of scrap and shoe leather in several features suggest local leather manufacture. Deeptests 55 and 56, both original fill samples, yielded similar quantities of leather types in their respective levels, perhaps corresponding to nearby tannage refuse. In general, more scrap leather was found in landfill levels than features levels. Although aspects of the shoe collection from the site revealed both handmade and possibly mass made shoes, no quantitative study of last, style, or construction was conducted. Detailed observation of last and toe shapes could provide information about style and dress. Examination of insole, outsole, and leather heel construction might establish when the machine stitched and pegged shoe became popular in Historic Manhattan. And finally, further examination of reused leather, stamped leather, and skin types could yield information concerning the production and worth of leather products in the eighteenth and nineteenth centuries.

Notes

[1] For a brief discussion of the invention of pre-cut peg blocks and an automatic pegging machine in the first half of the nineteenth century, see How Shoes are Made (Anon. 1937). The McKay stitching machine was invented between 1858 and 1862 (Anderson 1968). This machine sewed a chainstitch through the soles and uppers. In the 1870s, the Goodyear weltstitching machine was invented as well.

[2] In the pretanning process, the unhairing and liming liquors remove some of the hairs and swell the dermal network making it "firmer and more springy" (Reed 1972:59). Hairs and dermal layers are then removed physically. The pelt is then scudded to remove any excess hairs and dirt. Fine deep seated hairs sometimes . . . give rise to a defect known as short hair since they may persist after unhairing and scudding and may be carried through to the final leather stage (Reed 1972:24).

Descriptions of dehaired limes or swelled skins and S. Nicklas' description of "Cow Udder" scraps seem to point towards identification of these scraps as beamhouse, or pre-tanned scraps.

[3] A map of "Shoemaker's Land" indicates that tanning pits might have been located near Maiden Path and William Street (Valentine 1853:278).

[4] Any reference describing tanning techniques will explain the details of oil and vegetable tannage. Modern Shoe Dressings is one such reference (John 1934).

[5] In preparing the discussion of shoes, several references were consulted in addition to those cited. Among these are Brooke (1971), Hall (1847), Thornton (1975), Wilcox (1948), and Wilson (1974/1969).

[6] " . .with leathers of archaeolgoical or unknown origin, great care must be taken when examining the grain pattern before deciding which animal species orignially provided the raw materials. The examples shown were photographed under x 10 magnification. I observed all grains noted (e.g. calf, goat, cattle, and sheep), but these were only visible under very good light. Most of the leather was coded as cowhide, and I believe that a good number of the upper shoe parts were made from a variety of other materials . . ." (Reed 1972:25-27). Reed also notes that bull skins were used for sole leather and that bovine skins vary in grain and texture.

Figure 4.14
175 WATER STREET

Leather
Shoe Heels, Stamp, and Cordwainer's Marks

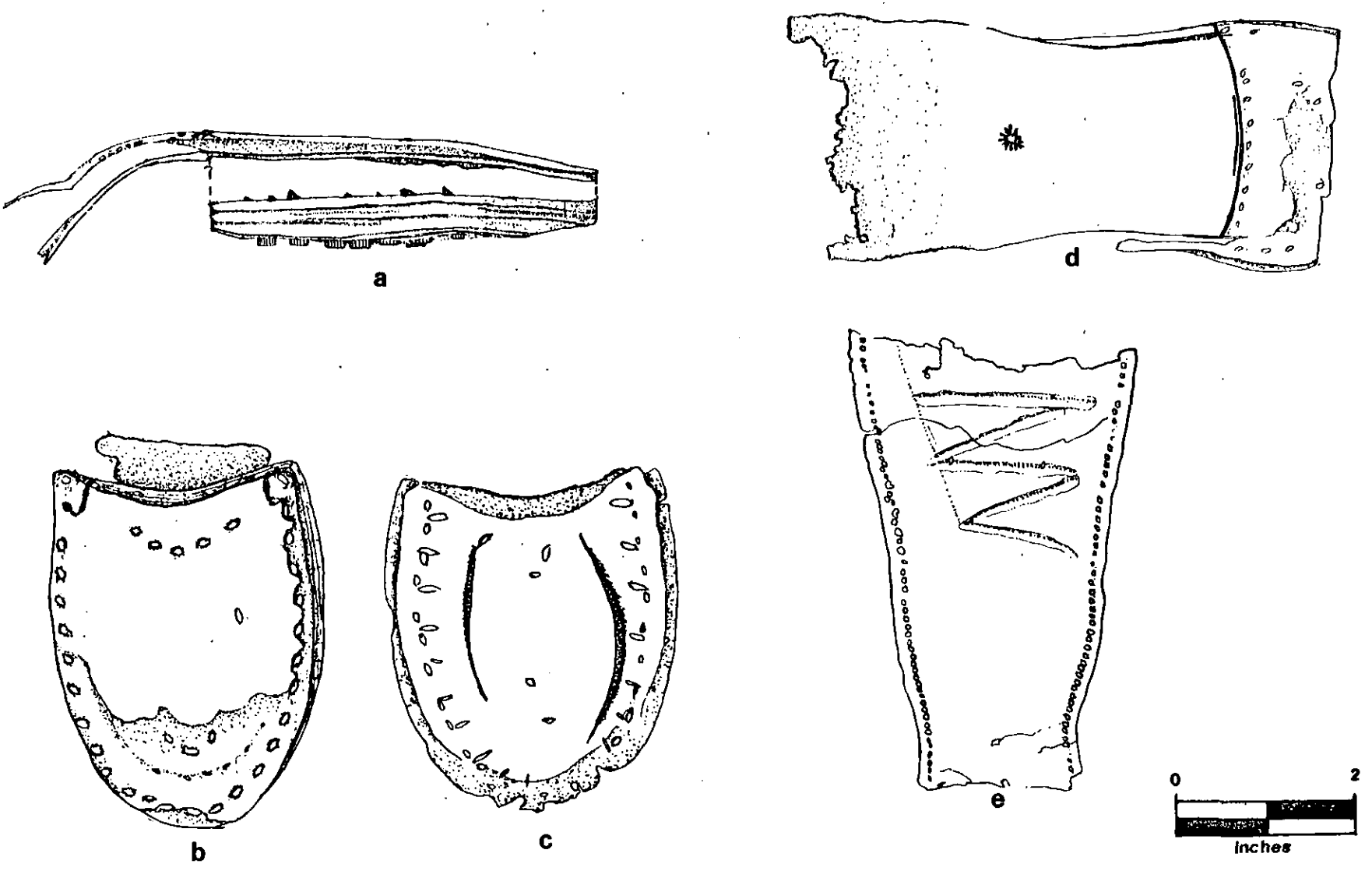
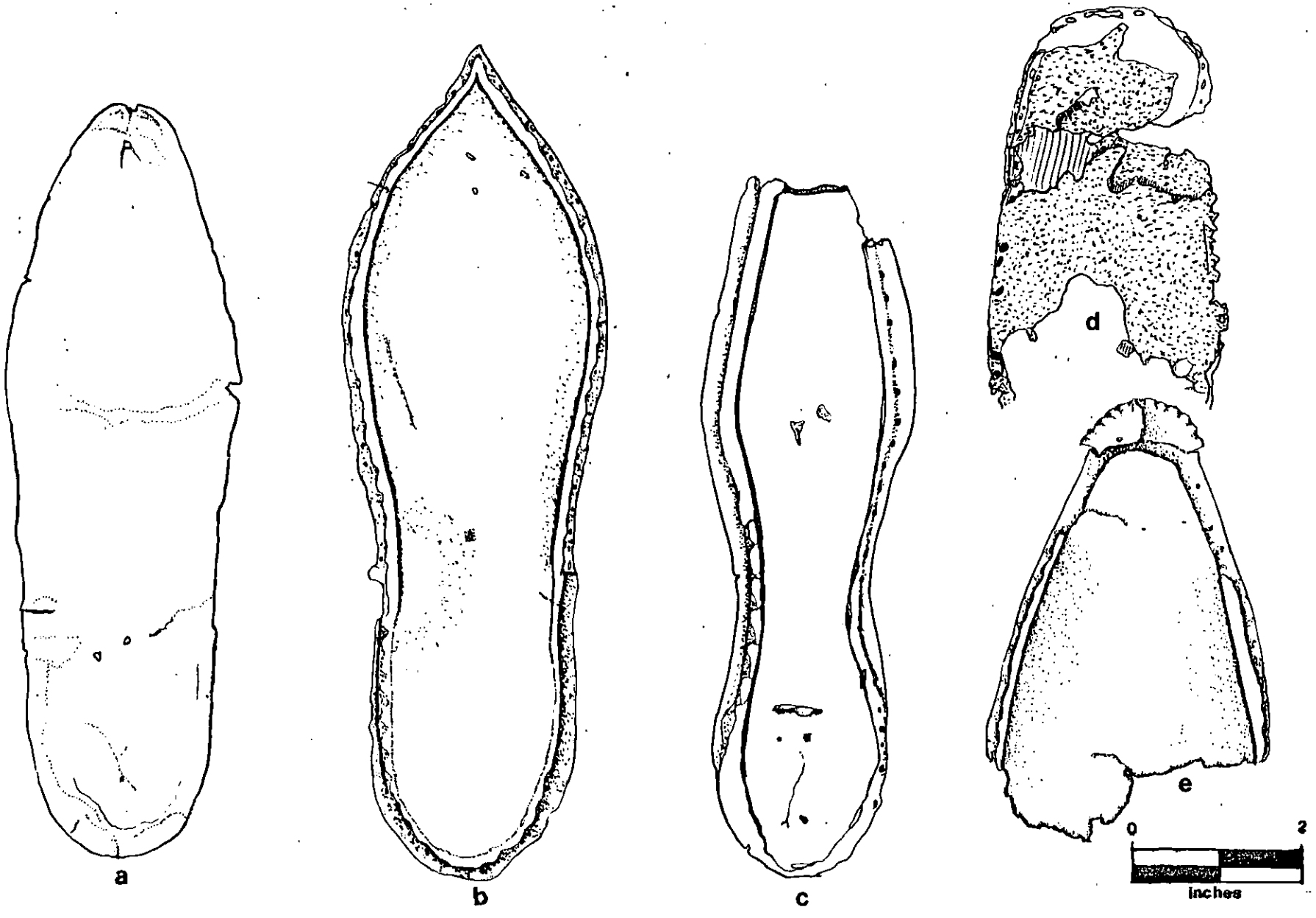


Figure 4.15
175 WATER STREET

Leather
Shoe Soles



Leather Table 4.83 175 WATER STREET: Yard Excavations

Lot #	Feat. #	Feat. Level	Site #	Leather %	Cut Scrap #	Cut Scrap %	Crumbled Scrap #	Crumbled Scrap %	Shoe Fragments #	Shoe Fragments %	Shoe Parts #	Shoe Parts %	Identified Shoes # of Parts	Identified Shoes %	MNV	Other #	Other %
36	1	1	20	(.4)	3	(15.0)	12	(60.0)	2		3		-	-			
		2	183	(3.7)	54	(35.5)	85	(46.5)	11	(6.0)	13	(7.1)	9	(4.9)	2	1	(6.5)
		9	131	(2.6)	61	(46.6)	58	(44.3)	3	(2.3)	-		8	(6.1)	1	1	(0.8)
33	2	1	2	(0.0)	-		-		1	(50.0)	1	(50.0)		-		-	
		2	5	(0.1)	2	(40.0)	-		2	(40.0)	1	(20.0)		-		-	
		9	49	(1.0)	7	(14.3)	9	(18.4)	6	(12.2)	4	(8.2)	24	(46.9)	2	-	
	3	9	16	(0.3)	1	(6.3)	-		9	(56.3)	4	(25.0)	2	(12.5)	1	-	
	6	1	7	(1.0)	-		-		1	(14.3)	6	(85.7)		-		-	
	23	1	1	(0.0)	1	(100.0)	-		-		-			-		-	
32	30	2	4	(0.1)	-		4	(100.0)	-		-			-		-	
30		2	33	(0.7)	2	(6.1)	-		15	(45.5)	8	(24.2)	8	(27.2)	1	-	
23	31	1	28	(0.6)	5	(17.9)	2	(7.1)	6	(21.4)	1	(3.6)	14	(50.0)	1	-	
		2	1	(0.0)	-		-		-		1	(100.0)		-		-	
32	32	2	1	(0.0)	-		-		1	(100.0)	-			-		-	
	34	3	94	(1.9)	3	(3.2)	19	(20.2)	12	(12.8)	35	(37.2)	25	(26.6)	2	-	
		4	2	(0.0)	-		-		1	(50.0)	1	(50.0)		-		-	
		1	8	(0.2)	3	(37.5)	3	(37.5)	-		-			-		2	(25.0)
22	41	1	17	(0.3)	1	(5.9)	3	(17.6)	6	(35.3)	3	(17.6)	4	(23.5)	1	-	
		2	115	(2.3)	23	(20.1)	18	(15.7)	11	(9.6)	29	(25.2)	34	(29.6)	4	-	
		9	54	(1.1)	4	(7.5)	2	(3.7)	12	(22.2)	7	(13.0)	23	(42.6)	2	6	(11.1)
21	42	9	21	(0.4)	13	(61.9)	5	(23.8)	3	(14.3)	-		-			-	
	43	3	2	(0.0)	1	(50.0)	-		1	(50.0)	-		-			-	
		9	2	(0.0)	-		-		2	(100.0)	-		-			-	
	45	1	8	(0.2)	3	(37.5)	-		4	(50.0)	-		-			1	(12.5)
20	47	2	1	(0.6)	-		-		1	(100.0)	-		-			-	
	48	9	1	(0.0)	-		-		-		1	(100.0)	-			-	
	49	1	76	(1.5)	-		3	(3.9)	21	(27.6)	4	(5.3)	46	(60.5)	5	2	(2.6)
		2	4	(0.1)	3	(75.0)	1	(25.6)	-		-		-			-	
		3	2	(0.0)	2	(100.0)	-		-		-		-			-	
19	50	2	3	(0.1)	-		-		-		3	(100.0)	-			-	

(continues)

Leather Table 4.83 (continued)

Lot #	Feat. #	Feat. Level	Site #	Leather %	Cut Scrap #	Cut Scrap %	Crumbled Scrap #	Crumbled Scrap %	Shoe Fragments #	Shoe Fragments %	Shoe Parts #	Shoe Parts %	Identified Shoes # of Parts	Identified Shoes %	MNV	Other #	Other %
18	51	1	18	(0.4)	5	(27.8)	9	(50.0)	1	(5.6)	3	(16.7)		-			-
		2	32	(0.6)	16	(50.0)	0		8	(25.0)	7	(21.9)				1	(3.1)
	52	1	1	(0.0)	1	(100.0)		-		-		-		-			-
		2	4	(0.0)	2	(50.0)	2	(50.0)		-		-		-			-
	53	1	3	(0.1)		-		-		-		-	3	(100.0)	1		-
	55	1	65	(1.3)	5	(7.7)	30	(46.2)	1	(1.5)	20	(30.8)	6	(9.2)	2	3	(4.6)
		2	442	(8.8)	186	(42.1)	223	(50.4)	4	(0.9)	12	(2.7)	15	(3.4)	2	2	(0.4)
		3	58	(1.2)	3	(5.2)	38	(65.5)	11	(18.9)	1	(1.7)	5	(8.6)	1		-
		4	54	(1.1)	18	(33.4)	30	(55.5)	3	(5.6)	3	(5.6)		-			-
29	56	1	309	(6.2)	82	(26.5)	208	(67.3)	1	(0.3)	7	(2.3)	10	(3.2)	1	1	(0.3)
		2	980	(19.6)	279	(28.4)	634	(64.7)	11	(1.1)	24	(2.4)	32	(3.3)	3		-
		3	29	(0.6)	11	(37.9)	17	(58.6)		-	1	(3.4)		-			-
		4	51	(0.1)	12	(23.5)	15	(29.4)	8	(15.7)	4	(7.8)	12	(23.5)	2		

Leather Table 4.84 175 WATER STREET: Non Feature Leather

Lot #	NF# and Unit #	Site #	Leather %	Cut Scrap #	Cut Scrap %	Crumbled Scrap #	Crumbled Scrap %	Shoe Fragments #	Shoe Fragments %	Shoe Parts #	Shoe Parts %	Identified Shoes # of Parts	Identified Shoes %	MNV #	Other #	Other %
	501NF	30	(0.6)	14	(46.8)	10	(33.3)	1	(3.4)	2	(6.7)	3	(10.0)	1	--	
18	(18.02, 18.03, 18.04)															
	502NF	292	(5.8)	105	(36.0)	108	(37.0)	20	(6.8)	7	(2.4)	49	(16.8)	8	3	(1.0)
19	(19.01, 19.02)															
	503NF	28	(0.6)	2	(7.1)	--		10	(35.7)	3	(10.7)	13	(46.4)	2	--	
19	(19.03)															
	504NF	3	(0.1)	--		--		3	(100.0)	--		--			--	
20	(20.01, 20.02, 20.03, 20.04)															
	505NF	6	(0.1)	--		--		6	(100.0)	--		--			--	
20	(20.05, 20,06, 20.07, 20.08)															
	510NF	11	(0.2)	7	(63.6)	4	(36.4)	--		--		--			--	
22	(22.02)															
	516NF	121	(2.4)	23	(19.0)	28	(23.1)	28	(23.1)	18	(14.9)	22	(18.2)	4	2	(1.7)
23	(23.04)															
	517NF	255	(5.1)	70	(27.5)	59	(23.2)	43	(16.9)	35	(13.7)	46	(18.0)	7	2	(0.8)
30	(30.01, 30.02, 30.03)															
	518NF	3	(0.1)	2	(66.6)	1	(33.3)	--		--		--			--	
31	(31.01)															
	519NF	68	(1.4)	7	(10.3)	14	(20.6)	13	(19.1)	17	(25.0)	15	(22.1)	1	2	(2.9)
32	(32.02)															
	520NF	238	(4.8)	83	(34.9)	99	(41.6)	14	(5.9)	14	(5.9)	18	(7.6)	3	10	(4.2)
33	(33.01, 33.02, 33.03, 33.04)															
	521NF	28	(0.6)	10	(35.7)	6	(21.4)	8	(28.6)	1	(3.6)	2	(7.1)	1	1	(3.6)
33	(33.05, 33.06)															
	522NF	8	(0.2)	7	(87.5)	1	(12.5)	--		--		--			--	
33	(33.07, 33.09)															
	523NF	211	(4.2)	87	(41.2)	34	(16.1)	18	(8.5)	20	(9.5)	46	(21.8)	5	6	(2.8)
33	(33.08)															
	524NF	29	(0.6)	2	(6.9)	--		7	(24.1)	10	(34.5)	9	(31.0)	3	1	(3.5)
33	(33.10)															

Leather Table 4.84 (continued)

Lot #	Ship Unit #	Site #	Leather %	Cut Scrap #	%	Crumbled Scrap #	%	Shoe Fragments #	%	Shoe Parts #	%	Identified Shoes # of Parts	%	MNV #	Other #	%
36	525NF (36.01)	93	(1.9)	41	(44.1)	48	(51.6)	2	(2.2)	2	(2.2)	--			--	
14	603NF (14a.0)	129	(0.1)	53	(41.1)	17	(13.2)	18	(13.9)	26	(20.2)	13	(10.1)	2	2	(1.5)
22	609NF (22.0)	1	(0.1)	--		--		--		--		--			1	(100.0)
33	616NF (33.0)	1	(.0)	--		1	(100.0)	--		--		--			--	

Leather Table 4.85 175 WATER STREET: Ship Fill Leather

Lot #	Ship Unit #	Site #	Leather %	Cut Scrap #	Cut Scrap %	Crumbled Scrap #	Crumbled Scrap %	Shoe Fragments #	Shoe Fragments %	Shoe Parts #	Shoe Parts %	Identified Shoes # of Parts	Identified Shoes %	MNV #	Other #	Other %
31	702SH	43	(0.9)	17	(39.5)	7	(16.3)	--		5	(11.6)	6	(13.9)	1	8	(18.6)
32	703SH	101	(2.0)	45	(44.6)	22	(21.8)	9	(8.9)	10	(9.9)	5	(5.0)	1	10	(9.9)
33	704SH	3	(0.1)	--		--		--		3	(100.0)	--			--	
33	705SH	39	(0.8)	8	(20.5)	7	(18.0)	10	(25.6)	9	(23.1)	--			5	(12.8)
possible secondary ballast																
34	706SH	145	(2.9)	47	(32.4)	24	(16.5)	12	(8.3)	19	(13.1)	35	(24.1)	4	8	(5.5)
35	707SH	95	(1.9)	14	(14.8)	18	(18.9)	6	(6.3)	35	(36.8)	19	(20.0)	3	3	(3.2)
33	708SH	8	(0.2)	2	(25.0)	3	(37.5)	2	(25.0)	--		--			1	(12.5)
possible ballast																

Leather: Appendix

Leather from several catalogue numbers was not tabulated and an unknown number of loci were not completely classified. Spot checks of ARDVARC forms showed missing entries for such items as a button face, two boot flaps and a heel assemblage. Mistakes in coding of shoe parts and missing details were also located on the tabulation forms, but re-checking the artifacts and entering new data was not feasible. Bags of dry leather containing untabulated material were found when the Fulton Street Laboratory was closed. However, the drawings, ARDVARC forms, computer files, and conserved leather will be available for future research. A list of untabulated and partially tabulated catalogue numbers containing leather follows. Astericks indicate that drawings of this leather exist.

Untabulated leather

Cat. #	Feature/Non-Feature	Cat. #	Feature/Non-Feature
*275	F. 32.2	5219	NF
244	F. 32.2	5226	NF
454	F. 34.2	5297	NF
516	F. 34.4	5302	NF

Cat. #	Feature/Non-Feature
*8043	F42
*8141	F51
8138	NF
*8182	NF

Partially Tabulated Leather (e.g., dry leather was not tabulated) by Cat.

333	5229	8080
455	5108	8081
	5219	8155
		8159
		8170
		8182

In addition, Feature 42, a privy in Lot 22, was incompletely tabulated. In level 9 of this feature, 75% of the leather was classified as scrap. Heel and outer heel fragments constituted 14.3% and totaled three pieces. Leather was also identified in Level 2, Cat. #8043, but was not tabulated. A round-tipped assemblage of outsole, insole, and inner heel sections were drawn. Also recorded were two strap fragments, a counter reinforcement, a quarter fragment with fine stitching on its upper edge, and an insole which appeared to have stitching around its perimeter and evidence of a welted heel. A total of nine shoe parts from 42.2 and a small number from 42.9 separate feature and landfill levels. The percentage of untabulated catalogue numbers containing leather is 5.5%, that of known error by catalogue number only is 11.5%.

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PIPE STEM ANALYSIS
(Joan H. Geismar)

All pipe stem and bowl fragments from the 175 Water Street site were tabulated for the computer by Barbara Stidworthy and Patricia Seabury. In addition, in preparation for a regression analysis, Barbara Stidworthy measured the pipe stem bore sizes on material recovered from all occupation features and two deeptests, 29/30.1 (F55) and 29/30.02 (F56).

Regression analysis of pipe stem bore sizes has suggested mean dates of deposition for archaeological deposits predating 1780 (Binford 1961 in Schuyler 1978:66-67). However, in addition to the date of the deposit, many factors influence the reliability of the mean date for such an analysis. Among these are the size, the randomness, and the stability of the sample.

Unfortunately, the only pre-1780 pipe stem data from the analyzed deposits from 175 Water Street did not come from occupation features, but from deeptest fill; consequently, although chronologically appropriate, the randomness and stability of the sample are undetermined. In addition, a sample size (84 fragments from two deposits) further renders the analysis inconclusive. With these limitations in mind, the data and results from a basic regression analysis on the pipe stem bore sizes from this deeptest fill are presented here (see Pipe Stem Table 4.86).

Pipe Stem Table 4.86 175 WATER STREET: Analysis for Bore Size, Deeptests 29/30.01/02

Deeptest	Bore-Sizes	# and % Tabulated	Date Range
29/30.01* (F55)	4/64 in.	9 (24.3)	1750-1800
	5/65 in.	26 (70.3)	1710-1750
	6/64 in.	2 (5.4)	1680-1710
	Total	37 (100.0)	1680-1800
29/30.02	4/64 in.	10 (21.3)	1750-1800
	5/64 in.	33 (70.2)	1710-1750
	6/64	4 (8.5)	1680-1710
	Total	47 (100.0)	1680-1710

* Since the first level of this deeptest (39/30.01.003) appears to postdate 1780 (see Table 5.1), pipe stem fragments from this level are not included in the sample.

Based on Binford's regression formula, where y=1938.85-38.26x, with y=the mean deposit date, and x=the average pipe stem bore diameter, the mean deposit date for 29/30.01 is 1747.82 (1748) and for 29/30.02 is 1745.52 (1746) (see Pipe Stem Table 4.87). This information corroborates the relative dating for these deposits based on glass and ceramics analyses which also suggests that the fill matrix in Feature 55 is somewhat later than that found in Feature 56 (see feature dating, Glass and Ceramic Table 4.17).

Pipe Stem Table 4.87 175 WATER STREET: Regression Formula

Deeptest	Mean Bore Size		Sample Mean Date
29/30.01	x=4.81	. .	1931.85-38.26(4.81)=1931.85-184.03=1747.82 (1748)
29/30.02	x=4.87	. .	1931.85-38.26(4.87)=1931.85-186.32=1745.54 (1746)

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Artifact Appendix A 175 WATER STREET: Feature Strata by Cataloque Number

Feat. #	Catalogue Numbers	Feature Description
1.1)	5039 , 023, 5038 5043, 5053, 5062, 5074 5060, 5072 5065, 5070, 5076	rectangular cistern (36.01)
1.2)	5082	
1.9)	5090, 5091 5125	
2.1)	204, 208, 214, 275, 280 227, 277 229, 284 234, 246, 288 240, 245, 290 247, 253, 292 252, 293 256, 262, 295	privy (in two excavation units) (33.05/.07)
2.2)	260, 299, 309, 296, 298, 310 306, 305 312, 314 318, 328, 317, 329 334, 344, 335, 343 341, 342 349, 506 513, 350	
2.9)	562 571	
3.1)	294, 301, 304, 338, 347, 470 346 473	wooden cistern (33.01)
3.2)	504, 542, 564	
3.9)	581	
4.1)	638, 639	stone cistern (33.09)
4.2)	656	
4.3)	657	
5.1)	015, 068 087, 118 113, 176, 119, 122, 123, 181, 187, 188, 622, 646	builders' trench (33.02)
6.1)	111, 166, 174	builders' trench (33.05)

Artifact Appendix A (continued)

Feat. #	Catalogue Numbers	Feature Description
7.1)	669	collapsed barrel in alley (33.06)
8.1)	589	wooden floor in alley (33.06)
9.1)	634, 642, 658	soil below 8.1 (33.06)
10.1)	677	brick platform (33.06)
11.1)	104	wooden floor (33.05)
12.1)	364	wooden floor (33.05)
13.1)	370	metal associated w/ 12.1 (33.05)
14.1)	512, 557	builders' trench, S. wall (33.05)
15.1)	285, 321	builders' trench (33.01)
16.1)	286, 289, 291	brick floor (33.01)
17.1)	464, 469, 523, 612	"L" shaped wall segment (33.01)
18.1)	032, 103, 109, 619	"L" shaped wall segment (33.02)
19.1)	059, 110, 192, 201, 205, 211, 216	brick platform (33.03)
20.1)	070, 228, 224, 232, 259, 254	brick "flower box" (33.03)
21.1)	177	"flower box" builders' trench (33.03)
22.1)	600	builders' trench, N.E. corner (33.03)
23.1)	303, 332, 339	stone stoop (33.04)
24.1)	311, 457	builders' trench (33.04)

Artifact Appendix A (continued)

Feat. #	Catalogue Numbers	Feature Description
25.1)	359, 458, 488, 527, 540, 573	builders' trench for E. wall (33.04)
26.1)	466, 498, 501	"L" shaped wall segment (33.04)
27.1)	509, 538, 620, 120, 248, 132, 257, 653, 597, 518	grey soil, "living surface" (33.01,33.02, 33.03x3, 33.04)
28.1)	514, 522, 534, 626, 601, 654, 528, 673	orange soil, "living surface" (33.01, 33.02, 33.03. 33.04. 33.09)
29.1)	668	builders' trench, S. wall cistern (33.09)
30.1) 30.2) 30.3) 30.9)	155, 157, 169, 369, 374, 388, 400, 406,391 410, 413 417 424	box (32.02)
31.1) 31.2)	8238, 8239, 8244 8245	barrel (30.01)
32.1) 32.2) 32.3) 32.4)	168, 268, 185, 269, 324, 191, 202, 209, 210, 213, 270, 273, 281, 326, 206 217, 221, 331, 218, 223, 226, 231, 237, 333, 244, 358, 250, 266, 330, 345 352 357	stone privy (23.05)
33.1)	635, 650, 647, 651	unid. stone feature (23.05)
34.1) 34.2) 34.3) 34.4) 34.5)	409, 395, 439, 531, 422, 499, 403, 399, 414, 416, 421 428, 436, 431, 441, 447, 472, 454, 476, 529, 490, 495, 553, 502, 536, 516, 568, 608 554 563	pit (23.04)
35.1) 35.2)	440, 448, 530, 569 532	large box (S.E. box) (23.04)
36.1) 36.2)	609, 667 624	small box (S.W. box) (23.04 & 23.02)

Artifact Appendix A (continued)

Feat. #	Catalogue Numbers	Feature Description
37.1)	636	barrel (23.03)
38.1)	180, 196, 189, 197, 190, 198, 236 (note: 198 appears to be missing)	cistern base (23.04)
38.2)	242, 385, 390	
39.1)	203, 276, 279, 233, 238	E. wall trench (23.04)
40.1)	255, 261, 267, 263, 272	unid. stone feature (23.04)
40.2)	274, 327	
40.3)	297, 319	
40.9)	320	
41.1)	5127, 5131, 5256, 5169, 5137, 5170, 5275, 5143, 5160, 5177, 5276, 5184, 5220, 5268, 5227, 5228, 5290, 5266, 5262, 5265	large rectangular privy (22.02)
41.2)	5187, 5283, 5195, 5233, 5236, 5269	
41.9)	5239, 5291, 5249	
42.1)	8023, 8027, 8030	small squarish privy (21.01)
42.2)	8031, 8034, 8038, 8043, 8045, 8048	
42.9)	8068, 8096, 8168	
43.1)	8015, 8018, 8098, 8119,	large rectangular privy (21.01)
43.2)	8100, 8111, 8113, 8118, 8137	
43.3)	8136, 8139, 8140, 8151	
43.9)	8170	
44.1)	8076, 8195, 8197, 8207, 8212	round privy (21.02)
44.9)	8215	
45.1)	8055, 8194, 8253	drain in round privy, F44.2 (21.02)
46.1)	8122, 8132, 8123, 8128	drain in large privy, F43.1 (21.01)
47.1)	5257	rectangular privy (20.05)
47.2)	5277, 5288, 5278, 5287, 5298, 5294	
47.3)	5302	

Artifact Appendix A (continued)

Feat. #	Catalogue Numbers	Feature Description
48.1) 48.2) 48.9)	5311, 5320, 5331, 5316, 5317 5319, 5326, 5336, 5332, 5347, 5350, 5338, 5348 5353, 5355, 5360,	rectangular privy (20.02)
49.1) 49.2) 49.3) 49.9)	5270, 5318, 5321, 5323, 5327, 5333, 5340, 5345, 5346 5351 5352	box/cofferdam (20.05 & 20.06)
50.1) 50.9)	5078, 5130, 5079, 5181, 5097, 5182, 5099, 5138, 5135, 5140, 5192, 5212, 5189, 5205, 5203, 5211 5285, 5305, 5309	rectangular privy (19.03)
51.1) 51.2) 51.9)	8041, 8074, 8044, 8047, 8049, 8090, 8070, 8092, 8091 8057, 8099, 8059, 8153, 8174 8169	rectangular privy (18.02)
52.1) 52.2) 52.9)	8205, 8208, 8209, 8210 8211 8214	wooden box (18.01)
53.1) 53.2)	8218, 8219, 8220, 8222, 8226, 8227 8228	interior, unid. stone feature (18.01)
54.1) 54.2)	8230, 8231, 8234, 8241 8242	cistern base (18.04)
55.1) 55.2) 55.3) 55.4)	8078, 8079, 8080, 8081, 8082 8083, 8084, 8085, 8086 8087 8088, 8101, 8102, 8103, 8114	deeptest 29/30.01 (93.01.002 for computer tabs)
56.1) 56.2) 56.3) 56.4)	8143, 8144, 8145, 8146, 8147 8148, 8154, 8155, 8156 8157 8158, 8159, 8160	deeptest 29/30.02*(93.02.002 for computer tabs)
57.1 57.9	507, 535, 517, 584 627	barrel outside privy (Feat. 2), (33.05)

NOTE: Feature levels designated as 9 indicate possible original landfill.

*Note: Because of instability of trench walls, no profiles were drawn of deeptest 29/30.02 (93.02.002); therefore, levels are based solely on written descriptions.

ARTIFACT APPENDIX B 175 WATER STREET: Feature Soil Color by Lot, Locus, and Catalogue Numbers* (The following data are based on the Munsell Soil Color Charts, 1975.)

Lot 18

Locus #/	Cat #	Color (dry) Hue	Value	Chroma
18.02.010/	8090	10 YR	5/2	grayish brown
18.02.014/	8091	10 YR	6/2	pinkish gray

Lot 19

19.03.018.1/5203		2.5Y	5/2	greyish brown
19.03.017.1/5205		10YR	5/2	greyish brown
19.03.019.1/5211		2.5Y	5/2	greyish brown
19.03.006.2/5182		2.5Y	5/2	greyish brown
19.03.021.1/5222A		10YR	5/2	greyish brown
19.03.006.1/5097		2-5YR	5/2	greyish brown
19.03.003.1/5129		10YR	6/2	light brownish grey
19.03.005.1/5130		2.5Y	5/2	greyish brown
19.03.021.1/ 19.03.027.1/5099		10YR	5/2	greyish brown
19.03.017.1/		10YR	5/2	greyish brown
19.03.005.1/5078		10YR	5/2	greyish brown
19.03.005.2/5079		2.5Y	5/2	greyish brown
10.03.005.2/5181		2.5Y	4/2	dark greyish brown
19.03.016.1/5180		10YR	5/2	greyish brown
19.03.010.1/5140		2.5Y	5/2	greyish brown
19.03.007.1/5138		2.5Y	4/2	dark greyish brown
21.01.008.1/8068		2.5Y	5/2	greyish brown
19.03.010.2/5192		10YR	5/2	greyish brown
19.03.010.3/5212		10YR	5/2	greyish brown
19.03.009.1/5135		10YR	5/2	greyish brown
19.03.003.1/5071		10YR	5/3	brown
19.03.027.1/5099		2.5Y	4/2	dark greyish brown
19.03.029.2/5305		10YR	4/2	dark greyish brown
19.03.030/	5309	2.5Y	4/2	dark greyish brown
19.03.028.1/5285		2.5Y	4/2	dark greyish brown

Artifact Appendix B (continued)

Locus #/	Cat #	Color (dry) Hue	Value	Chroma
Lot 20				
20.05.005.1/	5277	2-5Y	5/2	greyish brown
20.05.007.1/	5508	2-5Y	5/2	greyish brown
20.02.003.3/	5331	10Y	4/2	dark greyish brown
20.02.010.3/	5350	2-5Y	4/2	dark greyish brown
20.02.007.2/	5320	10YR	4/2	dark greyish brown
20.02.010.2/	5347	2-5Y	4/2	dark greyish brown
20.05.007.1/	6294	2-5Y	4/2	dark greyish brown
20.02.008.1/	5316	10YR	5/2	dark greyish brown
20.05.006.1/	5287	10YR	4/2	dark greyish brown
20.02.011.1/	5338	10YR	5/2	light brownish grey
20.05.005.2/	5278	10YR	6/2	brownish grey
20.06.002.1/	5318	10YR	5/2	greyish brown
20.05.005.1/	5288	10YR	5/2	greyish brown
20.06.004.1/	5327	10YR	5/2	greyish brown
20.06.004.2/	5333	10YR	5/2	greyish brown
20.05.003.1/	5257	2-5Y	5/2	greyish brown
20.02.008.2/	5317	10YR	5/2	greyish brown
20.06.007.1/	5340	2-5Y	4/2	dark greyish brown
20.02.007.1/	5311	10YR	5/2	dark greyish brown
20.02.010.1/	5332	2-5Y	4/2	dark greyish brown
20.05.006.1/	5298	2-5Y	4/2	dark greyish brown
20.06.003.1/	5323	10YR	5/2	greyish brown
20.06.004.2/	5333	2-5Y	4/2	dark greyish brown
20.06.002.2/	5321	2-5Y	4.5/2	dark greyish brown
20.06.005.1/	5340	2-5Y	5/2	greyish brown (mortar)
20.06.008.1/	5351	2-5Y	4/2	dark greyish brown
20.02.012.2/	5348	2-5Y	4/2	dark greyish brown
20.02.009.2/	5326	10YR	4/2	dark greyish brown
20.02.009.1/	5319	10YR	5/3	brown
20.05.008.1/	5302	10YR	4/6	dark yellowish brwn
20.02.013.1/	5353	2-5Y	4/4	olive brown
20.02.009.3/	5336	7.5YR	4/2	brown-dark brown
20.02.013.2/	5355	7.5YR	4/2	brown-dark brown
20.02.014.1/	5360	10YR	5/3	brown
20.05.004.1/	5270	10YR	4/2	brown-dark brown

Artifact Appendix B (continued)

Locus #/	Cat #	Color (dry) Hue	Value	Chroma
Lot 21				
21.02.012.1/	8197	10YR	6/2	light brownish grey
21.03.008.1/	8189	10YR	5/2	greyish brown
21.01.010.1/	8111	2.5Y	5/2	greyish brown
21.01.014.1/	8123	2.5Y	4/2	dark greyish brown
21.01.005.1/	8031	10YR	5/2	dark greyish brown (mortar)
21.01.002.2/		10YR	5/2	greyish brown
21.01.012.1/	8133	10YR	3/1	very dark grey
21.02.010.1/	8192	10YR	5/2	greyish brown
21.01.005.5/	8045	10YR	4/2	dark greyish brown
21.01.013.1/	8119	2.5Y	4/2	dark greyish brown
21.04.004.1/	8017	10YR	5/2	greyish brown
21.01.003.3/	8030	10YR	6/2	light browish grey
21.01.005.3/	8038	10YR	5/2	greyish brown
21.04.006.1/	8022	2.5Y	5/2	greyish brown
21.02.014.1/	8207	2.5Y	5/2	greyish brown (shell)
21.02.009.2/	8195	10YR	6/3	pale brown
21.01.003.1/	8023	10YR	5/2	greyish brown
21.01.022.1/	8170	5Y	3/1	very dark grey
21.01.019.1/	8140	2.5Y	5/2	greyish brown
21.03.006.1/	8187	10YR	5/2	greyish brown
21.01.003.2/	8027	10YR	5/2	greyish brown
21.01.009.2/	8122	10YR	5/2	greyish brown
21.01.009.1/	8104	2.5Y	5/2	greyish brown
21.01.005.2/		2.5Y	4/2	dark greyish brown
21.01.005.7/	8061	2.5Y	4/2	dark greyish brown
21.01.012.1/	8118	10YR	3/2	very dark brown
21.02.015.1/	8212	10YR	4/3	dark brown
21.02.011.1/	8194	10YR	5/2	greyish brown
21.01.008.3/	8168	10YR	5/1	
21.01.016.1/	8128	2.5Y	4/2	dark greyish brown
21.03.009.1/	8140	10YR	5/2	greyish brown
21.01.011.1/	8113	10YR	3/2	very dark greyish brown (mottled)
21.01.018.1/	8139	10YR	5/1	grey
21.02.009.1/	8076	10YR	5/3	
21.01.009.3/	8132	10YR	4/1.5	dark grey brown
21.01.005.4/	8043	10YR	4/2	greyish brown
21.02.016.1/	8215	10YR	4/3	brown (rust?)
21.01.005.6/	8048	2.5Y	4/2	dark greyish brown
21.02.004.1/	8055	2.5Y	5/2	greyish brown
21.01.017.1/	8136	2.5Y	4/2	dark greyish brown
21.01.021.1/	8151	2.5Y	5/2	greyish brown
21.02.001.2/	8052	5YR	4/1	dark grey
21.02.001.1/	8046	10YR	4/2	dark greyish brown
21.01.002.7/	8100	2.5Y	4/2	dark greyish brown

Artifact Appendix B (continued)

Locus #/	Cat #	Color (dry) Hue	Value	Chroma
Lot 22				
22.02.013.1/	5239	2.5Y	4/2	dark greyish brown
22.02.014.1/	5249	2.5Y	4/0	dark grey
Lot 23				
23.04.056.1/	563	2.5Y	4/2	dark greyish brown
23.04.054.1/	553	7.5YR	6/2	pinkish grey
23.04.006.1/	236	7.5YR	6/2	pinkish grey
23.05.001.1/	288	10YR	5/2	greyish brown
23.04.001.1/	180	10YR	6/2	light brownish grey
23.05.010.1/	244	10YR	4/1	dark grey
23.05.001.1/	168	10YR	6/2	light brownish grey
23.04.008.1/	385	10YR	6/2	light brownish grey
23.05.016.1/	647	10YR	5/1	grey
23.05.009.1/	237	2.5Y	5/2	greyish brown
23.04.001.1/	624	2.5Y	4/2	dark greyish brown
23.04.053.1/	532	10YR	3.5/1	dark grey
23.05.004.1/	206	10YR	6/3	pale brown
23.05.005.2/	331	10YR	4/2	dark greyish brown
23.04.020.1/	367	10YR	6/2	light brownish grey
23.01.002.1/	5022	10YR	4/2	dark greyish brown (mortar)
23.05.005.2/	221	2.5Y	5/2	greyish brown (mortar)
23.05.013.1/	352	2.5Y	5/2	greyish brown (mortar)
23.05.007.1/	223	10YR	5/2	greyish brown
23.04.012.1/	263	10YR	5/3	brown
23.04.013.1/	272	10YR	5/2	greyish brown
23.04.007.1/	242	10YR	6/2	light brownish grey
23.04.033.1/	421	2.5Y	4/2	dark greyish brown
23.04.037.1/	433	10YR	5/2	greyish brown (mortar)
23.05.002.1/	269	10YR	5/2	greyish brown
23.04.027.2/	392	10YR	5/2	greyish brown
23.04.059.1/	609	10YR	4/2	dark greyish brown
23.04.005.3/	238	10YR	5/2	greyish brown

Artifact Appendix B (continued)

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
Lot 23 (continued)			
23.04.027.1/ 390	10YR	5/2	greyish brown
23.05.008.1/ 226	10YR	5/2	greyish brown
23.05.006.1/ 218	2.5Y	5/2	greyish brown
23.05.011.1/ 250	2.5Y	5/2	greyish brown
23.05.015.2/ 050	10YR	6/2	dark brownish grey
23.04.017.1/ 320	10YR	6/3	pale brown
23.04.002.1/ 189	10YR	6/2	light brownish grey
23.03.002.1/ 036	10YR	5/2	greyish brown (mottled, darker)
23.05.015.1/ 635	10YR	7/2	light grey
23.05.009.1/ 333	2.5Y	5/2	greyish brown
23.05.003.1/ 270	10YR	6/2	light brownish grey
23.05.002.1/ 185	10YR	5/2	greyish brown
23.05.003.1/ 191	10YR	6/2	light brownish grey
23.05.003.4/ 210	2.5Y	5/2	greyish brown
23.04.052.1/ 530	2.5Y	4/2	dark greyish brown
23.04.005.2/233	10YR	5/2	greyish brown
23.04.016.1/ 319	10YR	5/2	greyish brown
23.04.039.1/ 440	10YR	4/1.5	dark greyish brown/ grey
23.05.014.1/ 357	10YR	5/2	greyish brown
Lot 29/30			
29/30.01.002.6/8083	10YR	4/1	dark grey
29/30.02.002.11/8158	10YR	6/2	light brownish grey or
	5YR	5/4	reddish brown
29/30.01.002.13/8102	10YR	6/2	light brownish grey
29/30.02.002.6/8148	10YR	5/3	brown
29/30.01.00207/8084	2.5Y	3/2	very dark greyish brown
29/30.02.002.1/8143	10YR	5/4	yellowish brown
29/30.01.002.4/8081	2.5Y	4/2	dark greyish brown
29/30.02.002/ 8160	2.5Y	4/2	dark greyish brown
29/30.02.002.7/8154	10YR	4/3	brown - dark brown
29/30.02.002.8/8155	10YR	5/3	brown
29/30.02.002.9/8156	10YR	4/3	brown - dark brown
29/30.01.002/8080	2.5Y	4/2	dark greyish brown
29/30.02.002.10/8157	2.5Y	5/2	greyish brown
29/30.02.002.2/8144	10YR	4/2	dark greyish brown
29/30.01.002.12/8101	2.5Y	5/2	greyish brown

Artifact Appendix B (continued)

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
Lot 29/30 (continued)			
29/30.01.002.15/8114	10YR	4/1	dark grey
29/30.01.002.1/8978	10YR	6/2	light brownish grey
29/30.01.002.9/8086	2Y	5/2	greyish brown
29/30.02.002.5/8147	10YR	4/2	dark greyish brown
29/30.01.002.8/8085	10YR	3/1	very dark grey
29/30.01.002.10/8087	2.5Y	5/2	greyish brown
29/30.01.002.11/8088	10YR	5/2	greyish brown
29/30.02.002.12/8159	2.5Y	5/2	greyish brown
29/30.02.002.3/8145	10YR	3/2	very dark greyish brown
29/30.01.002.14/8103	10YR	4/2	dark greyish brown
29/30.01.002.4/8081	2.5Y	5/2	greyish brown
29/30.02.007.4/8146	7.5YR	4/2	brown - dark brown
29/30.01.002.5/8082	10YR	4/2	dark greyish brown
29/30.02.002.10/8157	5Y	5/1	grey
29/30.02.002.11/8158	5Y	6/1	light grey
29/30.02.002.0/8160	5Y	5/2	olive grey
29/30.01.002.1/	10YR	7/2	light grey (mortar)
29/30.02.002.8/8155	10YR	4/1	dark grey (w/rust)
29/30.01.002.14/	2.5Y	6/2	light brownish grey
29/30.02.007.4/8146	10YR	5/2	greyish brown
29/30.02.002.12/8159	2.5Y	5/2	greyish brown
29/30.02.002.3/8145	2.5Y	4/2	dark greyish brown
29/30.01.002.5/8082	5Y	4/1	dark grey
29/30.02.002.6/8148	10YR	5/3	brown
29/30.02.002.9/8156	2.5Y	4/2	dark greyish brown (mottled)
29/30.02.002.7/8154	10YR	5/2	greyish brown
29/30.01.002.9/8086	5Y	4/1	dark grey
29/30.01.002.15/8114	5Y	5/1	grey
29/30.01.002.11/8088	10YR	5/1	grey
29/30.01.002.13/8102	2.5Y	6/2	light brownish grey
29/30.01.002.12/8101	2.5Y	6/2	light brownish grey
29/30.01.002.7/8084	5Y	4/1	dark grey
29/30.01.002.3/8080 (southside)	2.5Y	5/2	greyish brown
29/30.01.002.0/8083	5Y	4/1	dark grey
29/30.01.002.4/8081	2.5Y	5/2	greyish brown
29/30.02.002.1/	10YR	5/3 (redder)	brown

Artifact Appendix B (continued)

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
29/30.01.002/8087	2.5Y	5/2	greyish brown
29/30.02.002.5/8147	10YR	5/2	greyish brown
29/30.02.002.2/	2.5Y	5/2	dark greyish brown
29/30.01.002.8/8085	10YR	4/1	grey
29/30.02.002.10/8157	5Y	5/1	grey
29/30.02.002.11/8158	5Y	6/1	light grey
29/30.02.002.0/8160	5Y	5/2	olive grey
29/30.01.002.1/	10YR	7/2	light grey (mortar)
29/30.02.002.8/8155	10YR	4/1	dark grey (w/rust)
29/30.01.002.1/	2.5Y	6/2	light brownish grey
29/30.02.007.4/8146	10YR	5/2	greyish brown
29/30.02.002.12/8159	2.5Y	5/2	greyish brown
29/30.02.002.3/8145	2.5Y	4/2	dark greyish brown
29/30.01.002.5/8082	5Y	4/1	dark grey
29/30.02.002.6/8148	10YR	5/3	brown
29/30.02.002.9/8156	2.5Y	4/2	dark greyish brown (mottled)
29/30.02.002.7/8154	10YR	5/2	greyish brown
29/30.01.002.9/8086	5Y	4/1	dark grey
29/30.01.002.15/8114	5Y	5/1	grey
29/30.01.002.11/8088	10YR	5/1	grey
29/30.01.002.13/8102	2.5Y	6/2	light brownish grey
29/30.01.002.12/8101	2.5Y	6/2	light brownish grey
29/30.01.002.7/8084	5Y	4/1	dark grey
29/30.01.002.3/8080 (southside)	2.5Y	5/2	greyish brown
29/30.01.002.6/8083	5Y	4/1	dark grey
29/30.01.002.4/8081	2.5Y	5/2	greyish brown
29/30.02.002.1/	10YR	5/3	(redder) brown
29/30.01.002./8087	2.5Y	5/2	greyish brown
29/30.02.002.5/8147	10YR	5/2	greyish brown
29/30.02.002.2/	2.5Y	5/2	dark greyish brown
29/30.01.002.8/8085	10YR	4/1	dark grey
Lot 22			
22.02.002.1/5275	2.5Y	4/2	dark greyish brown
22.02.007.1/5283	10YR	5/2	dark greyish brown
22.02.006.1/5184	10YR	3/1	very dark grey
22.02.003.1/5143	10YR	3/2	very dark greyish brown
22.02.016.1/5293A	2.5Y	5/2	grayish brown
22.02.006/5268 (mortar inclusion)	10YR	7/2	light grey

Artifact Appendix B (continued)

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
22.04.005.1/5342	10YR	5/2	greyish brown
22.02.007.1/5187	10YR	4/1	dark grey
22.02.006.2/5220	10YR	3/1	very dark grey (mortar)
22.02.012.1/5236	2.5Y	4/2	dark greyish brown
22.04.004.3/5341	10YR	5/2	greyish brown
22.02.002.1/5205	10YR	4/2	dark greyish brown
22.02.015.1/5262	10YR	4/2	dark greyish brown
22.02.016.1/5293	2.5Y	5/2	greyish brown
22.02.012.1/5127	2.5Y	4/2	dark greyish brown
22.02.002.1/5131	10YR	5/2	greyish brown
22.02.002.2/5170	10YR	3.5/2	very dark greyish brown
22.02.004.1/5160	2.5Y	4/2	greyish brown
22.02.002.2/5137	10YR	3/2	very dark greyish brown
22.02.002.2/5137A	10YR	7/2	light grey
22.02.010.1/5290	10YR	5/2	greyish brown
22.02.006.1/5268	10YR	3/2	dark greyish brown (mortar)
22.02.005.1/5276	2.5Y	4/2	dark greyish brown
22.02.010.1/5228	2.5Y	7/2	light grey
Lot 30			
30.01.012.1/8238	10YR	4/1	dark grey
30.02.009.1/8166	10YR	3/1	very dark grey
Lot 32			
32.02.030.1/417	2.5Y	5/2	greyish brown
32.02.015.6/406	10YR	4.5/2	greyish brown
32.02.015.5/400A	10YR	5/2	greyish brown
32.02.015.1/142	7.5YR	5/2	brown
32.02.027.1/396	10YR	4/2	dark greyish brown
32.02.026.1/393	10YR	5/2	greyish brown
32.02.028.1/410	10YR	4/2	dark greyish brown
32.02.015.4/388	10YR	5/2	greyish brown
	10YR	3/2	very dark greyish brown
32.02.015.5/400	10YR	4/2	dark greyish brown
32.02.029.1/413	10YR	3/1	very dark grey

Artifact Appendix B (continued)

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
Lot 32 (continued)			
32.02.031.1/424	10YR	5/2	greyish brown
32.02.015.3/374	10YR	5/3	brown
32.02.015.5/400	10YR	4/2	dark greyish brown
32.02.015.2/369	10YR	5/2	greyish brown
32.02.015.1/243	10YR	5/2	greyish brown
32.02.025.1/391	7.5YR	5/2	brown
32.02.024.1/384	10YR	5/2.5	greyish brown
Lot 33			
33.03.017.1/205	10YR	5/3	brown
33.05.033.3/420	2.5Y	5/2	greyish brown
33.05.064.1/571	10YR	5/4	yellowish brown
33.05.067./584	2.5Y	4/4	dark greyish brown
33.05.049.2/505	10YR	5/3	brown
33.05.013.1/229	10YR	5/2	greyish brown
33.05.033.5/461	2.5Y	5/2	greyish brown
33.05.050.1/497	10YR	5/2	greyish brown
33.05.063.1/566	2.5Y	4/2	dark greyish brown
33.05.034.1/407	10YR	5/2	greyish brown
33.09.007.1/657	2.5Y	4/2	dark greyish brown
33.09.002.5/595	10YR	5/2	greyish brown
33.05.032.2/397	2.5Y	4/2	dark greyish brown
33.05.023.1/334	2.5Y	5/2	greyish brown
33.09.002.6/638	10YR	4.5/2	dark greyish brown
33.05.022.1/318	2.5Y	4.5/2	dark greyish brown
33.09.002.4/560	2.5Y	4/2	dark greyish brown
33.05.019.3/309	10YR	5/3	brown
33.03.006.2/110	10YR	5/4	yellowish brown
33.05.018.1/256	10YR	5/4	yellowish brown
33.05.014.1/234	10YR	4/2	dark greyish brown
33.06.011.1/676	10YR	4/2	dark greyish brown
33.07.018.1/317	2.5Y	5/2	greyish brown
33.05.002.1/562	2.5Y	4/2	dark greyish brown
33.05.054.1/513A	10YR	5/2	greyish brown
33.05.022.2/328	2.5Y	5/2	greyish brown
33.07.018.2/329	2.5Y	5/2	greyish brown
33.05.015.1/240	2.5Y	6/2	light brownish grey
33.09.002.7/639	10YR	5/2	greyish brown
33.05.019.1/260	2.5Y	5/2	greyish brown
33.06.008.1/689	10YR	5/4	yellowish brown
33.05.020.1/306	10YR	5/4	yellowish brown

Artifact Appendix B (continued)

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
Lot 33 (continued)			
33.06.004.1/634	10YR	5/2	greyish brown
33.06.002.1/589	10YR	3/2	very dark greyish brown (rust)
33.05.054.1/513	2.5Y	4/2	dark greyish brown
33.05.052.1/507	10YR	5/4	yellowish brown
33.05.008.1/627	2.5Y	4/2	dark greyish brown
33.09.009.1/668	10YR	5/2	greyish brown
33.01.009.1/308	10YR	5/3	brown
33.01.029.1/592	10YR	5/2	greyish brown
33.01.014.1/473	10YR	5/3	brown
33.01.015.1/492	10YR	5/3	brown
33.01.027.1/581	2.5Y	5/2	greyish brown
33.01.015.2/564	10YR	5/2	greyish brown
33.05.007.3/174	10YR	5/2	greyish brown
33.07.004.1/147	2.5Y	5/2	greyish brown
33.05.015.2/245	10YR	4/2	dark greyish brown (mortar)
33.05.012.1/227	2.5Y	5/2	greyish brown
33.09.002.1/596	2.5Y	4/2	dk. greyish brown
33.09.002.4/560A	2.5Y	5/2	greyish brown (mortar)
33.05.011.1/204	10YR	6/2	light brownish grey
33.09.004.1/588	10YR	6/2	light brownish grey (mortar)
33.05.033.5/438	2.5Y	5/2	greyish brown
33.05.009.1/183	10YR	6/2	light brownish grey
33.05.049.3/585	2.5Y	5/2	greyish brown
33.05.025.2/506	2.5Y	4/2	dark greyish brown *didn't match/grey
33.02.002.2/68	10YR	4/2	dark greyish brown
33.02.011.6/646	2.5Y	5/2	greyish brown
33.02.018.1/629	10YR	5/2	greyish brown
33.02.011.5/622	2.5Y	5/2	greyish brown
33.02.018.2/643	10YR	6/3	pale brown
33.02.002.1/15	2.5Y	4/2	dark greyish brown
33.05.018.1/256A	2.5Y	6/2	light brownish grey
33.07.017.1/314	2.5Y	5/2	greyish brown
33.05.029.1/378	2.5Y	5/2	greyish brown
33.05.007.1/111	10YR	5/2	greyish brown
33.02.011.1/113	10YR	5/2	greyish brown
33.01.008.2/301	10YR	5/3	brown
33.05.019.2/299	2.5Y	5/2	greyish brown
33.05.028.1/373	2.5Y	4/2	dark greyish brown
33.05.031.1/381	10YR	6/2	light brownish grey

Artifact Appendix B (continued)

Lot 33 continued

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
33.01.008.4/338	10YR	5/3	brown
33.01.016.1/508	10YR	6/4.5	light yel. brown
33.01.002.1/212	2.5Y	4/2	dk. greyish brown
33.01.020.1/515	10YR	5/3	brown
33.01.015.2/542	10YR	5/3	brown
33.01.015.1/504	10YR	5/4	yellowish brown
33.03.023.1/597	2.5Y	5/2	greyish brown
33.03.025.1/601	10YR	5/2	greyish brown
33.03.008.3/228	2.5Y	5/2	greyish brown
33.03.017.1/205	10YR	5/3	brown
33.05.009.3/225	10YR	5/2	greyish brown
33.05.032.2/397	2.5Y	4/2	dark greyish brown
33.05.068.1/027	2.5Y	4/2	dark greyish brown
33.03.019.1/216	10YR	5/3	brown
33.03.015.1/192	10YR	5/3	brown
33.01.010.1/316	10YR	5/4	yellowish brown
33.03.018.1/211	10YR	5/3	brown
33.05.028.1/373	10YR	4/1	dark grey
33.03.014.1/177	10YR	5/2	greyish brown
33.04.004.1/303	10YR	4/1	dark grey
33.05.053.1/512	10YR	5/2	greyish brown
33.09.010.1/673	10YR	5/3	brown
33.07.006.?/158,163	10YR	4/1	dark grey
33.03.021.1/254	10YR	6/2	light brownish grey
33.07.005.1/150	10YR	5/2	greyish brown
33.05.031.1/381	10YR	5/2	greyish brown
33.06.009.1/071	10YR	4/2	dark greyish brwn
33.03.020.2/259	10YR	5/2	greyish brown
33.06.004.2/642	10YR	5/3	brown
33.03.020.1/232	2.5Y	6/2	lt. brownish grey (mortar)
33.05.006. /384	10YR	3/4	dark yellowish brown (rust)
33.04.029. /493	2.5Y	5/2	greyish brown
33.04.030.1/494	10YR	5/3	brown
33.04.020.1/457	10YR	5/3	brown
33.04.034.1/527	10YR	5/2.5	greyish brown
33.03.009.1/120	10YR	5/2	greyish brown
33.01.006.1/289	10YR	4/2	dark greyish brwn
33.05.029.1/378	2.5Y	5/2	greyish brown

Artifact Appendix B (continued)

Lot 33 (continued)

Locus #/ Cat #	Color (dry) Hue	Value	Chroma
33.04.035.1/528	10YR	5/3	brown
33.04.021.2/488	2.5Y	5/2	*(greyer) greyish brown
33.04.033.1/518	10YR	5/2	greyish brown
33.02.018.2/643	10YR	6/3	pale brown
33.01.017.1/509	10YR	5/2	greyish brown
33.01.023.1/541	10YR	5/3	brown
33.01.027.1/581	10YR	4/1.5	dark greyish brown
33.01.022.1/539	10YR	5/2	greyish brown
33.01.014.1/534	10YR	4/4	dark yellowish brown
33.01.013.1/469	10YR	5/3	brown
33.01.012.1/464	10YR	5/2	greyish brown
33.01.018.1/537	10YR	6/2	light brownish grey
33.01.018.1/510	10YR	6/2	light brownish grey
33.01.017.1/538	10YR	6/2	light brownish grey
33.02.016.1/620	2.5Y	5/2	greyish brown
33.01.019.1/514	10YR	5/3	brown
33.01.019.1/522	10YR	5/3	brown
33.02.017.1/626	10YR	5/3	brown
33.02.005.2/32	10YR	4.5/2	dark greyish brown
33.04.036.1/580	2.5Y	5/2	greyish brown
33.04.021.1/458	2.5Y	5/2	greyish brown
33.03.024.1/600	10YR	5/2	greyish brown
33.05.048.1/474	10YR	5/2	greyish brown
33.01.034.1/612	10YR	5/2	greyish brown
33.05.049.1/496	10YR	4/3	dark brown
33.02.015.1/619	10YR	5/2	greyish brown
33.05.005.1/104A (floorboard)	10YR	3/1	very dark grey
33.03.005.1/104B (under floorboard)	10YR	4/1	dark grey
33.04.007.1/311	10YR	5/2	greyish brown
33.05.066.1/578	2.5Y	4/2	dark greyish brown
33.04.010. /332	2.5Y	4/2	dark greyish brown
33.01.021 /523	10YR	4/2	dark greyish brown
33.04.013/339	2.5Y	4/2	dark greyish brown
33.02.005.1/20	7.5YR	4/2	brown dark brown
33.05.063.1/566	10YR	4/2	dark greyish brown
33.04.032.1/501	10YR	4/2	dark greyish brown
33.04.031.1/498	10YR	4/2	dark greyish brown
33.04.026.1/466	7.5YR	4/2	brown - dark brown
33.05.007.3/174	2.5Y	4/2	dark greyish brown
33.05.007.1/111	2.5Y	4/2	dark greyish brown

* Soils from the following catalogue numbers are missing from the data: 5352, 5291, 569, 667, 553, 414, 8238, 8245, 627, 658, 224, 166, 8087, 8079.

APPENDIX B BIBLIOGRAPHY

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CHAPTER 5: LANDFILL
(Joan H. Geismar)

One goal of the 175 Water Street excavations was to understand how this block, once part of the East River, became land beginning in the mid-eighteenth century. Through archaeological investigation, many of the processes involved in the block's fill history--a history extending from approximately 1740 to 1795--can be reconstructed. It is now possible to outline at least two primary fill processes. The first, an unstructured process, is related to harbor build-up from dumping and river accretion. The second, involving careful engineering, is tied to two episodes: The building of a wharf/grillage support system on the western part of the block and the incorporation of a derelict eighteenth-century merchant vessel into cribbing to define the block's eastern limit. This ship cribbing served to hold the land in place while keeping the East River out. An integral part of the engineering process was the deliberate filling of the space between the wharf/grillage and the ship-cribbing, a space of more than sixty feet. To accomplish this, garbage was allowed or caused to accrue for decades. In addition, secondary filling, undertaken late in the eighteenth century to eliminate pockets of depressed fill, was also defined during these excavations.

The history, the traditions, the archaeological manifestations, and the interpretations of the fill techniques found on the 175 Water Street block will be discussed in this chapter. In addition, the landfill techniques found archaeologically at several relevant Manhattan and European sites will be compared briefly with those observed at 175 Water Street.

For interpretative suggestions about landfill constructions found at 175 Water Street, and for information about the historic engineering and architectural traditions of these constructions, thanks must go to Benjamin Nistal-Moret, formerly of the Historic Preservation Program, Graduate School of Architecture and Planning, Columbia University. They are also extended to the archaeologists cited in the text who generously made information, much of it unpublished, available.[1]

DOCUMENTED HISTORY OF LANDFILL RELEVANT TO THE 175 WATER STREET SITE

With their structural elements mainly, if not entirely, of wood, the fill mechanisms uncovered on the 175 Water Street block apparently have their roots in antiquity and their evolution in Europe. Beyond this, as with any tradition, local adaptations were incorporated into their design.

Although no documented history of an early American fill tradition appears to exist, a written tradition for creating and stabilizing land for subsequent construction can be traced to Europe in the first century B.C. At this time relevant techniques were recorded by Marcos Vitruvius Pollio, a Roman architect and engineer. In his Ten Books on Architecture, reputed to be the oldest and most influential architectural treatise in existence, Vitruvious deals with "harbors, breakwaters, and shipyards" (Morgan 1914:162-164) and describes methods for using piling, platforms, and wooden cofferdams to create and prepare land for further construction. In this same work, he also describes the principles and design of several engines capable

of raising water, making it possible to dewater during land reclamation. Among these dewatering devices are the tympanum, the water screw, and the pump of Ctesibius--the first two of wood, the last a bronze piston engine utilizing water and air pressure (Morgan 1914:293-298). Thus it can be seen that two principles affecting land reclamation--stabilization and dewatering--were known and used in antiquity.

In addition to any oral tradition that may have existed, fifteenth-century Europe rediscovered Vitruvius, and by the sixteenth century his work had been translated into Italian and French among other languages (Nistal 1982: personal communication). By the mid-1500s, French and Italian architects were embellishing Vitruvius' principles and, by using platforms and pilings, landfill and stabilization of foundations on created land became sufficiently sophisticated to allow the Renaissance expansion of such maritime cities as Venice in Italy and Leiden and Amsterdam in Holland.

Early in the seventeenth century, Scamozzi, the architect of Venice, described several engineering procedures relevant to landfill in lower Manhattan. In discussing bridge-building, he described a wooden grillage system of oak upon which a foundation could be partially built and the construction then sunk directly onto a leveled section of river bottom. He also described cribbing constructions of horizontal boards nailed to piling that retained soil in tidal situations; and he discoursed on how old or deformed ships found in seaport areas could be tied together, filled with ballast, and, when foundations were partially built on them, sunk to river bottom (Nistal 1982: personal communication).

Beginning in 1640, Scamozzi's work was translated into Dutch; after 1670, English translations, based on those in Dutch, became available (Nistal 1982: personal communication). Beyond this, note was made in 1675 by Nicholas Blondel, a French engineer, that a timber grillage, or raft, on which he built foundations for a construction in a French naval city, were similar to those known and used in Holland. In fact, archaeological investigation has revealed that Roman and Medieval ports in both Northern and Eastern Europe utilized fill constructions described in the Renaissance (Baart et al. 1977; see discussion below); this includes the documentation of shipwrecks used as fill in Amsterdam in the fourteenth, fifteenth, and sixteenth centuries (Baart et al. 1977:62). Therefore, although the Dutch most obviously applied these engineering principles, conceivably they were familiar to both the Dutch and English inhabitants of New York City when land reclamation began along the East River waterfront.

THE EAST RIVER AS A FOCUS OF LANDFILL

In 1665, the city of New York, which had been Dutch until its capitulation to the English late in 1664, was incorporated under English rule; at this time the city limits extended beyond its original Dutch boundary of Wall Street to encompass all of Manhattan Island. But it wasn't until 1686, when the Donogan Charter granted to the corporation all unappropriated land upon the island to low water mark, that major land filling maneuvers began (Black 1891:17; Harris 1980:6; Chapter 2, this report).

With all of the island within its boundaries, the question arises as to why in the late-seventeenth and throughout the eighteenth centuries the city's legislators and inhabitants chose to build into the East River rather than expand northward, and why the East River rather than the Hudson was chosen initially for land reclamation (Peterson 1917:88).

Undoubtedly economics, resources, and defenses were deciding factors. Certainly, New York's powerful merchants wishing to increase land holdings were instrumental in this decision, and factors such as deepening and improving the harbor to augment trade surely motivated this undertaking (see Chapter 2, "Social Network and Process"; also Edwards 1917:91-97); but related factors, environmental as well as social and economic, also may have played a decisive role.

As previously noted, New York City's harbor was considered one of the finest in the world (see Chapter 2); apparently no other port along the North Atlantic coast was so well suited to trans-Atlantic, coastal, and inland trade (Albion 1939:16). With its two rivers meeting in a protected bay, it was relatively ideal for maritime commerce; but for the sailing vessels that were the mainstay of commerce in the seventeenth, eighteenth, and early-nineteenth centuries, the East River provided a safer berth than the Hudson, and the city's first wharf was built from this shore as early as 1650 (Albion 1939:221). This was the beginning of the commercial maritime development of lower Manhattan in general, and the East River in particular. For example, an historian writing in 1756 noted that "the ships lie off in the road, on the east side of the town, which is docked out, and better built than the west side, because the freshets in the Hudson river (sic) fill it in some winters with ice" (Smith, quoted in Valentine 1853:297).

In addition to the relative protection if afforded, the interaction in the seventeenth and eighteenth centuries between New York City on Manhattan Island and Brooklyn on Long Island also may have been a consideration in the development of the city's East River shore. Within twenty years of Manhattan's settlement, ferries began plying between the two developing areas (Peterson 1917:139). With cattle, produce, and people coming from Long Island to the city, this interaction may have been integral to the alteration and growth of this section of Manhattan.

While the East River was better suited to early maritime development than the Hudson, and while interaction between lower Manhattan and Brooklyn may have been related to its development, several other factors were probably involved in the decision to concentrate land-making in this area. Among them may have been the fact that the southern segment of the East River was better suited to development than was its rockier shore to the north (Kardas and Larrabee 1980:17). In addition, as long as attack from the north and the interior by Indians and the French was a consideration--that is, until after 1760--consolidation of the city was a defensive mechanism (Shenton 1982: personal communication; see Stokes IV 1922:396-7, 449, 455, 533, 593). With defense and consolidation among the variables, and with the Hudson River the potential avenue of attack, the East River was the logical focus of commercial development. These factors, among others, may account for expansion into the East River rather than to the north when expansion was called for.

GENERAL DEVELOPMENT OF LANDFILL IN LOWER MANHATTAN

From its beginnings as an established trade artery, even before actual landfilling began, the East River waterfront was altered by its inhabitants. Late in the 1640s, when the Dutch were planning to build the river's first dock, they were also communally altering the shoreline by erecting sheet-piling to prevent erosion (Stokes IV 1922:110-111). Apparently, noting that the condition of the bank of the East River near the City Gate (present Pearl and Wall Streets) was bad, in 1656, a "firm sheeting of thick plank and boards" was ordered to replace, raise, and extend the sheet piling installed along the waterfront a decade earlier (Stokes IV 1922:164), and by 1660 a similar directive was given to both East and Hudson River waterfront dwellers (Stokes IV 1922:203) along Manhattan's southern tip.

After 1686, undoubtedly because increased wharfage meant more and better trade possibilities, waterlots along the city's east shore to Beekman's Slip found a ready market. Apparently indicative of the desirability of remaining near the city dock (Peterson 1917:85), and thus in the commercial hub, these lots sold for lower prices as they went north. For example, lots from Wall Street to Maiden Lane sold for 25 shillings per front foot while those from Maiden Lane north to present day John Street sold for 18 shillings per foot, and from John Street to what is now Fulton Street for 15 shillings per foot. By 1692, the corporation had collected 594 pounds from the sale of these lots (Black 1891:19-21). Directives were issued periodically that water lots were to be filled (Peterson 1917:85). Gradually, officially, landfilling began along the East River shore.

As previously discussed, many sophisticated land-building techniques were probably known to Manhattan's settlers. Certainly the city's Dutch inhabitants were familiar with the techniques of land reclamation. It has already been noted that in New York City the initial procedure appears to have been to build wharves or piers extending into the river. By selling water lots, the corporation theoretically put the onus of building these constructions on the lot owners and, after 1734, when the Corporation leased rather than sold land, on the land's lessees; however, where a street ended at the river, the city shared the expense with the landowner (Peterson 1917:86). In return, the owner increased his or her dockage and the potential for trade.

Theoretically, lot owners were to fill in the designated block within a prescribed time period. Often this stipulation was not met and fines were imposed for non-compliance. For example, a 10 pound fine was collected per unfilled lot between Coenties Slip and Moore Street in 1691 (Stokes IV 1922:366). The wharf ultimately built in this area became Water Street about one quarter mile south of the 175 Water Street block.

DOCUMENTED LOCAL FILL TECHNIQUES

It already has been noted that historic documentation does not record the details of New York's eighteenth-century landfill techniques (see also Harris 1980:7), but there are clues to these techniques in the city records. Although scanty, this information suggests that several traditions known historically were used in lower Manhattan.

In the Minutes of the Common Council, references are found to "sinking a block" of timber, or permission to "lay a block" (MCC 1905 8:30; MCC 1917 1:47-48). Although the latter reference, alluding to fill on Fulton Street, postdates fill activity on the 175 Water Street block, both suggest that a persisting proceduring involved utilizing large pre-fabricated wooden constructions. This is further documented by a reference to sinking "wharfs" in front of South Street to fill in water lots (MCC 1917 2:619; see also Waite and Huey 1972:3).

In 1770, a "block" 20 feet wide by 30 feet long was to be added to a wharf at Peck's Slip, several streets north of 175 Water Street. The "block" was to act as a bulkhead (MCC 1905 7:22). This again implies a large timber construction built as a retaining wall; but it was more than just a retaining wall. It was apparently an extension of the existing wharf or pier and it served to make land. It will be seen that a similar process apparently occurred in filling the 175 Water Street block.

A later reference in the Council Minutes describes a timber box filled with stones to cause it to sink (MCC 1917 1:47-48). All of these maneuvers apppear to be variations of Vitruvian principles and the techniques employed or suggested by Renaissance engineers and architects.

While the cribbing and fill technique suggested by Scamozzi for use in tidal situations is not referenced in New York City's early records, derelict ships, which he had noted could be used as foundation footings, are documented. Clearly they were available as a fill resource (see also Chapter 2, "Social Network and Process"; also Brouwer 1980; Henn et al n.d.).

As early as 1729, the city dockmaster was ordered to initiate removal of several boats and wrecks that had long been nuisances in the city's dock and slips (MCC 1905 3:477). Again, in 1769, it was noted that a wreck was removed from a slip (MCC 1905 7:157). It appears when removal of a ship or wreck located all or partly in city slips was an issue, it was documented (for example, see Chapter 2). But it also appears that if ships did not involve or interfere with city properties, which apparently was the case with the ship at 175 Water Street, no record was kept.

It can be seen that although there are no detailed or specific accounts of the eighteenth-century landfilling techniques used in lower Manhattan, suggestions are available in the historic documentation to alert archaeologists to what may be found. And there does appear to be a European traditon based on antiquity from which we can draw. Ultimately, however, the archaeology of this landfill will document technical variations and adaptations unique to the American situation, much as it has documented the European tradition (e.g., Baart et al 1977; Milne and Milne 1978).

LANDFILL AS A LOCAL ADAPTATION

As discussed in Chapter 2, David Stevenson, a European engineer visiting New York City in the 1830s, remarked on the almost "profligate" use of wood he saw in the city's wharves and piers. He also noted that wood was cheap, readily available, and easily used. Since England, among other European

countries, had seriously depleted its wood supply long before American settlement, the magnificent forests found here must have been a welcome resource (Hindle 1975:3). These forests, which provided fuel and construction material, were the basis of early American technology (Hindle 1975:12). Obviously, if feasible, this resource would be a natural component of any landmaking maneuvers in the city.

Although wood does not have the longevity of stone, when constantly wet and deprived of air by submergence in water or wet earth, it will not rot (Greene 1917:4-5). While post-Renaissance Europeans used wood to act as buffers between their stone quays or wharfs and docking ships, American wharves were either entirely made of wood or at least faced with it, providing natural buffers. With its availability, relative longevity, and appropriateness as a building material, it is not surprising that wood became a major component of harbor alterations in lower Manhattan.

New York's wooden quays, actually wooden bulkheads or cribbing filled with earth, described by Stevenson in the 1830s (see Plate 5.1) were actually a less intensive use of wood than has been found archaeologically on earlier eighteenth-century fill sites. In fact, as shall be seen, of four sites excavated to date in lower Manhattan, only two revealed this bulkhead-type construction. It is possible that this more traditional bulkhead and fill situation observed in the first half of the nineteenth century may at least in part reflect a depleting wood supply, or a decrease in the easy availability of this resource.

New York City's eighteenth-century engineers, or their early American equivalent, not only had easy access to wood as a building material, but conditions were such that landfilling was part of an environmental process. In part it was intrinsic to a river environment; in part it was the direct result of urbanization and the requirements of a growing population. The former situation relates to prevailing conditions in the East River; the latter was an outgrowth of urban development with its attendant problems of providing facilities for trade, transportation, and sanitation. In the eighteenth century, the East River provided a solution to these problems.

The East River is not in fact a true river. Like Manhattan's other two "rivers", the Hudson and the Harlem, it is technically a tidal strait, or estuary (Schuberth 1968:199-200). (The Hudson does not become a true river until it reaches Troy, 130 miles north of Manhattan). As such, it is subject to tidal fluctuations from both the bay to the south and Long Island Sound to the north. In its present condition, the East River has been likened to a bowling alley with polished sides, moving everything swiftly in its channel. But part of its modern aspect is the effect of alterations to the waterfront, particularly the gradual narrowing of the river through successive episodes of landmaking. The narrower its channel, the faster a river flows; the faster it flows, the less sediment is deposited (Braynard 1982: personal communication). Consequently, there is conceivably less accretion today than there was before and during landmaking in lower Manhattan.

Recent (1976) dredging requirements and conditions at the South Street Seaport piers (Clark 1982: personal communication) suggest that sedimentation occurs at a rate of approximately two feet annually in the pier area of

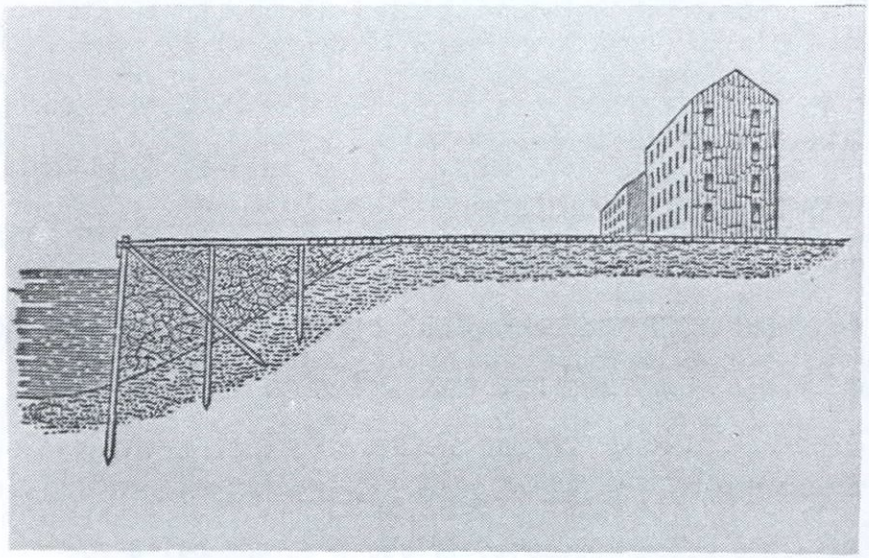


Plate 5.1: This illustration from Stevenson's 1838 book shows a profile of the timber and earth wharves he observed in New York City. Stevenson, a Scotch engineer, visited North America in the 1820s and recorded New World engineering techniques (New York Public Library).

the seaport (Braynard 1982: personal communication). This coincides with the rate reported in an 1856 testimony regarding sanitation. At that time it was estimated that slips accumulated two feet of mud annually from sewer deposits, street-wash, night dumping of domestic and industrial waste, and ships' rubbish washed from the river's stream (Squires 1981:61). Because of a slower river flow, if anything, sedimentation rates in the seventeenth and eighteenth centuries were greater than they are now or were in the mid-nineteenth century (Braynard 1982: personal communication). As piers and slips--acting as traps--were built, the natural rate of filling in the slower moving river probably would have been somewhat greater than it is today, or more than two feet per year.

Sedimentation and harbor build-up have played an important part in the landfill process of maritime cities throughout history; for example, the medieval port of Bergen, Norway, is believed to have extended outward with the build-up of refuse dumped into the port over hundreds of years. In some areas waterfront houses rest on 30 feet of compacted refuse, and over time, in addition to deliberate land building (Baart et al. 1977:29), the quay was extended as the land apparently filled naturally (Herteig 1959). New York City's eighteenth-century records indicate that slips and docks had to be cleaned periodically, strongly suggesting that similar potential fill situations existed along its waterfront.

The Minutes of the Common Council from 1766 to 1772 document that Burling Slip, the northern boundary of the 175 Water Street block, had to be cleaned and dredged at least four times in these six years, with each cleaning ranging from fifty to ninety scow loads[3] of material (MCC 1905 7:43, 119, 171, 368). Given the implied deposition in slips, the quantity to be removed is not surprising. In addition to sedimentation, cast-off debris, and dumped sand-ballast from docked ships, a refuse drain installed at Burling Slip in 1761 (MCC 1905 6:258) undoubtedly added to the build-up.

The dredge material from slip-cleaning may have gone to other fill sites, just as earlier cleaning of other slips (e.g., MCC 1905 5:274) may have been used to partially fill the 175 Water Street block, but this is speculation. However, as part of the fill process, it is likely that at some point the accumulating sediment and debris were left around the docks and piers built in anticipation of filling the block.

Much of the material encountered archaeologically in tests to determine river bottom at 175 Water Street -- such as oyster shells from fishing industries and leather fragments from tanneries in the area (Valentine 1853: 277-278)--is probably harbor fill. Large bottle fragments, often with necks still corded and wired indicating breakage and discard, and wood chips, possibly related to ship building or repair, all seem typical of seaport refuse. In addition, the organic matrix of the fill appears to indicate street runoff or garbage laden with waste material.

It is predictable and apparent that one kind of fill found at a site such as 175 Water Street would be harbor-related; yet another would be the domestic garbage that was an available and typical source of fill. This latter fill, which is documented at harbor sites both in Europe and the United States, is typified by relatively small sherds of glass and ceramics,

kitchen trash, such as bone, fish scales, shell, or vegetal debris, and the miscellany of discarded household supplies. An occasional coin may suggest a date for the deposit.

It is also conceivable that other fill sources might have been tapped to make the 175 Water Street block. Fill could consist of soil from various topographic alterations as was the case in 1692 when Beekman's Hill was partially leveled for just such a purpose (Peterson 1917:86). Or, extrapolating from the records, it might be clean fill perhaps from as far away as Vermont, as was the case in 1825 when 20 or 30 oxcarts carrying dirt from the northern part of the state made the 300 mile journey to provide fill for the meadows at Corlear's Hook (Anon. 1825) north of the site. But clean fill, which was called for in 1796 (MCC 1917 2:295), may not have been an element of landfill until the malevolent properties of the usual trash-based source were fully recognized.

Circumstances documented in the 1790s, and therefore after the 175 Water Street block was filled, indicate a growing awareness that city garbage was dangerous and unsuitable as a fill material, particularly in the form and manner it was then being used. As this time, the street filth and dead and decaying animals deposited behind the bulkhead of expanding docks, or used as fill material for incomplete or sunken lots, were linked to the summer epidemics of yellow, or dock, fever that plagued the waterfront area of the city (Bayley 1799). (Interestingly, not until the early-twentieth century would the role of the mosquito, rather than the dampness and filth itself, be implicated in the transmittal of the disease [Cartwright 1972]). This pestilence had struck the Burling Slip area several times, and the first case of the epidemic of 1796 was reported in a building on the slip (Bayley 1799:51).

In correspondence compiled in 1799 by Richard Bayley, the city health officer, the abominable conditions of the wharves, slips, and incomplete lots are vividly described. For example, the following description of conditions at Burling Slip where fill procedures were at the time suspended, was given to the Common Council in July, 1797, by the commissioners of the health office:

> Burling Slip is at present in a state of alarming nuisance; and that from the constant accumulation of dead animals, offals, and other perishable substances, which lie putrifying on the mud and stagnant water within the Bulk-head, is hourly becoming more so. [The commissioners] therefore beg the Common Council will order that the filling up (which appears to be suspended) may go on, and be speedily completed (Bayley 1799:51).

Bayley went on to quote from the owner of Fitch's Wharf, where the fever began in 1795: "The ponding of water, by running a bulkhead across an unfinished dock, and leaving the vacancy for several years to be filled up with every species of filth and perishable matter, is an object worth the attention of the police." (Bayley 1977:45).

Attempts to eliminate what were recognized as pockets of pestilence are described in Bayley's correspondence. Aided by the hindsight of archaeological fieldwork, these descriptions suggest explanations for some of the features and constructions found on the 175 Water Street block. For example, accumulation of water in lots and yards below street level--a situation documented archaeologically at the site--was a recognized problem: pestilence was anticipated from the "ponding of water in those numerous lots and yards . . . that are several feet below the level of the streets, containing dead animal and vegetal matters and to which the rays of the sun have full access" (Bayley 1799:97-98). Bayley notes that south of the project area a problem segment of waterfront had been successfully drained or, where this was impossible, covered with clean earth to eliminate the problem. It will be seen that at 175 Water Street, minor bulkhead or cofferdam-type constructions may represent attempts to channel and drain pockets of stagnant water and raise settled land.

Obviously, based on the information presented here, several fill-related constructions are to be expected on lower Manhattan fill sites. For example, evidence for log wharves or grillage systems, perhaps in "blocks," as well as docks, piers, bulkheads, discarded ships or wrecks, and earth fill might be present unless, or course, subsequent major disturbances have obliterated them. In addition, there might be evidence for secondary draining and fill maneuvers. And finally, there may be various fill materials present, ranging from ships' ballast to harbor materials, to household and commerical rubbish and waste. This is in addition to the occupation debris accumulated by the inhabitants of the structures subsequently built on these fills.

Admittedly, these are not true hypotheses since they are based not only on the research presented here, but also on the information provided by four months of fieldwork on the 175 Water Street block and on relevant local archaeology. These postulates represent an attempt to recognize the archaeological remains of adaptations to a given economic, social, and physical environment. What they are, in fact, is an attempt to understand many of the complex, often puzzling, constructions found during archaeological investigation of the 175 Water Street block.

175 WATER STREET LANDFILL: MAP DOCUMENTATION

As noted in the History Section (Chapter 2), beginning with 1730, maps relevant to the site area are available, and this documentation was utilized in an attempt to date the making of the 175 Water Street block. Beyond the information it could or could not provide, research indicated that interpretations of these data should be tempered with caution. Often, to understand what is being depicted, it is necessary to understand the circumstances of a map's execution; that is, by whom, for whom, or under what conditions the map was surveyed and drawn. For example, of seven maps documenting the site area from 1730 to 1767, only three are considered highly accurate. Of these, two versions of one map are sufficiently different to affect the fill interpretation of the 175 Water Street block.

The first American produced map survey of New York City (Bradford/Lyne 1728), A Plan of the City of New York from Actual Surveys made by James Lyne, is considered excellent (Stokes I 1915:254-260). However, although dated 1728, it is believed that the map could not pre-date 1730 (Stokes I 1915:257). Since the water lot grants for the 175 Water Street block were not issued until 1737, the date discrepancy does not affect block interpretations, but it does illustrate the need for caution in using early maps as definitive documentary sources.

The David Grim map, A Plan of the City and Environs of New York, dated 1742-1744, was actually drawn from memory 69 years later and must also be used with caution. When he was 76, Grim, an apparently careful and caring early chronicler of New York City, drafted a plan depicting the city as he remembered it at 13 (Stokes I 1915:270). Conceivably accurate, both the 175 Water Street block and its northern neighbor, the Telco block, are shown partially developed; but understandably, the map's accuracy is open to question.

Even the Maerschalck map, A Plan of the City of New York from an Actual Survey, Anno Domini M DCC LV, for which the city surveyor, F. Maerschalck, apparently used a survey in 1754 to build on the earlier Bradford/Lyne map (Stokes I 1915:274), raises some questions as it answers others. Two versions of the map are available; both define the 175 Water Street block. Yet, the constructions on the block are different on the two maps. The copy in the map room collection in the New York Public Library -- published in Valentine's 1849 manual -- indicates development along Fletcher Street, the block's southern boundary, and the southern and northern extremes of the Water Street side (Plate 5.2). The original map (Stokes I 1915: Plate 32), and similar versions in the New York Historical Society and the Library of Congress (Stokes I 1915:274), indicate that construction was then actually limited to the Water Street side of the block (Plate 5.3), an obvious discrepency. What both versions appear to confirm, however, is that at this time the water lot grants were surveyed and, if the block was not yet fully established, it was at least defined. This interpretation is suggested by a 1755 advertisement declaring that "Water Lots, with the additional New Lots & c & c. to this present Year", among other features, were to be found on the map (Stokes I 1915:275). In fact, this map appears to be documenting the fill process of the 175 Water Street block. Simplified versions of Maerschalck's map, dated 1763 and 1765, give less detail and, therefore, less conclusive fill information (Stokes I 1915:275).

A third surveyed map, Montresor's A Plan of New York and its Environs to Greenwich . . ., was first issued in 1766 (Stokes I 1915:339). Although theoretically from survey, the charting of the map was apparently an undercover operation conducted by the British during the suspicion and unrest of the Stamp Act years. Even in its time, it was considered highly inaccurate and "full of gross errors" (Du Semitier 1768 quoted in Stokes I 1915:340). Although the block may have been, and indeed probably was, in place, it was not until the following year that the highly regarded Ratzer/Ratzen Plan (Stokes I 1915:343; Cumming 1979) acceptably documented that it was established. It should be remembered, however, that neither of these maps documents the block's building development.

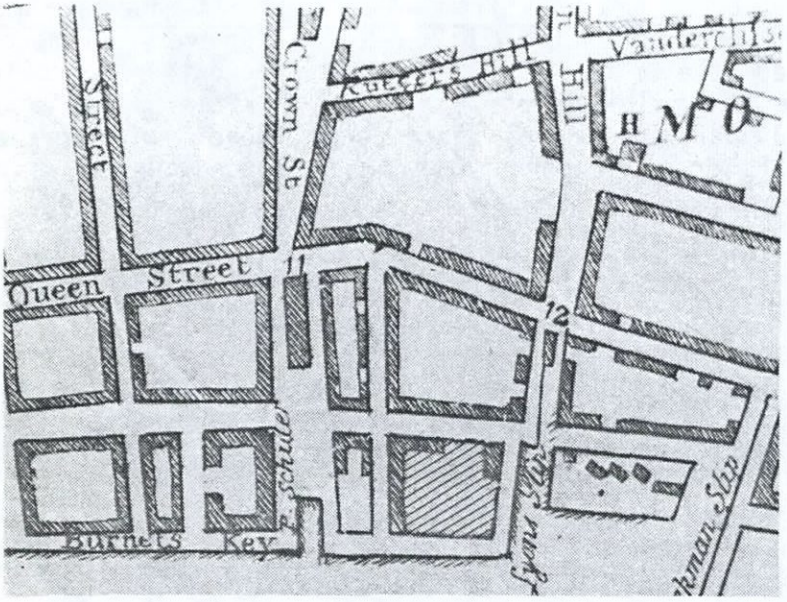


Plate 5.2: Detail of Maerschalck's map as found in Valentine's 1849 manual (diagonal lines define the 175 Water Street block). On this map, from the New York Public Library Map Room, the depiction of the block's development differs from the original (see Plate 5.3).

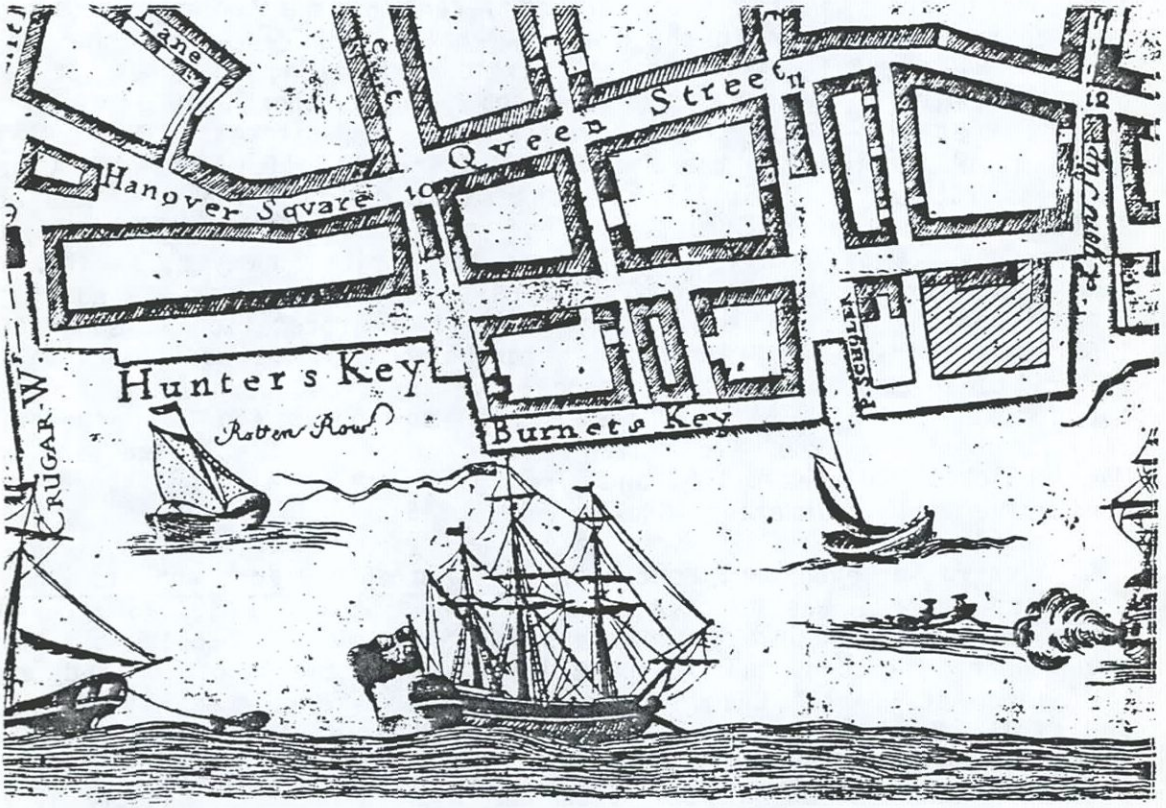


Plate 5.3: Detail of Maerschalck's 1755 plan of New York City (diagonal lines define the 175 Water Street block). In this version of the map, it can be seen that the block's development began on its western edge. Since 1956, when the street was widened, most of this section of the block lies under Water Street (Library of Congress).

In summary, reliable information from three published maps establishes a broad fill sequence for the 175 Water Street block. They document the fact that the block did not exist prior to 1730 and that it had been surveyed and its western section constructed by 1754, the year of the Maerschalck survey. At this time its eastern limit appears defined if not yet developed. By 1754, the 175 Water Street block may have been in the active, if slow, process of filling. Perhaps by 1766, but more certainly by 1767, the block appears to have been an established addition to Manhattan's landmass.

Therefore, three of the seven maps discussed here appear to acceptably document the before, during, and after of the initial fill process of the 175 Water Street block. Although they do not provide precise dates for this process, as noted previously, they suggest that the block was established at least six years prior to 1773 when water lots on the next block east were granted.

WATER LEVELS AND THE 175 WATER STREET SITE

Archaeology provides independent evidence to aid in understanding the changing environment of the New York City waterfront, including changes in local mean sea level. Since its inception as reclaimed land, the 175 Water Street block has apparently been subject to the effects of rising sea level in the New York harbor.

During excavations, water in archaeological units was a problem at certain depths. As noted in the field report for the yard excacations (Chapter 3), once sub-basement levels were reached, pumps were used to dewater. Ultimately, a deeptest (14a) became a water removal point, a sump from which water was extracted to keep the Water Street side of the excavations workable. Based on this experience, and the multi-layered mid- to late-nineteenth-century basement floors encountered in almost every lot, it was assumed that similar water problems plagued the block's earliest occupants. However, it appears that earlier environmental and man-made conditions were somewhat different.

Research into documented changes in mean sea level indicates that this level and, therefore, water table levels were once appreciably lower in the site area; and archaeology indicates that over time the land mass slowly had been built up as well as out, with the higher ground surfaces probably providing dryer conditions.

Documentary evidence suggests that the trend of mean sea level rise in New York harbor has been toward .008 feet per year, or approximately one foot per 123 years (R. Smith 1982: personal communication; Hicks 1968; see also Kardas and Larrabee 1978). Therefore, mean sea level in the mid-eighteenth century, the time the wharf/grillage system on the block was built, was conceivably approximately two feet lower than it is today. Consequently, although a fluctuating water table level, particularly in a tidal situation, was undoubtedly a factor to the block's earliest inhabitants, the levels

encountered during archaeological investigation were higher than those prevailing during the earlier occupation. This situation is particularly interesting since top elevations of the wharf/grillage found in lots 19 through 23 (+1.25 ft., +1.17 ft,. +2.38 ft., +2.41 ft., and +1.00 ft. above mean sea level respectively) are consistently only slightly above the current mean sea level, a fixed elevation established in 1929. Even with a lower mean sea level, in an area where daily tidal fluctuation is 4 to 5 ft., this relationship suggests that the wharf/grillage system--which was a foundation for land-building--created a low surface level for the block.

It is possible, however, that additional levels of this wharf/grillage--such as stone-rubble layers used to sink the log constructions or cobble layers used to pave them (see De Crevecoeur quote, Chapter 2)--were removed during the rebuilding that followed the devastating fire of 1835 or perhaps even earlier since several late-eighteenth-century constructions appear to be founded on this log construction (see Lots 20 and 23, Chapter 3). It is also possible that the current elevations of the wharf/grillage logs uncovered archaeologically may reflect both natural settling and the compaction caused by the weight of subsequent fill and structures. But, even if wharf/grillage constructions were once somewhat higher and mean sea level, and therefore water table levels, somewhat lower, water on these eighteenth-century wharves was apparently at least an intermittent problem.

David Grim, cited in the map section of this chapter, noted that at high tide in the eighteenth century the river would often rise to cover the wharves in the slips and sometimes spill into Pearl Street (Stokes I 1915:271). In fact, as noted previously, the tidal phenomenon was an important factor in commerce, with periods of high tide used to maneuver large ships to wharves, piers, and docks for loading and unloading (see Chapter 2, Engineering); indeed, these constructions may have been built relatively low to facilitate dock activities.

But when buildings were to be constructed above the docks, piers, and wharves, the original ground surface-mean sea level relationship must have been inadequate. To alleviate this problem, successive land-raising fills appear to have been added to the block. These are the variously dated fills into which occupation features, such as privies, cisterns, and late-eighteenth-century walls were built. Excavation indicated that many of these features extended down beyond the added fill levels, sometimes cutting into the wharf/grillage (see Lot 19, Chapter 3) or, where only soil deposits were present, into fill levels archaeologically designated as original, or primary landfill (see Chapter 3; Table 5.1 this chapter). It is conceivable that it was not until four to five-story brick warehouses were built, especially after the 1835 fire, buildings that required deeper foundations and spread-footing-foundation-beam complexes to support them on fill (see below), or when basements and extension were added to these buildings later in the nineteenth century, that water table levels may have become a serious concern to the block's occupants. This construction, in addition to a slowly rising mean sea level, appears to have created water problems in the nineteenth century similar to those encountered during archaeological investigation of the 175 Water Street block.

PRIMARY AND SECONDARY LANDFILL ON THE 175 WATER STREET BLOCK

Data relevant to the land making construction and deposits excavated on the 175 Water Street block are presented here. Fill analysis is based on these data augmented mainly by information from analysis of ceramics and glass that suggested dates for these constructions and fills (see Chapter 4).

In addition to any primary or land-making fill from the lowest levels of occupation-related features, fill data from four deeptests, two of them dug on either side of a common wall, are also presented. These tests were undertaken not only to determine the depth of fill to river bottom, but also to test for any bulkhead, pier, or cribbing constructions that might exist on the block. Prior to digging the final deeptest in Lot 33, the test in which the exterior port side of the ship was first exposed, no cribbing had been uncovered, nor had the wharf/grillage complex, later seen to cross-cut lots 19 and 23 and beyond (Figure 5.1), been extensively exposed. To a degree, the information presented here is an example of the growing awareness of just what may be represented by constructions uncovered during excavation of a filled city block. But before proceeding with a discussion of fill on the 175 Water Street site, definition of relevant terms seems appropriate.

There are several reasons for the "wharf/grillage" designation given to the massive log constructions exposed in five lots at 175 Water Street. This solid, raft-like log construction is identified as wharving partially from historic documentation which describes timber blocks, or wharves, weighted with stones as an initial step in the landfill process (see Chapter 2). It is also based on the engineering literature where a wharf is described as "a structure at which vessels may land and load their cargoes and passengers . . In most localities the name is applied to marginal structures" (Greene 1917:1). In addition, it is based on information from the Telco site where log constructions similar to those on the 175 Water Street block were correlated with documented wharves (Rockman et al. 1983:37-72). And finally, and perhaps tellingly, it is based on the late-seventeenth-century definition of a wharf as "rafts of many pines or firs" (Murray 1888). "Grillage" has been added to the wharf designation since it is the architectural term for this type of cross-layered, load-bearing construction used on unfirm ground whether or not is is destined to serve as a wharf (Nistal 1982: personal communication; Harris 1975:234).

The definition of piers and docks is again taken from the engineering literature which describes a pier as a "wharf projecting from the shore" and a dock as "an artificial basin for the use of vessels" (Greene 1917:1). The same source defines a "bulkhead" wall as a designation given in New York City to a retaining wall on a wharf or pier (Greene 1917:1-2); further, it is noted that filled-in piers or marginal wharves require a wall to retain the fill (Greene 1917:3). In this report, such retaining walls are also called bulkheads.

Several constructions which may at least partially fit definitions of cofferdams have also been uncovered at the 175 Water Street block. A cofferdam is a watertight enclosure or construction placed or built in waterlogged soil or underwater which is then pumped dry so that construction or

repairs can proceed. It will be seen that at least one cofferdam-like construction on the 175 Water Street block appears related to secondary or subsequent fill episodes used where fill may have subsided, a situation described historically (see Bayley, above).

As noted in the introduction to this chapter, "primary fill" refers to the material used in the initial land-making process, a process that may have occurred in stages or episodes. "Primary" fill is often used interchangeably with "original" landfill. "Secondary fill" refers to land-building procedures employed to raise areas of sunken primary fill. Usually, these "secondary" fills were associated with constructions and were apparently attempts to eliminate standing water and to build up low yard areas. Occasionally, a secondary fill associated with preparations for subsequent building is termed "engineering" fill.

With these definitions in mind, the original or primary landfill maneuvers found on the 175 Water Street block are presented.

Primary Fill Constructions and Deposits

The eighteenth-century primary fill constructions found on the 175 Water Street block are not unique. Wharves analogous to the 175 Water Street wharf/grillage were found at the Old Slip (Huey 1969), Schermerhorn Row (Kardas and Larrabee 1978), and Telco (Rockman et al 1983) sites. In addition, a ship as a fill-related feature has been partially excavated at the 209 Water Street site (Henn et al n.d.), and a bulkhead in association with the 175 Water Street ship, the "Ronson," but which was not excavated or documented, was apparently similar to constructions excavated at the Telco site. What was unique at the 175 Water Street site, however, was the degree of exposure of most of these features and the site-specific information recovered relating to both the material and process of primary fill.

Much of the information presented here was extracted from the text and locus appendices found in the field reports for the yard and ship excavations (Chapters 3 and 6 respectively) combined with chronologies derived mainly from ceramics and glass. When relevant, these data were correlated with additional chronological information such as coin dates or manufacture dates on clay pipe stems. As mentioned earlier, the most extensive sampling of primary landfill occurred in the four backhoe trenches (DT14a, DT29/30.01, DT29/30.02, and DT33.08) excavated as deeptests to determine river bottom. Other levels of this fill were occasionally hand-excavated in lot fill, but more often they comprised the lowest levels of fourteen hand-excavated occupation-related features located in ten backyards.

It should also be noted that all the deeptests and many feature-related primary fills were tested with less than 100 percent samples. For example, samples from deeptests comprised seven excavation buckets of material from approximately each twelve inch level; a sample of every tenth excavation bucket was retained from the ship fill; and the sample of original landfill from features often ranged from every second to every fourth bucket. Therefore, many of the dates derived from these small primary fill samples may be

less than conclusive. Both the very early fill dates, which may represent an incomplete sample, and those that are surprisingly late, which perhaps represent contamination from later levels, are suspect. Unfortunately, there is no way to adjust for such errors, and chronological patterns, rather than absolutes, may be all that can be gleaned from analysis of these early levels. These patterns, however, appear both valid and informative.

Before proceeding, it should be mentioned that the configuration of the 175 Water Street block has been drastically altered over time. The widening of Water Street in 1956, which cut and straightened the western segment of the block, undoubtedly eliminated the earliest fill constructions from the project (see Plate 5.3). In addition, it is likely that alterations to an adjacent block that deleted 40 feet to make Front Street in the eighteenth century and 10 feet to add a sidewalk in the nineteenth century (Rockman et al:68) also occurred on the 175 Water Street block. In short, both the block's earliest and, conceivably latest fill constructions were not in the 175 Water Street site area. The former were undoubtedly among the block's first piers or wharves; the latter included most of the starboard side of the Ronson ship and any associated constructions.

In order to determine the soil matrices and chronologies of the 175 Water Street primary landfill, two tables (5.1 and 5.2) were compiled. Table 5.1 includes levels within the confines of occupation-related features that extended into original landfill as well as deposits that were related to features but appeared to be relevant to this early fill. These latter deposits were defined by their soil composition and field determined dates. (Based on artifact analysis, several yard deposits defined in the field as possible original landfill have subsequently proven questionable and are not included in the present analysis). The sub-basement levels of the ship excavation were obviously original landfill and, as such, are included here (see Table 5.2).

In this analysis, as in the ceramic and glass analyses found in Chapter 4, mean dates were usually deemed less valid than terminus post quem dates for ceramic and glass (CTPQ and GTPQ). This was particularly so since individual locus levels, rather than entire feature assemblages, were the analytic units of the fill, a fact which often produced exceedingly small samples. Based on the latest beginning manufacture date of an artifact, the terminus post quem provides a date after which the fill episode had to take place but it does not necessarily date the episode. Earlier fills can conceivably be used for later filling, and contamination by more recent artifacts, as mentioned earlier, can also be a factor. Such contamination is recognized more easily in larger samples. For example, a single 1763 bottle seal, such as those found vertically distributed in Deeptest 29/30.01 (Table 5.1), might appear to be a contamination since it suggests a later date than expected for a deep fill. However, a distribution of similar seals through several levels validates this date and suggests that the block's filling continued at least up to 1763. On the other hand, a single 1765 ceramic sherd (debased scratch blue) recovered from the keelson, or from the greatest depth, of the Ronson Ship is more than likely a contamination. Yet, such anomalies cannot be ignored and should provide the impetus to look closely at artifactual patterning.

Excavation in the yards uncovered evidence of the extensive timber wharf/grillage system which not only represented waterfront improvement but also, ultimately, land making on the 175 Water Street block. This system was found to extend somewhat unevenly along Water Street from lots 19 through 23. The implication was that it continued both north and west to an undetermined extent (Figure 5.1). A privy cut into the wharf in Lot 19 clearly showed the log layers laid at right angles and suggested great depth. Here the logs were weighted with a thin stone-rubble layer; however, this did not appear to be the box-like configuration of a true crib construction, but was instead weighted with raft-like log layers. This construction was confirmed when subsequent building-related excavation exposed what appeared to be at least ten similar log layers intermittently weighted with stone rubble fill (Plate 5.4). Because of water in the excavation, the actual number of log courses was undetermined, but this construction appeared almost identical to the massive wharves documented by Huey at Old Slip just six blocks south of the 175 Water Street site (Huey 1969; 1982-1983: personal communication). Here the exposed log ends revealed seven or eight levels of timbers also laid at right angles (Huey 1983: personal communication).

In contrast to the density of artifacts found throughout the site, only one datable artifact was found in direct association with the wharf/grillage on the 175 Water Street block. This was a creamware ceramic sherd located among the privy timbers in Lot 19. Since its 1762 CTPQ post-dates the probable date of building the wharf/grillage (see below), this sherd apparently does not relate to the timber construction, but to the privy itself.

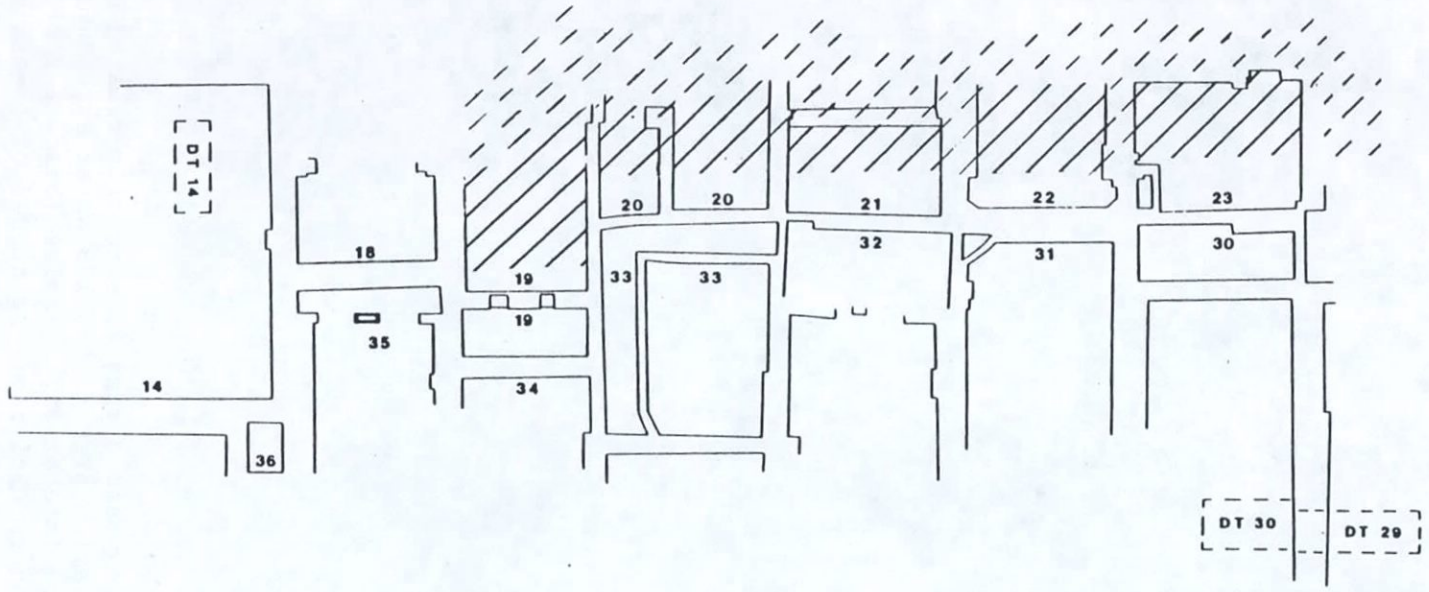
The fill deposits excavated throughout the yards produced chronological data that suggest several succesive fill episodes. First, the fill from the lower levels of the deeptest in Lot 14a, which was part of the original water lot grant to Abraham and Peter DePeyster (see Figure 5.1), appears to be the earliest soil deposit excavated from the yards. Based on ceramics it dates from as early as 1740; pipe stem information raises this date to 1750. A glass date of 1790 from an upper level in this test (14.00.002.2) suggests a subsequent fill episode which was mainly obliterated in the middle part of the nineteenth century during basement construction.

It is possible that the pier or wharf stipulated by the Corporation in the water lot grant to the DePeysters would be found south of this landfill, much as the wharf/grillage probably built by Archibald Kennedy and James Alexander, the water lot grantees for what was to become Lot 19, is to the north. It is likely that prior to subsequent block development these three merchant-speculators shared the docking areas they created with this pier and wharf construction. This is suggested by deposits of coral-sand ballast noted during building excavation (S. Smith 1982: personal communication); similar deposits from the deeptest were originally identified as river bottom but were probably also sand ballast dumped from docked ships.

Unfortunately, filling of the block's individual lots is not well documented historically: no early property maps have been located nor, as discussed earlier, do published maps provide lot-specific fill data. It does appear, however, that historical inference is supported archaeologically.

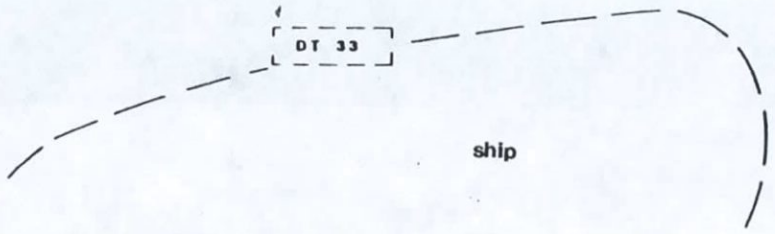
Figure 5.1
175 WATER STREET

Lot Plan
Approximate Extent of Wharf/grillage



KEY

- Wharf/grillage (exposed)
- Wharf/grillage (undetermined)
- Lot wall
- 21 Lot number
- DT 29 Deeptest
- Limit of ship excavation



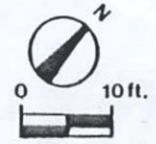




Plate 5.4: Wharf/grillage exposed during construction-related excavation north of the archaeological excavation area on the 175 Water Street block. Note approximately ten log layers laid at right angles (below arrow). Water in the excavation prevented the determination of the number of layers and the ultimate depth of the wood construction. Photo taken February 1, 1982.

Much as the merchants who were water lot grantees on the 175 Water Street block appear to have worked cooperatively in business, they also appear to have worked cooperatively to complete land-making on the block. These merchants are known to have owned or have had access to ships (see Chapter 2, Social Network and Process). The Ronson was either a ship in situ or, more likely, was brought in to structure landfill. Apparently, this derelict ship was supported in its new role as cribbing by staggered piling first seen in Deeptest 33.08 (see Figure 3.58) and later noted during construction-related excavation. It was also tied into horizontally planked north-south running bulkhead off the stern and an east-west system off the bow (S. Smith 1982: personal communciation). These bulkhead constructions may have extended to meet previously-built wharves or piers on the block's periphery, but since this was not tested archaeologically, where the bulkheads ended is unknown.[4]

From the data in Table 5.2, and from the original Maerschalck map (Figure 5.3), it appears likely that the ship defining the block's eastern boundary was in place sometime during or before 1754, the year the map was surveyed; archaeological evidence, however, suggests that actual filling on the block was a long-term process. Here the archaeological evidence appears to refine historic data (see Chapter 2, Historical Research) that imply a 1755-56 date for completion of the filling south of water lot grants 8 and 9. In fact, artifactual evidence suggests that establishing the 175 Water Street block after 1754 was apparently a multi-episodic, long-term process taking somewhere between nine and twenty-odd years to complete.

The descriptions of ongoing land-filling found in Bayley's report cited earlier, where a slow deposit of garbage and debris is graphically described, appear applicable to the 175 Water Street block for some time after 1754. More than likely, for decades it was a block "in a state of alarming nuisance".

In addition to the variously dated fill levels, this supposition was supported archaeologically by a large concentration of butchered animal bones noted near the ship's beak, just east of the ship-related bulkhead. Suggesting large cuts from a butcher's shop (Boesch 1982: personal communication), these bones were perhaps the spoiled discards from an eighteenth-century stall in the Fly Market, a food market located just one block south of the site from 1706 to 1821 (Baugher-Perlin et al. 1982:103; De Voe 1862:127, 238). A cache of broken combed slipware plates found overlying large pieces of coral jammed between the ship's bow and the bulkhead (S. Smith 1982: personal communication) again suggests the filling block as a repository for diverse local trash. And finally, floral analysis of primary fill levels from within features indicates a high percentage of common fruit pits and seeds (see Marco-floral Analysis, Chapter 4) that suggests a fill composed of organic garbage and all it implies.

Secondary Fill Constructions and Chronologies

It also appears that at least one feature from the site--the cofferdam/box in Lot 20 (Feature 49)--may be a secondary fill construction built perhaps to eliminate an accumulation of stagnant water where fill had settled,

the situation described by Bayley. This 6 ft. by 7 ft. feature was constructed of planks laid horizontally on edge with squared-off interior corner supports (see Plate 5.5 and Chapter 3, Lot 20). Only three sides of the construction were exposed, but it is assumed that a fourth underlies, and therefore pre-dates, the wall dividing the yard area of the lot. This "box" appears to be a fill-retaining feature; in this case it may have been constructed to keep surrounding higher fill in place while draining and filling a sunken pocket.

Again, the common fruit pits and seeds from this feature (see Macro-floral Analysis, Chapter 4) imply domestic trash. Ceramics that crossmend throughout the deposit further suggest a single, or short-term, depositional event, and heavy use patterns on these ceramics again suggest household debris. The dates for the ceramics indicate that this deposit of domestic trash occurred sometime between 1790 and 1795 and 1820 (Table 5.3). Although somewhat tenuous, a high percentage of summer fruits (see Macro-floral Analysis, Chapter 4), combined with faunal data (see Faunal Analysis, Report on Major Domesticates, Chapter 4) suggest that this was a warm-weather deposit. This was a time and season when the importance of eliminating stagnant water was apparently recognized and addressed (see for example Bayley, above).

Similarly, all the excavated box features were found to date from approximately this same time (Table 5.3) and all but one again appear to be single or short-term fill episodes. The exception is the box in Lot 32 where lower levels contemporaneous with the other "boxes" are overlain with a somewhat later deposit near the surface, suggesting the use of an established receptacle for the discard of later refuse. Since this feature was in a high, relatively undisturbed yard (see Chapter 3, Lot 32), while the others were located below deeper nineteenth-century basements, comparable later levels in these other features may have been subsequently eliminated.

It is possible, too, that a dense concentration of ceramics excavated from a pocket or "pit" in Lot 23 (F34) was also used to elevate a fill depression. Again, this appears to be a single deposit postdating 1795. The ceramics are particularly interesting since they represent not only one of the largest deposits at the site, but also one of the largest known slipware deposits found locally (e.g., Grossman 1981; 1982: personal communication). In addition, since these slipwares were unused and appear to represent a commercial deposit, and since they were mixed with later ceramics, they may comprise damaged but obsolete merchandise from a china and glass store used to alleviate a nuisance situation (see Ceramics, Chapter 4, Feature 34).

Minor bulkhead-type constructions in lots 19 and 22 (see Chapter 3) may also be related to secondary fill maneuvers, but at present these features remain somewhat enigmatic.

Primary Fill Soil Matrices

The soil descriptions for the fill from 175 Water Street indicate that no single soil matrix is conclusively primary or, for that matter, secondary fill. The soil matrices of the block's primary fill tend to range from brown

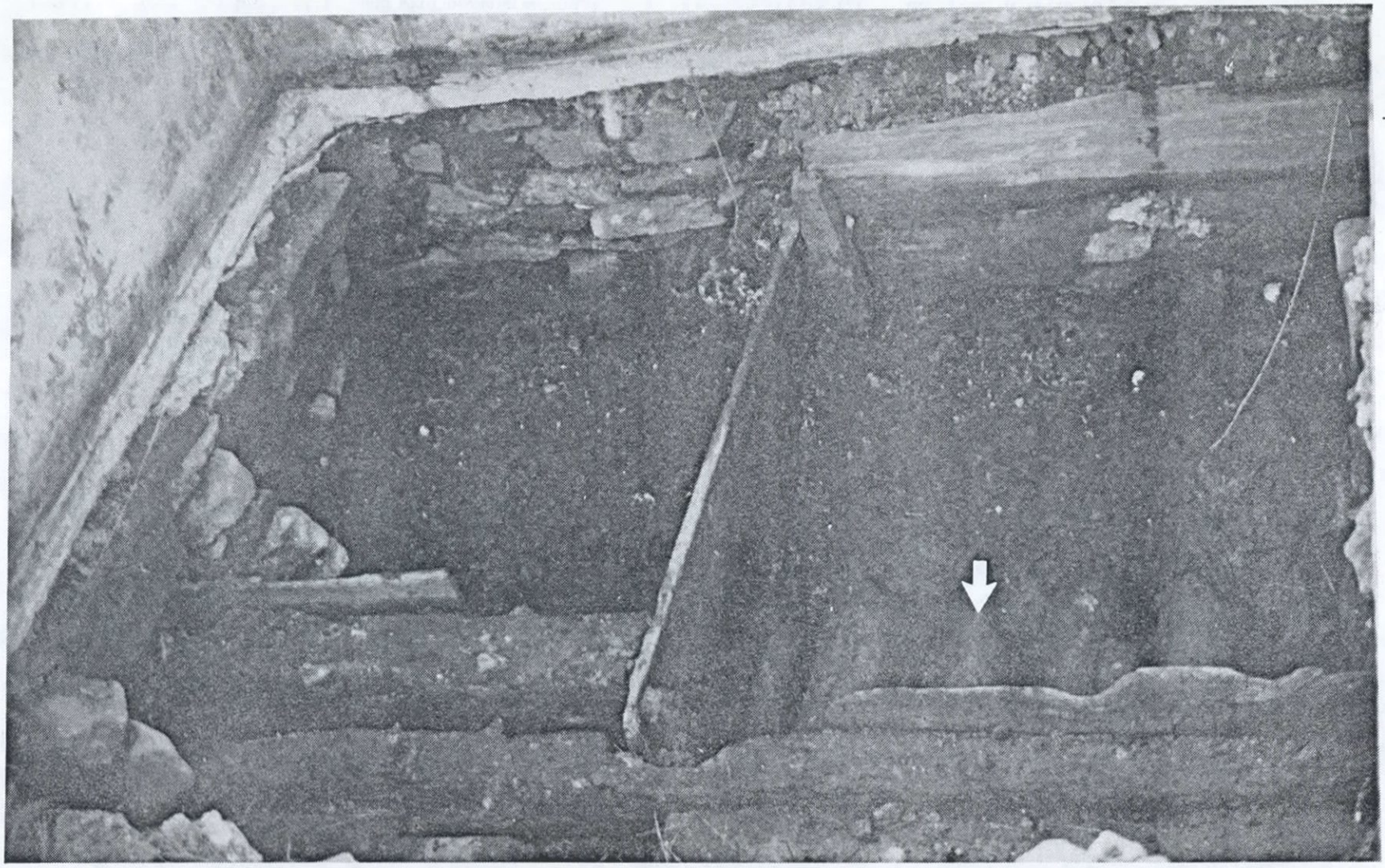


Plate 5.5: Cofferdam/box in Lot 20, three sides visible. This feature, measuring ca. 6 ft. by 7 ft., was built on to the end of the wharf/grillage (arrow) and extended east to the lot's back wall; a fourth side is believed to underlie the wall dividing the yard area into two sections (a second section is beyond the photo to the right). Ceramics from the feature suggest it was built first to drain and then to raise sunken fill.

Table 5.1 175 WATER STREET: Primary Fill Matrices and Chronologies--Yard Excavations

Lot	Feature/ Non-Feature Number	Locus	Matrix Description	CTPQ	GTPQ	Remarks
14a	deeptest					
	(603NF)	14.00.002.1	grey sandy silt with wood, leather, and brick	1740	ngd	
	(603NF)	14.00.002.2	brown grey sandy silt with wood	1720	1790	
	(603NF)	14.00.002.3	brown grey sandy silt with oyster, leather, wood	1670	ngd	PTPQ raises date to at least 1750
	(603NF)	14.00.002.4	brown grey sandy silt with with wood and leather	1720	1680	
	(603NF)	14.00.002.5	grey brown coarse sand with coral and pebbles	1720	1680	
	(603NF)	14.00.002.6	light grey silty sand with coral, cobbles, brick, and shell	1720	1680	
	(603NF)	14.00.002.7	light grey silty sand with coral, cobbles, and shell	ncd	ngd	
18	(501NF)	18.01.017	dark grey sand with pebbles	nc	ngd	condsidered a transition to landfill
	(501NF)	18.02.033	grey black sand with shell	1720	ngd	considered original landfill in field
	(501NF)	18.04.011	grey sand with oyster shell under a yellow clayey sand	nc	ng	a shovel test into original landfill
	(F52.9)	18.01.009	grey and black sand inside box	1740	1770	below box feature deposits
	(F53.2)	18.01.017	dark grey sand with pebbles	nc	ngd	below unidentified stone feature deposits
	(F51.9)	18.02.028	brown and tan silt with brick inside privy	1720	ngd	below privy deposits
	(F54.2)	18.04.009	brown clayey silt with mortar and bricks	1720	1750	below cistern base; possible original landfill
19	(502NF)	19.01.028	grey brown silt with wood and oyster shell	1775	ngd	east of bulkhead type board
	(502NF)	19.01.029	dark brown sand with wood, shell, and seaweed	1780	ngd	east of bulkhead type board
	(502NF)	19.02.024	dark grey black silty sand	1780	ngd	
	(F50.9)	19.03.028	dark grey brown silty sand associated with wharf/grillage	1762	1725	beneath privy cut into wharf/grillage
	(F50.9)	19.03.029	rocks and cobbles of second level of wharf/grillage	1762	ng	second level of wharf/grillage under privy
	(F50.9)	19.03.030	black brown silty sand, last level removed from wharf/grillage	1670	ngd	the CTPQ does not reflect a valid construction date
20	(505NF)	20.07.013	dark brown-grey sandy silt from between spread-footer complex	ncd	ngd	from above the wharf/grillage
	(F48.9)	20.02.013	fine sand below the privy, a deposit covering the entire unit	1670	ngd	a PTPQ raises this date to post 1750
	(F48.9)	20.02.014	black sand with charcoal and wood	1690	ngd	considered a transitional level to landfill under privy
	(F47.3)	20.05.008	black silt with limestone cobbles and boulders and oyster shell	1765	1840	inside privy, below privy deposits
	(F49.9)	20.06.009	grey black clayey silt with grey sand	ncd	1680	beneath box/cofferdam feature
21	(F42.9)	21.01.008.2/3	dark brown black silty sand with grey silt and oyster shell	1762	ngd	last levels removed from small privy; PTPQ of 1750
	(F43.9)	21.01.022	greyish black silty sand with shell and wood fragments	1762	ngd	deposit below walls of large privy
	(F44.9)	21.02.016	black silty sand with oyster shell	1720	1760	last excavated deposit in circular privy; 1750 PTPQ
22	(F41.9)	22.02.13	black silt with wood, shell, and seeds	1762	1760	below privy walls
	(F41.9)	22.02.14	dark grey (graphite colored) sand, quartz sand, waterworn pebbles, and shell	1740	ngd	auger test into deposit below privy
23	(516NF)	23.04.058.02	dark brown mottled silty sand with wood, oyster, and charcoal	1744	1750	
	(516NF)	23.04.60	dark brown silty sand with wood	1762	1770	
	(516NF)	23.04.63	grey silty sand with wood and organic material	1780	ngd	identified in field as original landfill
	(516NF)	23.04.64	dark grey brown silty sand with organic material	1780	ngd	identified in field as original landfill
	(F40.9)	23.04.17	tan and grey clayey silt with red and yellow brick and mortar	nc	ngd	last level of unidentified stone feature; PTPQ 1710 (the identification of this level as original landfill remains questionable on artifactual evidence)

CTPQ=ceramic terminus post quem; GTPQ=glass terminus post quem; PTPQ=pipe terminus post quem; TPQ=terminus post quem; nc=no ceramics; ng=no glass; ncd=no ceramic date; ngd=no glass date. Note: unless noted otherwise, "wood" refers to wood chips or fragments.

Table 5.1 175 WATER STREET (continued)

Lot	Feature/ Non-Feature Number	Locus	Matrix Description	CTPQ	GTPQ	Remarks
33	deeptest					
	(523NF)	33.08.002.1	dark brown and grey brown silty sand with wood	1762	1680	post uncovered in this level
	(523NF)	33.08.002.2	dark brown and grey brown silty sand with stones	1740	ngd	exterior port side of ship first exposed
	(523NF)	33.08.002.3	dark green brown to grey silty sand with yellow and red brick	1780	1680	TPQ of 1755 on a buckle from this fill
	(523NF)	33.08.002.4	dark green brown to grey silty sand with stones and rubble	1740	ngd	
	(523NF)	33.08.002.5	grey brown to dark brown sand with silt and yellow and red brick	1759	ngd	
	(523NF)	33.08.002.6	grey brown to dark brown sand with yellow and red brick	nc	ngd	
	(523NF)	33.08.002.7	grey silty sand with shell and pebbles	1740	ng	
	(523NF)	33.08.002.8	grey silty sand and sandy silt with red and yellow brick and stones	1780	ngd	
	(523NF)	33.08.002.9	dark grey clayey silt	1744	1745	
	(523NF)	33.08.002.10	dark grey clayey silt with wood	1740	ngd	
	(523NF)	33.08.002.11	dark grey clayey silt with wood	1670	ngd	
	(523NF)	33.08.002.12	clayey silt with large boulders	1720	ngd	
36	(F 1.9)	36.01.006	grey brown sandy silt with grey coarse sand and wood	1700	1780	below spread-footers in cistern; transition to original landfill seems likely
	(F 1.9)	36.01.010	grey coarse sand ending in large rocks (36.01.006 and .009)	1740	ngd	shovel test below cistern and lowest levels below spread-footers noted in 36.01.006.

Note: several loci identified as original landfill in the field were not included in this analysis since subsequent artifact analysis appeared to clearly refute this identification.

Table 5.1 175 WATER STREET (continued)

Lot	Feature/ Non-Feature Number	Locus	Matrix Description	CTPQ	GTPQ	Remarks
30	(517NF)	30.01.008	grey brown silty sand with wood, leather, bone, and shell	1762	1780	identified in field as original landfill
	(517NF)	30.01.015	grey silty sand	nc	ng	barrel staves (F3b) extended into this level (the identification of this level as original landfill remains questionable on artifactual evidence)
29/30.01 deeptest			[designated 93.01 for computer]			
	(F55.1)	29/30.01.002.3	grey brown clayey silt	1780	ngd	spread-footers for 29/30 wall in this level
	(F55.1)	29/30.01.002.4	dark brown sandy silt	1744	1763	
	(F55.1)	29/30.01.002.5	dark brown sand with wood and coral	1763	1763	
	(F55.2)	29/30.01.002.6	dark brown sandy silt with wood, shell, and brick	1812	1763	
	(F55.2)	29/30.01.002.7	dark brown sandy silt with wood	1744	1763	
	(F55.2)	29/30.01.002.8	dark brown sandy silt with wood	1744	1745	
	(F55.2)	29/30.01.002.9	grey brown sandy silt with brick, mortar, and shell	1744	1763	
	(F55.3)	29/30.01.002.10	brown grey silty sand with brick, mortar, and shell	1744	1745	
	(F55.4)	29/30.01.002.11	dark grey clayey silt	1740	ngd	
	(F55.4)	29/30.01.002.12	dark grey clayey silt with wood, shell, and charcoal	1720	ngd	
	(F55.4)	29/30.01.002.13	banded grey brown and black clayey silt	ncd	ngd	
	(F55.4)	29/30.01.002.14	black to brownish grey clayey silt with some grey sand and pebbles	1744	ngd	
	(F55.4)	29/30.01.002.15	grey black sandy silt and silty clay	1744	1745	PTPQ raises date to at least 1750
29/30.02 deeptest			[designated 93.02 for computer]			
	(F55.1)	29/30.02.002.1	reddish brown sandy silt with black sandy silt	1670	ngd	PTPQ raises date to at least 1710
	(F55.1)	29/30.02.002.2	reddish brown silty sand with organic material, brick, and shell	1744	1790	
	(F55.1)	29/30.02.002.3	dark brown sandy silt with red brown sand, organic material, wood, and shell	1720	ngd	PTPQ raises date to at least 1750
	(F56.1)	29/30.02.002.4	dark brown sandy silt with red brown sand	1740	ngd	PTPQ raises date to at least 1750
	(F56.1)	29/30.02.002.5	dark brown sandy silt with red brown sand	1759	ngd	
	(F56.2)	29/30.02.002.6	reddish brown silty sand with dark grey to black sand	1744	ngd	PTPQ raises date to at least 1750
	(F56.2)	29/30.02.002.7	brown sand with black silty sand	1744	ngd	PTPQ raises date to at least 1750
	(F56.2)	29/30.02.002.8	brown sand with dark grey sand	1744	ngd	PTPQ raises date to at least 1750
	(F56.2)	29/30.02.002.9	dark brown sandy silt with dark grey sand	1744	ngd	PTPQ raises date to at least 1750
	(F56.3)	29/30.02.002.10	dark grey clay with brown sand	1744	ngd	
	(F56.4)	29/30.02.002.11	black to dark grey clayey silt with brown sand	1744	ngd	PTPQ raises date to at least 1750 (ca. 18 ft. below street level)
	(F56.4)	29/30.02.002.12	black to dark grey clayey silt with brown sand	1744	ngd	
	(F56.4)	29/30.02.002.13	dark brown to black clayey silt with wood and shell			
31	no original landfill excavated					
32	(F30.4)	32.02.031	light grey to black oil-stained sandy silt	1759	1790	below box; artifact analysis suggests this may not be original landfill; perhaps a late interface
	(519NF)	32.02.034	dark grey sandy silt with shell	1744	1780	below box deposits (F30); identified as original landfill in the field
	(519NF)	32.02.032	dark grey sandy silt with limestone and coral	1740	ngd	shovel test in bottom of wooden box (F30); PTPQ raises date to at least 1750
33	(F 3.9)	33.01.027	dark brown and black silt with wood	1780	ngd	below barrel-cistern; may be original landfill
	(F 2.9)	33.05.062	grey clay with wood	1762	ngd	inside privy
	(F 2.9)	33.05.064	light grey sand with shell	1720	ngd	inside privy
	(F57.9)	33.05.068	dark grey black silt with wood or leaves	1762	1770	beneath barrel; may be original landfill

TABLE 5.2 175 WATER STREET: Primary Fill Matrices and Chronologies--Ship Excavations

Lot	Feature/ Non-Feature Number	Locus	Matrix Description	CTPQ	GTQP	Remarks
30	(701Sh)	30.00.001	brown black silt with light green clay	nc	1857	the ship's beak was in this matrix
31	(702Sh)	31.00.001	brown black silt with light grey clay	nc	ng	above deck planks; ship's bow in this lot
	(702Sh)	31.00.002	brown red sandy silt with wood and rubble	nc	ng	above deck planks
	(702Sh)	31.00.003	red brown sand with wood and black silt	1744	1790	above deck planks
	(702Sh)	31.00.004	red brown sand with wood	1720	ngd	above deck planks
	(702Sh)	31.00.005	red brown sandy silt with gravel, green clay, and red sand	ncd	ngd	below deck planks; 1729 British halfpenny
	(702Sh)	31.00.006	green grey clay with gravel and white sand	nc	1745	below deck planks
	(702Sh)	31.00.007	black sand and gravel	nc	ng	possible original ballast
	(702Sh)	31.00.010	brown silt	1740	1745	between frame and breast hook
	(702Sh)	31.00.011	Brown sandy silt with brown silt	1744	ngd	between frames
	(702Sh)	31.00.012	brown sandy silt	1744	1770	between porthawse and stem
	(702Sh)	31.00.013	brown sandy silt	1762	ngd	between frames
	(702Sh)	31.00.014	brown sandy silt to greenish clay	1670	ng	between starboard frames
	(702Sh)	31.00.016	brown sandy silt to greenish grey clay	1670	ngd	between port frames
	(702Sh)	31.00.017	brown sandy silt to brownish red sandy silt	nc	ng	between starboard frames
	(702Sh)	31.00.018	brown sandy silt to greenish grey clay	1720	ngd	between starboard frames
	(702Sh)	31.00.019	brown sandy silt	1780	ngd	between port frames
	(702Sh)	31.00.020	brown sandy silt	nc	ng	between port frames
	(702Sh)	31.00.022	brown sandy silt	ncd	ngd	between starboard frames
	(702Sh)	31.00.023-24	brown sandy silt	1720	ngd	between port frames
	(702Sh)	31.00.025	brown sandy silt	nc	ng	between port frames
	(702Sh)	31.00.028	pine needles in brown sandy silt and greenish clay	nc	ng	from barrel (31.00.008) below deck
32	(703Sh)	32.00.003	black sandy silt	nc	ng	above deck planks
	(703Sh)	32.00.004	brown grey sandy silt with black sandy silt	1780	ngd	above deck planks
	(703Sh)	32.00.005	red brown and dark brown silty clay	1762	1745	below weather deck
	(703Sh)	32.00.006	red brown and dark brown silty sand	1744	ngd	below weather deck
	(703Sh)	32.00.007	grey silty sand with coral and grey clay	1744	ngd	below weather deck
	(703Sh)	32.00.008	white grey coral sand	1720	ngd	below weather deck
	(703Sh)	32.00.009	dark brown sandy silt with coral, gravel, brick, shell, and stone	1720	ng	between frames
	(703Sh)	32.00.010	dark brown sandy silt with coral, gravel, brick, shell, and stone	ncd	ng	between frames
	(703Sh)	32.00.011	dark brown sandy silt with coral, gravel, brick, shell, and stone	1720	ngd	between frames
	(703Sh)	32.00.012	dark brown sandy silt with coral, gravel, brick, shell, and stone	1744	ngd	between frames
	(703Sh)	32.00.013	dark brown sandy silt with coral, gravel, brick, shell, and stone	1720	ngd	between frames
	(703Sh)	32.00.014	dark brown sandy silt with coral, gravel, brick, shell, and stone	1720	ngd	between frames
	(703Sh)	32.00.015	dark brown sandy silt with coral, gravel, brick, shell, and stone	1670	ngd	between frames
	(703Sh)	32.00.016	dark brown sandy silt with coral, gravel, brick, shell, and stone	1750	1745	between frames

CTPQ=ceramic terminus post quem; GTPQ=glass terminus post quem; nc=no ceramics; ng=no glass; ncd=no ceramic date; ngd=no glass date.
Note: unless noted otherwise, "wood" refers to wood chips or fragments.

TABLE 5.2 175 WATER STREET (continued

Lot	Feature/Non-Feature Number	Locus	Matrix Description	CTPQ	GTPQ	Remarks
33	(704SH)	33.10.002	dark brown to grey brown silty sand with wood and rocks	nc	ng	above deck planking
	(704SH)	33.10.003	sand, redefined as coral and decomposed shell	nc	ng	above deck planking
	(704SH)	33.11.004	decomposed coral, grev sand, and black silt	1750	ngd	below deck planking
	(705SH)	33.11.006	decomposed coral, grey sand, and black silt	1720	1700	possible secondary ballast below keelson
	(705SH)	33.11.007	ballast and decomposed coral	1744	ngd	possible secondary ballast below keelson
	(705SH)	33.11.008	ballast and decomposed coral	1765	ngd	possible secondary ballast below keelson (the CTPQ may be based on an intrusive ceramic sherd; therefore, dating on this level is speculative)
	(708SH)	33.11.010	decomposed coral with grey clay, wood, and waterworn pebbles	1720	1770	between frames
	(708SH)	33.11.011	decomposed coral with grey clay, wood, and waterworn pebbles	1720	1680	between frames
	(708SH)	33.11.012	decomposed coral with grey clay, wood, and waterworn pebbles	1720	ngd	between frames
	(708SH)	33.11.013	decomposed coral with grey clay, wood, and waterworn pebbles	1744	ngd	between frames
	(708SH)	33.11.014	decomposed coral with grey clay, wood, and waterworn pebbles	1720	ngd	between frames
	(708SH)	33.11.015	decomposed coral with grey clay, wood, and waterworn pebbles	1720	ngd	between frames
34	(706SH)	34.00.001	grey black fine sand with red grey sand, black silt stain, and red brick (this locus also included layers of dark grey silt with light grey clay and tan silt with wood and medium grey silt with oyster shell; these layers had no datable artifacts)	1720	1725	above deck planking, just below lot floor boards
	(706SH)	34.00.001.2	dark brown to medium grey silty sand with oyster shell	nc	ng	above deck planking
	(706SH)	34.01.001	dark grey silty sand with brick, mortar, oyster shell, and wood	nc	1745	above deck planking
	(706SH)	34.03.001	dark grey silty sand	1720	ngd	above deck planking
	(706SH)	34.05.001.1	dark grey silt with sand, grey clay, tan sand, and yellow brick	1740	ngd	above deck planking
	(706SH)	34.05.001.2	dark grey silty sand with wood, flint, and coral	nc	ngd	test trench above deck planking
	(706SH)	34.05.004	4 layers: light grey sand with silt, boulders, flint nodules and fragments; brown silty sand with gravel; grey clay; white decomposed coral sand	1744	1745	ballast and soil deposits below deck planking
	(706SH)					
	(706SH)	34.05.006	dark grey brown sandy silt	ncd	ngd	between frames
	(706SH)	34.05.007	dark grey brown sandy silt	nc	ng	between frames
	(706SH)	34.05.008	dark grey brown sandy silt	ncd	ngd	between frames
	(706SH)	34.05.009	dark grey brown sandy silt	ncd	ng	between frames
35	(707SH)	35.00.001	dark grey black silty sand	nc	ng	outside ship, west of portside of stern
	(707SH)	35.00.002	red brown silty sand	nc	ngd	interior stern of ship
	(707SH)	35.00.003	dark grey lack silty sand	nc	ng	outside ship, between stern and cribbing to west
	(707SH)	35.00.004.1-2	grey brown silty sand	1720	ngd	interior stern above deck planking
	(707SH)	35.01.001	red orange silty clay with grey clay, rubble, oyster, and brick	nc	ng	below deck planking
	(707SH)	35.01.002	red brown clayey silt with black clayey silt, wood, oyster, and brick	1670	ngd	inside and outside stern; predominantly outside
	(707SH)	35.01.003	grey brown slayey silt	1670	ngd	inside stern
	(707SH)	35.03.001	mottled red brown clayey silt with green grey silty sand	1720	ngd	below deck planking
	(707SH)	35.3/4.001.1	light red brown clayey silt with dark green grey organic sandy silt	nc	ng	new designation within stern
	(707SH)	35.3/4.001.2	dark grey black sandy silt	1740	ngd	within stern
	(707SH)	35.3/4.005	mottled grey green tan silty sand with wood	nc	ng	between frames
	(707SH)	35.3/4.006	mottled grey green tan silty sand with wood	nc	ng	between frames

Table 5.3 175 WATER STREET: Possible Secondary Fill Matrices and Chronologies--Yard Excavations

Lot	Feature Number	Feature Description	Feature Level	Locus	Matrix Description	CTPQ By Level	GTPQ By Level	Remarks
32	30	box	1	32.02.015	dark brown to black sandy silt	1820	1813	
				32.02.025	brown sandy silt			
			2	32.02.026	dark brown silt with yellow brown sand and mortar	1795	1780	
				32.02.029	dark brown silt with sand			
			3	32.02.030	dark grey black silt	1780	1790	
			4	32.02.031	light grey to black oil-stained sandy silt	1759	1790	
23	34	pit	1	23.04.028	dark grey sandy silt with wood, brick, and charcoal	1795	1790	
				23.04.029	grey mortar (no artifacts)			
				23.04.030	charcoal grey clayey silt			
				23.04.032	light brown-orange sandy silt with slag			
				23.04.032	mottled grey ash with charcoal and oyster			
			2	23.04.034	unidentified soil (one of many ceramic surfaces)	1795	1790	
				23.04.035	unidentified soil (cleaning of surface)			
				23.04.040	orange mottled clayey silt			
				23.04.042	orange tan clayey silt with white ash, charcoal, and mortar			
				23.04.045	fine dark brown sandy silt with wood			
				23.04.047	cinder pocket			
				23.04.048	green decomposed copper			
				23.04.049	grey brown sandy silt with ash and sand			
				23.04.050	red-yellow to grey silty sand with cinder and charcoal			
				23.04.054	red sand with cobbles			
			3	23.04.051	ceramic surface	1762	1790	
			4	23.04.055	mottled grey black and red sandy silt with red brick, mortar and wood	1780	1790	
			5	23.04.056	oily black sandy silt	1795	1770	adjacent to box (F35)
23	35	box	1	23.04.039	dark grey sandy silt with wood, brick, and charcoal	1795	1790	
				23.04.043	dark brown silt with organic material			
				23.04.052	no soil description (ceramics)			
				23.04.057	no soil description (ceramics and glass)			
			2	23.04.053	grey black sandy silt	1795	1790	
23	36	box	1	23.02.002	dark brown sandy silt	1795	1790	
				23.04.059	dark brown sandy silt			
			2	23.04.061	grey brown to black silty sand with oyster, wood, and brick	1795	1790	
20	49	box*	1	20.06.003	grey brown silty sand and sandy silt	1795	1790	[Feature 49 has been identified as a possible cofferdam-like box]
				20.06.004	dark brown silty and sandy silt with grey sand and clam shell			
				20.06.005	light grey sand			
				20.06.006	black clayey silt with wood and oyster			
			2	20.06.007	light grey sand wit oyster	1790	1780	
			3	20.06.008	light grey sand, brown grey sandy silt, and black silty sand	1780	1790	
18	52	box	1	18.01.004	light brown sandy silt with charcoal and wood chips	1780	1715	
				18.01.006	grey sand with red sand			
				18.01.007	grey sand			
			2	18.01.008	black soil (possibly nightsoil)	1795	ngd	

CTPQ=ceramic terminus post quem; GTPQ=glass terminus post quem; ngd=no glass date. Note: unless noted otherwise, "wood" refers to wood chips or fragments. *This box-like feature is possibly a cofferdam-like construction and is the site's feature most clearly related to secondary fill maneuvers.

to black to grey silts and sands in the yard excavations, with earliest levels including wood chips, shell, and often, leather (Table 5.1). In addition to the brown silt, the primary fill in the ship also included red-brown sand and ships' ballast (Table 5.2). Some of the latter, from the bow section, may possibly be related to the Ronson ship itself. (Unfortunately, no datable artifacts were recovered from this deposit.)

The dark grey, brown, and black silts and sands in the yards, and the brown silty sands and the red-brown deposits in the ship, all show chronological variation. But, as was found at the Telco site (Rockman et al 1983:78) and at other eighteenth-century Manhattan fill sites (Huey 1969; Kardas and Larrabee 1978), in addition to domestic trash, the common component of this original fill is the shell, wood chips, coral and leather in the deposits. Many of these same materials appear in Medieval harbor fill sites (e.g., Baart et al. 1977); in fact, the worldwide prevalence of shoemakers or leather tanners at, or near, many of these sites has been recorded (e.g., Baart et al. 1977:14; Baugher-Perlin et al. 1982:30; Rothschild and Pickman 1981) and can be documented near the 175 Water Street site in the late-seventeenth and early-eighteenth centuries (Valentine 1853:277-278). This may explain the relatively high percentages of scrap leather found in the analyzed original fill levels from the 175 Water Street features and the deeptests in Lots 29 and 30 (see Leather, Chapter 4).

At 175 Water Street, no evidence was noted for the clean fill called for by the Common Council (MCC 1917 2:295). As described above, most, if not all, was artifact laden, and common fruit pits and seeds were major components of the floral material from these deposits (see Floral Analysis, Chapter 4). In addition, three analyzed samples from original fill levels within features were found to contain seaweed, and microscopic seeds and debris included marsh and swamp plant varieties. This suggests both a waterfront location, which is not surprising, and possibly the utilization of water-related local deposits as fill.

Even when depths of approximately nineteen feet below current street level (14.15 ft. bmd or c. 12.5 ft. below mean sea level [See Introduction to Field Report, Chapter 3]) were sampled in Deeptests 29/30, no sterile reddish sand and clay considered river bottom (Huey 1969) was excavated. More than three feet of clay silt observed in the tests (see Figure 3.44) was perhaps a veneer above this level (Braynard 1982: personal communication). Based on Huey's data, it is possible that the reddish sand and clay found at Old Slip might have been encountered had exavation proceeded another foot or so, but the limits of the backhoe's reach made further testing impossible. Nor was a level comparable to the red brown sandy silt found to underlie deposits of dark brown or grey/green sandy silt with shell and wood chips at the Telco site (Rockman et al. 1983:77-78) found, or perhaps reached, even though deeper levels were tested at 175 Water Street. The diversity of these deposits is prehaps indicative of the natural variation of the East River's bottom.

EXPANDING FILL DATA AND UNANSWERED QUESTIONS

Both similarities and variations appear to be the norm at eighteenth-century Manhattan fill sites; each provides information that the other does not. For example, while an expansive wharf/grillage system was exposed at 175 Water Street, no fastenings securing these constructions were observed. Excavation at the virtually contemporary Telco site indicated that these fastenings took the form of interlocking "squared-off notches" as well as vertical pegs used between logs (Rockman et al. 1982:64-65). It is possible that similar fastenings secured the 175 Water Street wharf/grillage. In addition, two wood samples from the Lot 22 wharf/grillage at 175 Water Street that proved to be yellow pine (Pinus) (Christensen 1982: personal communication) were the same as most of the samples from Telco's cobb-wharves (Rockman et al. 1982:65), but more extensive sampling from this latter site indicated that sweetgum (Liquidamber styraciflora) was also used (Rockman et al. 1983:64).

A ship as a New York City fill element has so far been seen most clearly at 175 Water Street. On the other hand, interpretation of the minor bulkheads associated with this ship was aided by data from the Telco block where this traditional fill element was extensively excavated. At both sites the bulkhead comprised horizontal planks fastened to uprights. As noted above, at the 175 Water Street site these uprights included the staggered pilings installed to secure and straighten the ship as cribbbing (S. Smith 1982: personal communication); at the Telco site, the squared-off beams on the water side were reinforced with upright planks on the land side (Rockman et al 1983:68). But, one fill-related factor has not been systematically explored at any of these lower Manhattan sites.

In order for any foundation to function, whether it is a wall foundation or a pre-development fill construction, it must be level (Nistal 1982: personal communication; Stewart et al. 1981:144). The importance of leveling is noted throughout Vitruvius' Ten Books on Architecture (Morgan 1914) and was apparently a consideration to the land-builders of Medieval Amsterdam and Renaissance Europe.

Archaeology has indicated that the Medieval Dutch placed reed and branch "mats" under their wooden fill-retaining features (Baart 1982: personal communication); these underpinnings may have served as leveling mechanisms. Whether a similar or completely different technique was used by the land-makers in mid-eighteenth-century New York City has not been determined. The implied vertical extent of the wharf/grillage at 175 Water Street, and the presumed slope and variation of the river bed, intimated that some leveling mechanism underlies these massive constructions or they would have tilted, rendering them useless as wharves or foundations for subsequent block development. While the Ronson ship was apparently held level by supporting pilings, the nature of the leveling mechanism for the wharf/grillage at present remains unknown.

FILL SEQUENCE AND INITIAL DEVELOPMENT OF THE 175 WATER STREET BLOCK

As can be seen in Tables 5.1 and 5.2, the dates from landfill levels of 175 Water Street indicate an ongoing fill history. An early fill accumulation began by the 1740s or 1750s, and the wharf/grillage in this section of the block was apparently built by 1754 when the ship-cribbing rendered these wharves inaccessible by water. Later primary episodes--that is, the surface levels into which occupation-related features were constructed--appear to date from 1780 or somewhat later. This is most obvious in the high, relatively undisturbed yard in Lot 33.

Here, where no primary fill constructions were found, three deposits identified as original landfill provided terminus post quem dates of 1762, 1770, and 1780. The 1762 CTPQ and 1770 CTPQ came from below a privy (F2.9) and a related barrel (F57.9) respectively; these were among the deepest deposits excavated within the yard of this lot. The 1780 date came from under the wooden floor of a barrel-cistern (F3.9) which was dug less deeply into fill. In addition, a 1740 CTPQ from the lower levels of the deeptest further west in the lot suggests an earlier fill element; this is in addition to evidence for 1762 and 1780 fills found in higher levels.

The mean ceramic date from the deeptest (1746) is earlier than that from general fill in southern and western segments of the yard (1775.5) (Units 5 and 6, 7 and 9 respectively). This discrepancy between the deeptest mean ceramic date and that from the yard undoubtedly reflects the fact that the upper levels of the deeptest, and therefore the greatest concentration of later dates, was eliminated from the sample during basement construction in the nineteenth century. This illustrates the validity of using the terminus post quem to establish dating variability in a situation as complicated as the fill analysis of an altered urban block.

The spread-footer complexes found on the site -- a building foundation used traditionally in a wet environment (Stewart et al 1981:147) -- appear to have been introduced into fill that dates from 1780 or later (for example, see Deeptest 29/30.01, Table 5.1). Since they were needed only after initial fill procedures were complete and block development was in progress, spread-footings are mentioned here in relation to dating primary fill and subsequent block development (See Plate 5.6). Serving to distribute weight in an unstable environment, these wooden planks overlain by right-angle beams were a convention commonly used in early-nineteenth century construction, but it was a technique employed as late as the 1870s (Stewart et al 1981:147). These foundations have also been documented archaeologically at the Schermerhorn Row (Kardas and Larrabee 1978) and Telco sites (Rockman et al 1983). While they supported standing weight-bearing walls at 175 Water Street, spread-footing complexes did not underlie excavated stone yard walls on the block.

It has been noted that these foundations were always introduced beneath groundwater levels to protect them from decay (Stewart et al. 1981:47). Therefore, the placement of these constructions into 1780 levels on the 175 Water Street block implies that groundwater was encountered in fill dating from this time. This suggests that the occupation surfaces on the block would be found on later, dryer fills.

The fact that deposits above 1780 levels could be related to occupation surfaces and activities is also suggested by the dates from relatively high grey and orange deposits found throughout Lot 33, a lot located east of the wharf/grillage system. Trash strewn on the higher grey surface suggested a "living" floor to the excavators. The dates on these deposits were 1780 and 1790 for the lower orange soil (F28) and 1790 to 1857 for the higher grey deposit (F27) (see Dating and Function Based on Glass and Ceramics, Chapter 4). These two deposits again suggest occupation on this part of the block sometime after 1790, or after the block was established, and they corroborate the post-1780 development suggested by the dated levels of spread-footer complexes.

Based on these data and dates from ceramics and glass, an initial post-1790 or 1795 date appears applicable to the block development occurring east of the wharf/grillage. Post-1795 dates for occupation-related features from this part of the block corroborate this suggestion. It is conceivable, however, that earlier building construciton occurred on the western part of the block using the wharf/grillage as a stable foundation. This earlier development is suggested by a 1780 date for the privy built into the wharf/grillage (see Feature 50, Dating Based on Glass and Ceramics, Chapter 4), the earliest date from an excavated occupation feature. It is implied, then, that most, if not all earlier or pre-1790 block development would have occurred west of the 1981-1982 excavations on the 175 Water Street block. This is an hypothesis supported by the paucity of evidence for early occupation in the excavated fill.

It is possible that posts or pilings noted in Lots 19 and 33, and perhaps even shallow, horizontally planked bulkhead-type constructions excavated in Lots 19 and 22 (see Field Report, Chapter 3), were related to the block's early constructions or occupation. Perhaps structures were situated on the original Water Street, or on an early eastern definition of the block. These may have been "storehouses erected on piles" on "new made" land as described by Bayley (1799:14), or other wooden buildings that were ultimately replaced by the sturdier brick structures that stood on the block from 1842 to 1956/1960; but at present this early block development remains an unknown.

At this point, the occupation-related features discussed in Chapter 3 and analyzed in Chapters 4 and 6, pick up the archaeological story of the development of the 175 Water Street block. Of note here is the chronological variability of the fill process occurring on this block, the gaps that archaeological investigation has filled about this process, and the manifestations of the written and oral traditions of fill constructions as they are represented at this site.

COMPARISON OF RELEVANT LOCAL AND MEDIEVAL EUROPEAN FILL SITES

Manhattan's eighteenth-century fill sites are most validly compared with Medieval rather than contemporaneous European harbor sites. By the mid-eighteenth century, as noted previously in this chapter and in Chapter 2, a depletion of European timber, in addition to the strong tides encountered in most port sites, dictated that wood be only a minor component of these constructions. It is also suggested that by the early-nineteenth century,



Plate 5.6: Structural elements revealed in Lot 22, including a foundation beam (thin arrow), spread-footers (thick arrows), and log wharf/grillage. These elements were found in five contiguous yards on the Water Street side of the block.

fill techniques began to change in New York; hastily constructed timber and earth quays were noted in the late-1820s (Stevenson 1838:25-27; see Plate 5.1). Unlike the massive wooden wharf/grillage and the long-term filling documented archaeologically at 175 Water Street, the contiguous wooden pilings supporting rubble and earth deposits described in the first half of the nineteenth century were apparently more rapidly constructed and reflected a less intensive use of wood.

Table 5.4 compares the fill components found at local eighteenth-century New York fill sites with each other and with those found at a sample of Roman and Medieval harbor sites in Europe. Here it can be seen that garbage is the universal fill. But, while not all sites revealed all fill constructions, all fill constructions were found at more than one site. In addition, the similarity between local New York City and ancient European fill sites in the sample is evident. It should be noted, however, that the most detailed information used in this table comes from New York sites.

SUMMARY AND CONCLUSIONS

The primary, or original, fill on the 175 Water Street site is basically trash and harbor-related accumulation; this latter fill includes ship's ballast and possible dredge material, and among its major components are shells, wood chips, and leather. It is a fill found worldwide at harbor sites.

While varying in composition, the block fill is mainly brown to black to grey silts and sands. Analysis of ceramics and glass from these deposits indicates an ongoing fill process, structured by at least two engineering episodes, that appears to begin with naturally accruing harbor fill as early as 1740 or 1750, and ends sometime after 1780, but before 1795.

Fill constructions on the block were similar to those found at the other local mid- to late-eighteenth century fill sites, but here a massive timber wharf/grillage and a derelict ship used as cribbing were extensively exposed. It appears that the wharf/grillage system was the foundation for much of the Water Street, or western, side of the block. The "Ronson" ship and associated pilings and bulkhead apparently provided the cribbing to retain fill between this timber construction and the Front Street, or eastern, limit of the block. It is possible, however, that additional fill or harbor constructions are also part of the block system.

A post-1762 date for the wharf/grillage, as suggested by minimal artifactual evidence, seems unlikely since these once active wharves would logically predate the installation of the ship-cribbing. Map documentation indicates that the ship was in place by 1754 and artifactual evidence from the lower levels of the ship-fill appear compatable with this date.

Table 5.4 175 WATER STREET: Comparison of 18th C. New York Fill Sites and Selected Relevant Sites in Europe

Table 5.4a Eighteenth-Century New York City Fill Sites

Site and Date	Fill Deposits: Garbage Landfill	Fill Deposits: Ballast	Fill Deposits: Clean Sand or Earth	Primary Fill Constructions: "Cobb-Wharf" or Wharf/ Grillage	Primary Fill Constructions: Bulkhead	Primary Fill Constructions: Ship	Secondary Fill Constructions: "Cofferdam"/box
Old Slip[1] 18th C. (limited excavations)	x	-	x	x	-	-	-
Schermerhorn Row[2] 18th C. (limited excavations)	x	-	?	x	-	-	-
175 Water Street 18th C.	x	x	-	x	x	x	x
209 Water Street[3] 18th C. (limited excavations)	x	-	-	-	-	x	-
Telco[4] 18th C.	x	x	x	x	x	-	x

Table 5.4b A Sample of Medieval to Early Renaissance European Fill Sites

Trig (London)[5] 10th-15th C.	x	-	-	-	x	-	-
Dutch Sites (Holland)[6] Medieval-16th C.	x	?	?	x	x	x	?
Bryggen (Norway)[7] Medieval	x	?	?	x	x	?	?
Novograd (Soviet)[6] 10th-15th C.	x	?	?	x	x	?	?

[1] Huey 1969 [2] Kardas and Larrabee 1978 [3] Henn et al nd [4] Rockman et al 1983 [5] Milne and Milne 1978 [6] Baart et al 1977
[7] Baart et al 1977; Herteig 1959

An ongoing fill process, which is archaeologically documented, suggests that in the eighteenth century the eastern portion of the 175 Water Street block was one of many seaport fill sites that were collection areas for local garbage. Evidence for subsequent secondary fill constructions were found in the yards. These were built east of the wharf/grillage after 1790 or 1795 apparently to elevate fill depressions and eliminate breeding grounds for disease. Such an interpretation is possible for at least one large wooden cofferdam/box construction and perhaps for as many as four similar but smaller features. In addition, a pocket of ceramic discards suggests a similar fill maneuver. These secondary fill constructions were contemporaneous with several of the occupation-related features that are also documented east of the wharf/grillage system. The fill in a privy built into the wharf/grillage suggests that block development west of the earth-fill or along Water Street, may have begun by 1780.

The massive, weighted, raft-like timber constructions that comprise the wharf/grillage system on the block are particularly interesting for their graphic illustration of the "blocks" that are documented historically in the Minutes of the Common Council. They are also interesting in their documentation of the intensive use and availability of wood in the mid- eighteenth century. Moreover, a derelict ship in the landfill is again an illustration of an ancient fill technique.

The fill process found at 175 Water Street appears to represent not only block-specific eighteenth-century fill procedures, but also a continuation or readaptation of ancient European solutions to similar situations. Components of these fill maneuvers include an accessible and abundant wood supply, the debris of concentrated populations, and the impetus of developing commercialism and trade. The shore of the East River in lower Manhattan has apparently grown and developed on eighteenth-century foundations with traditions, techniques, and motivations rooted in antiquity.

CHAPTER 5: FOOTNOTES

1. I am also grateful to Dr. Joel Grossman for his comments and suggestions.

2. Roger Van den Bergh, of Chermayeff & Geismar Associates, kindly translated relevant sections of Opgravingen in Amsterdam from the Dutch.

3. Based on the recorded hold dimensions of an eighteenth-century English scow or bulk carrier (39 ft. 5 in. wide by 5 ft. deep [Cairo 1979:138]), a scow-load comprised approximately 3650 cubic feet of material, a capacity considered typical of scows from this time period (Brouwer 1982: personal communication).

4. Parenthetically, red and yellow bricks and large cobbles, apparently intended as weight to sink the ship, were found alongside the hull in the bottom levels of the deeptest (see Chapter 3, Deeptest 33). These materials may duplicate a fill situation documented in Amsterdam during 1972-1973 subway excavation where, in two of three excavations, boulders used to sink the vessels during Medieval fill maneuvers were found to have fallen overboard (Baart et al. 1977:62).

5. In addition to the cited sources, I am grateful to Brian Hobley, Chief Urban Archaeologist, the Museum of London, for information about London archaeology; I am equally indebted to Jan Baart of the Amsterdam Historical Museum, Amsterdam, for archaeological information about early land reclamation in Amsterdam.

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CHAPTER 6: SHIFTING ECONOMIC PATTERNS AND THE URBANIZATION OF THE 175 WATER STREET BLOCK

(Joan H. Geismar)

INTRODUCTION

Archaeological interpretation, like archaeology itself, is often stratified. The analytic focus can range from one level in a deposit, to a deposit composed of many levels, to the feature containing a series of deposits, and so on. Conversely, the entire complex site can be considered a simple artifact, the basic analytic unit (e.g., Salwen 1982). The focus of the analysis determines the form it will take.

The complexity of the research goals of the archaeological investigation of 175 Water Street required the incorporation of all these analytic elements. Analysis progressed from the artifact to the deposit; from the deposit to the feature; from the feature to the lot; from the lot to the block; and, finally, from the block as a site, to the block as a simple artifact of the city.

As discussed in the introduction to this report (Chapter 1), the research objectives of the archaeological investigation were multifold. They included both the documentation of the techniques, the traditions, and the chronology of the making of the block, which is presented in Chapter 5, and the block's urbanizing process, which will be discussed here.

Archaeologically documented shifts suggest the increasingly commmercial-urban aspect of this block. These shifts include changes from mixed domestic/commercial to mainly commercial occupations, from the merchant specialist/middleman to the warehouse distributor, and from water collection and sanitation by individuals to the piped-in water and sewage disposal supplied as a city service. These are factors that will be discussed in the following sections. Their documentation suggests a model of intensifying urbanization.

THE SITE AND ITS INTERPRETATIONS

The 175 Water Street site is defined by its block boundaries and is limited to its excavated lots. While archaeological investigation provided excellent research data, in fact, the block is only a component of the larger site, the city (see Dickens 1982). Its units of analysis comprised the features in ten excavated lot yards (out of a possible twenty-four), five lot sections that housed the Ronson ship, and four deeptests. Within these features and the ship, deposits were related either to late-eighteenth or nineteenth-century occupation of the block or to earlier land reclamation (see Chapter 5, Landfill).

The interpretations discussed here focus on the occupation-related levels of twenty-four features from the ten excavated yards. These deposits, mainly from ten privies and five cisterns, represent the datable activities of a lot's occupants. In order to trace the increasing commercialism and

specialization occurring on the block over time, these activities will be correlated with chronologies derived primarily from ceramic and glass analysis (Chapter 4). And, finally, where feasible, these data will be augmented by historic data to further decipher patterns of increasing urbanization.

One major research goal of archaeological interpretation of the 175 Water Street site became the correlation of artifactual data with an historical model that suggests changing patterns of distribution in American mercantile development.[1] Consequently, the model (Porter and Livesay 1971) and its application to the 175 Water Street data warrants at least brief discussion.

In its simplest terms, mercantile development in colonial America apparently began with the diversified colonial merchant, the procurer and seller of several kinds of goods in one establishment. Since occupation-related features from the site mainly post-date 1975 (see Feature Dating, Glass and Ceramics, Chapter 4 and Landfill, Chapter 5), evidence for this type of merchant activity would not necessarily be found in the site's deposits. According to the model, after 1815, the diversified merchant was replaced by or became the merchant-specialist, or middleman. After 1850, however, with the rise of the manufacturer-distributor, the warehouse, rather than the merchant, developed as the important distribution center.

Evidence for both the merchant specialist/middleman, and the change of bulk, warehouse-type distribution is suggested by the 175 Water Street data (see Glass and Ceramics Analyses, Chapter 4, and below). Moreover, as shall be seen, this archaeologically documented change in patterns of distribution predates the time-frame for these changes outlined in the model. The apparently premature occurrence of these shifts in New York City, a center of trade, is not unexpected (Porter 1982: personal communication), but the time of the transitions raises questions; among them is that of the cause and effect in the rise of the national dominance of the New York port (see Albion 1939). However, such questions are beyound the scope of the current analysis.

The commercial aspect of the site is documented historically. The Water Street side of the block initially housed buildings with commercial establishments on the ground or lower floors and domestic quarters above (see History, Chapter 2). Over time, however, these domestic components ultimately gave way to mainly commercial activities. In addition, it appears that the block's Front Street development may have been mostly commercial almost from its inception (see Lot Histories, Chapter 2). Archaeological evidence from selected features suggests that sometime between 1795 and 1830 commercial activities on the block became dominant (see below), a shift that appears consistent with the information from historical research.

DEVELOPING COMMERCIALISM OF THE 175 WATER STREET BLOCK

The Shift to Commercial Activities

Indications of shifts in merchant activity on the block come from an archaeologically documented trend toward a concentration of primary commercial deposits. From identified and dated features, it appears that a shift from mainly domestic to mainly commercial deposits occurred sometime between 1795 and 1830.

It has been explained in the Glass and Ceramic analyses (Chapter 4) that a "primary" deposit comprises the mendable nearly whole vessels discarded by a lot's occupants as opposed to the fragmented, mixed sherds from fill. These were important criteria in determining whether a deposit represented long term occupation activities or merely quick fill operations undertaken when features were no longer in use. Many rapid fill maneuvers using a redeposited fill were apparently employed to eliminate the dangerous nuisance an empty, deep feature might create; or, they might precede subsequent lot alterations.

During laboratory analyses, it became obvious that a large deposit of mendable ceramics from a feature in Lot 22 (F41)--comprising plates, cups, and bowls of various sizes and patterns, often in numbers suggesting "sets" --could not be cast-offs from household breakage. Instead, they suggested a commercial activity. This assessment was reinforced when it also became apparent that these ceramics, as well as glass tableware in the deposit, displayed little if any evidence of wear. This includes the scratches and debasing that occurs on the bottom of household vessels with daily or repeated use.

Ongoing historical research independently indicated that the Feature 41 deposit could be associated with at least one of three china and glass "stores" located on the lot from 1789 to 1808, and again from 1816 to 1826. Several similar deposits and correlations indicated that wear patterns were valid criteria for distinguishing between commercial and domestic deposits.

In order to further distinguish between these deposits, selected artifactual material was tested with two analyses. The first, an adaptation of a model devised to recognize patterning of eighteenth-century British-colonial domestic sites in the Carolinas (South 1977:83-139), was used to compare selected 175 Water Street deposits with those from the Carolina sites and with each other. The second, a computer-run discriminant analysis, (Dixon and Brown 1981), determined the statistical differences between selected artifact variables and allowed group classification based on these differences (e.g., Thomas 1978; Geismar 1982:172-175).

Artifact Patterning

The Carolina Artifact Pattern model is predicated on the uniformity of goods available in a colonial system and on the homogeneity of the behavioral molds of its participants (South 1977:86). Since the 175 Water Street site represents post-colonial development, and therefore functioned within a more diverse system than the Carolina sites, the applicability of this model was at first questionable. In addition to the availability of varied goods, the block's occupants were of a mixed cultural background, minimally Dutch and British. Furthermore, the analysis was anticipated to be complicated by the commercial/domestic mix of the lot occupations, the mixed-fill found throughout these features, and the made-land base of the block. In fact, however, comparison of selected feature deposits with the Carolina data proved rewarding.

The data base of the analysis is mainly those artifacts considered "Small Finds" (see Chapter 4) augmented by ceramics, glass, and construction material. Complying with South's categories, but allowing for the variation of a later, more diverse data base, selected artifacts, counted as fragments, were organized into six categories. These included a Kitchen group (ceramics, alcoholic and non-alcoholic beverage bottles, food bottles, glass tableware, proprietary medicine bottles, and miscellaneous kitchenware); an Architectural group (nails, construction hardware and fragmented, construction-related metal, and window/sheet glass); a Furniture group (furniture hardware);an Arms group (gunflints, gunspalls, and musketballs); a Personal group (clothing, buttons, beads, fabrics, jewelry, keys, pins, thimbles, coins, and buckles. It should be noted that the "sewing" group in the small finds category was added to this group.); and finally, an Activity group (wood objects--worked, identifiable, and fragmentary--tools, clay pipes, button blanks, lead seals, candle snuffers, toys, fishing gear, and miscellaneous hardware). Modification of South's categories include the classification of all smoking pipes as an activity item, rather than ball clay pipes treated as a separate class, and exclusion of ethnobotanical material from the sample. In addition, wine bottles are assumed under the larger category of alcoholic beverages since a greater variety of bottled alcoholic beverages was found in the nineteenth century than in the eighteeenth.

Four features were selected for the Carolina Artifact Pattern analysis; each represents a specific deposit-type found on the site. Feature 41 is the china and glass store privy, an early commerical deposit; Feature 2, also a privy, represents another kind of commercial deposit, apparently a later warehouse (see Glass Analysis, Chapter 4, and below); Feature 49, a box/cofferdam, is a domestic deposit (see Landfill; Chapter 5); and Feature 3, a cistern, is a mixed, redeposited fill.

The artifact numbers and percentages for each group are found in Table 6.1; their comparison with the Carolina model sites is shown in Table 6.2. Here it can be seen that both the domestic and redeposited fill deposits (Features 49 and 3, respectively) comply with the Carolina pattern for domestic sites (see South 1977: 103, Table 5). Only the Arms group, a minor component in the five model sites (less than 0.5% in all cases), is entirely missing from both assemblages while the Activity group is slightly higher in

Table 6.1 175 WATER STREET: Carolina Artifact Patterning Analysis with Variation*-6 Groups

Feat. Number	Feat. Type	Levels	Arms	General Activity	Kitchen	Furniture	Personal	Architectural	Totals
			# %	# %	# %	# %	# %	# %	# %
41	early comm.	1,2	4(0.0)	270(2.1)	11643(88.9)	9(0.1)	69(0.5)	1109(8.5)	13104(100.1)
49	dom.	1,2,3	-	137(3.1)	2717(62.0)	-	26(0.5)	1505(34.3)	4385(99.9)
2	late comm.	1,2	2(0.0)	134(3.2)	1894(45.8)	1(0.0)	16(0.4)	2091(50.5)	4138(99.9)
3	redep. fill	1,2	-	110(5.1)	1342(62.1)	1(0.0)	8(0.4)	701(32.4)	2162(100.0)

* after South (1977)

Table 6.2 175 WATER STREET: Comparison of Selected Features to Carolina Sites*

Group	175 Water Street Feature			
	F41 (comm.--privy)	F2 (comm.--privy)	F49 (dom.--box/ cofferdam)	F3 (redep. fill-- cistern)
Kitchen	+	-	✓	✓
Architectural	-	+	✓	✓
Furniture	✓	✓	✓	✓
Arms	-	-	-	-
Personal	✓	✓	✓	✓
General Activity	✓	✓	✓	x

+ = high
- = low
✓ = same range
x = slightly higher percentage
*compared with South 1977:103

Feature 3. The agreement of the domestic deposit with the model is telling, as is the virtually similar makeup of the redeposited fill in Feature 3. This analysis tends to confirm the domestic nature of this fill, apparently comprising a basic matrix of household trash.

Four of the six groups--Furniture, Arms, Personal, and Activity--from the two commerical features, Features 41 and 2, concur with the model for domestic sites. It is the Kitchen group that shows the greatest variation, followed by the Architectural group.

The Kitchen group, which includes all ceramic and glass tableware fragments from each feature, rises above the domestic range of 51.8% to 64.6% in the model sites to 88.9% in Feature 41. Here, too, the Architectural group drops to half (at 8.5%) of the lowest percentage in the model sites (16.2%). The inflation of the Kitchen group in Feature 41 is not surprising since, as described previously, it undoubtedly represents breakage from a china and glass store or stores. This deposit produced the second highest glass and ceramic sherd assemblages from the site, exceeded only by a deposit (F34) from yet another china and glass store (see Glass Table 4.5 and Ceramic Table 4.11). The high percentage of the Kitchen category in this feature appears to go beyond the domestic situation to indicate a specialized commercial activity. Conversely, the relatively low percentage of the Kitchen group in Feature 2, a privy in Lot 33, appears to document the later commercial warehouse situation suggested by glass analysis (see Chapter 4 and below).

The low representation of the Architectural group in Feature 41 is at present unexplained. The relatively high percentage of this group found in Feature 2 may result from the function of the building as a warehouse or, perhaps more realistically, from the fact that it was used and filled at a time when window glass and nails--both major components of this category--were relatively common (see Feature Dating, Glass and Ceramic Table 4.17, Chapter 4).

As noted previously, and as can be seen in the small sample presented here, this artifact pattern analysis tends to support assessments of function made for the domestic and commercial features in the sample based on wear patterns, and to confirm the domestic-trash nature of redeposited fill. In addition, with minor adaptations to extend its applicability to a later data base, the results support the value of South's model for testing patterns of function at complex American urban sites with occupations extending into the nineteenth century.

Discriminant Analysis[2]

In an attempt to further distinguish between domestic and commercial feature components, a stepwise discriminant analysis (BMDP7M) was run on five selected independent variables from twenty-five occupation features (Dixon and Brown 1981). The variables, selected for their projected ability to statistically distinguish between the two feature types, included 1) minimum number of ceramic vessels, 2) minimum number of bottles, glass tableware, and proof vials (one variable), 3) selected edible fauna, 4) selected edible flora, and 5) leather shoes, shoe parts, and scraps.[3] It was anticipated

that the mendable or nearly whole ceramic and glass vessels found in primary domestic and commercial deposits would distinguish deposit types when compared with models of classification and that the remaining variables, all counted in fragments, would represent the fill matrix of the features.

It should be noted that wear patterns on the ceramics and glass, the major determinator for distinguishing between primary domestic and commercial deposits in the lab, was not a factor in this analysis. As shall be seen, this attempt to keep the test variables independent of data used to classify the model features undoubtedly limited the test's ability to discriminate.

Four of twenty-five features in the analysis were chosen as criteria for distinguishing between commercial and domestic deposits. Features 41 and 34, the former is a china and glass store privy, the latter apparently another china and glass store ceramic concentration from a pit-like feature, were chosen as models for commercial components. A level in Feature 43, also a privy deposit, and all of Feature 49, a box/cofferdam, both considered domestic deposits, served as models for this type deposit.

The discriminant analysis confirmed the difference between the model deposits. Moreover, a strong confirmation was made using only two of the five variables, ceramics and fauna. What this test determined was that the two preassigned commercial deposits were statistically similar to each other as well as being statistically different from the other deposits in the sample (see Table 6.3 and Figure 6.1). Taking this a step further, this analysis suggests that these features represent a ceramic-oriented commercial activity. In addition, it indicates that other deposits in the sample were not the result of similar activities. And, finally, it also suggests that a domestic-trash base was present throughout the features not statistically overwhelmed by a ceramic inventory from a china store.

As organized, the analysis determines that only the china-store components are commercial. A reorganization of variables, including the incorporation of a wear-pattern variable, and alternate models of classification, would undoubtedly discriminate further, picking up other commercial components. But this remains for future analysis.

Additional Archaeological Indicators of a Domestic/Commercial Shift

Whiteware, the most common ceramic from domestic deposits dating from the mid-nineteenth century, was found to be totally lacking or a negligible part of the site's ceramic samples. The absence of this ceramic in occupation-related deposits postdating 1840 suggests the commercial, or non-household, aspect of these later deposits. The fact that it is also not found in the domestic, redeposited fill in these features attests to the earlier date of their fill matrix. Only in the upper level of Feature 1, a cistern in Lot 36, filled after 1864, was a small quantity of this ware type recovered (see Ceramic Table 4.9, Chapter 4). Other late deposits, such as the fill from the privy in Lot 33 (F2) dated between 1842 and 1900, produced none of these ceramics. This corroborates evidence from wear patterns on bottles, and from the bottle types, that suggests this was a commercial rather than a domestic deposit (see Glass, Chapter 4 and below).

Table 6.3 175 WATER STREET: Feature Assignments and Scores on the Discriminant Function*

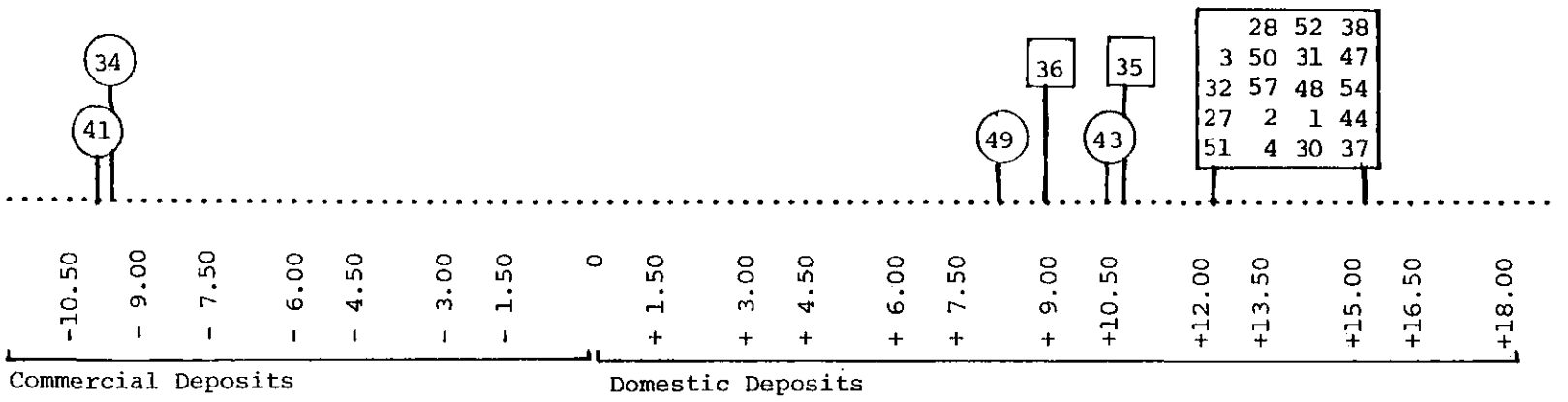
Feature Number	Group Assignment Prior to Discriminant Analysis	Group Assignment Based on Discriminant Analysis	Feature Scores on the Discriminant Function
1	u	d	+ 14.50
2	u	d	+ 13.65
3	u	d	+ 13.54
4	u	d	+ 13.64
27	u	d	+ 12.97
28	u	d	+ 13.96
30	u	d	+ 14.45
31	u	d	+ 14.90
32	u	d	+ 13.08
34	c	c	- 9.59
35	u	d	+ 11.25
36	u	d	+ 9.42
37	u	d	+ 15.68
38	u	d	+ 15.95
41	c	c	- 9.17
43**	d	d	+ 10.36
44	u	d	+ 15.74
47	u	d	+ 15.93
48	u	d	+ 14.66
49	d	d	+ 8.40
50	u	d	+ 13.77
51	u	d	+ 12.86
52	u	d	+ 15.57
54	u	d	+ 15.79
57	u	d	+ 13.75

N cases=25

d = domestic deposit c = commercial deposit u = unclassified deposit
*see Dixon and Brown 1981
**only level 2 of Feature 43 is considered in this analysis

Figure 6.1
175 WATER STREET

Interpretations
Feature Scores on the Discriminate Function*



◯ = preassigned and confirmed □ = assigned by computer analysis ..... = discriminant function

(numbers within ◯ and □ indicate feature number)

*based on Table 6.3

The Shift from Domestic/Commercial to Commercial Deposits

Once deposit types were identified, the archaeological evidence for a shift from mainly domestic or domestic/commercial deposits to commercial deposits could be determined; the results are illustrated in Tables 6.4 and 6.5. The data indicate that 66.7% of the deposits in the analysis are primary domestic and 33.3% are primary commercial prior to 1830; after this date, domestic deposits drop to 25.0% while commercial deposits rise to 75.0% (Table 6.5). Admittedly based on a small sample (a total of 13 firmly dated primary deposits), the shift in deposit-types appears to imply the increasingly commercial aspect of the 175 Water Street block. It is a shift that obviously contributed to, or was caused by, the urbanization of the area.

FROM SPECIALIST/MIDDLEMAN TO WAREHOUSE DISTRIBUTION ON THE 175 WATER STREET BLOCK

Perhaps because of the ephemeral nature of unspecialized merchant activities, or perhaps because of the post-Revolutionary time frame for the lot features, deposits that might archaeologically document the early colonial all-purpose merchant are not necessarily identifiable or located on the block. But archaeological data from 175 Water Street do suggest the specialist/middleman and then, at a later date, the distributing warehouse. The evidence for a specialist/middleman--perhaps a retailer and wholesaler--in Feature 41 in Lot 22, and for bulk storage and wholesale distribution in Feature 2 in Lot 33, will be discussed here.

The Specialist/Middleman

The privy deposit from the china and glass store, or stores, (F41) apparently represents an example of the archaeological manifestation of the specialist/middlemen. Moreover, as noted previously, this commercial component appears to predate the time frame of the historic model. In this section, it will be shown how this stage of distribution is implied archeologically as well as historically.

While the term "store" suggests a retail establishment, the nineteenth-century definition also conveys the meaning of storehouse, a "place where stores are kept" (Murray 1919; see History, Chapter 2). Therefore, both retail and warehouse activities may be implied for the china, or china and glass stores listed in the New York Directories from 1789 and 1808, and again from 1816 to 1826, at 173 Water Street (Lot 22) (see Lot Histories, Chapter 2).

It is conceivable that the broken ceramics in the privy in Lot 22 were discards from all the stores docmented on the lot. However, the ceramic terminus post quem date of 1795 for the occupation-related deposits (see Ceramics, Chapter 2), and the range of manufacture dates, tends to suggest that these deposits are best associated with the china and glass store of William N. Kettletas. The store's specialization is obvious from artifactual evidence, but a warehouse-type activity is also suggested. Consequently, historical inference for this latter possibility is presented here.

Table 6.4 175 WATER STREET: Identification and Dates of Primary Feature Deposit Types Based on Glass and Ceramic Wear Patterns*

Lot Number	Feature Number	Feat. Iden.	Primary Domestic	Primary Commercial	Domestic in Redep. Fill	Commercial in Redep. Fill	Redep. Fill	Date Range	Comments
36	1	cistern		✓				1830-1900	
33	2	privy		✓				1842-1900	
	3	cistern					✓	1780-1857	
	4	cistern	?	?				1833-1869	
32	30	box			?			1795-1820	
30	31	barrel			✓			post 1790	
23	32	privy		✓				1860-1880	
	34	"pit"		✓				1795-1830	
	35	box					✓	post 1795	
	36	box	?	?				c. 1809	
	37	barrel				✓		c. 1809	
	38	cistern†					✓	1795-1830	
22	41	privy		✓				1800-1808	
21	42	privy					✓	1857-1865	
	43	privy	✓**				✓	1795-1865	
	44	privy					✓	1786-1857	
20	47	privy			✓			c. 1867	latest domestic deposit
	48	privy					✓	1799-1830	
	49	box/cofferdam	✓					1795-1820	
19	50	privy			✓			1780-1830	earliest privy deposit
18	51	privy			✓			1790-1820	
	52	box					✓	1780-1830	
	54	cistern†					✓	post 1795	
33	57	barrel	✓					1790-1830	
Total	24 Features								

* see Glass and Ceramic Table 4.1

† cistern bases only

**level 2, dated from 1795-1820, is a primary domestic deposit; level 1 is redeposited fill.

Table 6.5 176 WATER STREET: Number and Percent of Domestic and Commercial Deposits Pre- and Post-1830 (Based on firmly dated deposits presented in Table 6.4)

Date Range	Domestic		Commercial	
	#	%	#	%
1780-1830	6	(66.7)	3	(33.3)
1830-1900	1	(25.0)	3	(75.0)

William N. Kettletas the china and glass merchant located on the lot from 1800 to 1808, was the son of a Gerret (Garret) Kettletas, also a china merchant, and probably the great-grandson of another merchant, Captain Abraham Kettletas (Kettletas 1743). Although the Lot 22 china and glass store is listed in the Directories under the name of William N. Kettletas, his father, who owned this and, briefly, the property next door occupied by Kettletas & Son in 1809, was apparently part of this venture. The scope and arrangement of the business--in 1804 including offices as well as a store on the Lot 22 property and other store locations--implies a middleman function. So does the apparent collapse of this operation by or just after 1809, a demise that coincides with the imposition of Jeffersonian embargoes on imported goods (see History, Chapter 2).

Prior to occupying the 173 Water Street store, William N. Kettletas had lived in Liverpool, England, an eighteenth and nineteenth-century center of ceramic manufacture and export. In 1795, while a resident of Liverpool parrish, he married and remained in the city for at least two years (Little 1897:172-173). It is possible that he was the factor or buyer for his father, who at the time had unspecified mercantile establishments at various New York City locations (New York Directories).

The fact that William N. Kettletas was personally acquainted with Liverpool and, one assumes, its manufacturers, again suggests his possible link to the late-eighteenth and early-nineteenth-century wholesale ceramic trade. Certainly the family was familiar with relatively large scale trade and wholesaling. His merchant great-grandfather's will documents ownership of two "storehouses" in New York City by 1743 (Kettletas 1743), and his cousin, also William Kettletas, although a lawyer by training and practice, was for a time involved in an unspecified "wholesale field" (Livingston Papers 1812).

Based on this information, while William N. Kettletas could have been solely a retail china and glass merchant, it seems likely that he was also a wholesaler or jobber, a natural development from his colonial merchant roots (Porter and Livesay 1971:3). If this is so, although the country of origin for all the ceramics and glass in the deposit cannot be identified absolutely, Kettletas appears mainly to have been a purveyor of the English ceramics commonly distributed in America during the early-nineteenth century (see The Miller Model, Ceramics Analysis, Chapter 4).

It has been suggested that the 249 ceramic vessels identified from the primary deposits of the occupation levels of the privy in Lot 22 may represent breakage from only one or two shipments (see The Miller Model, Ceramics Analysis, Chapter 4). However, the range of manufacture dates for these vessels implies more than one or two deposits. The profusion of unused, discarded ceramics and glass suggests goods broken either during shipment or while on display for sale to individuals, retailers, or both. Certainly William N. Kettletas, who occupied Lot 22 from 1800 to 1808, was a merchant specializing in ceramics and glass. It is also likely from the archaeologically documented inventory, from his connections, from the scope of the business, and from his background that he was at this early date a middleman-distributor; this "urban wholesaler" (Porter and Livesay 1971:3) was an important component of the nineteenth-century American Mercantile System.

Increasing Commercialism and the Evidence for Warehouse Distribution

The deposits from Feature 2, a privy in Lot 33 dated between 1842 and 1900, suggest several aspects of the block's commercial development. Among them are the documentation of mid-nineteenth-century commercial components and, more speculatively, the shift from the merchant middleman/specialist to the distributing warehouse.

While the primary artifactual data from the feature--mainly an assortment of whole or nearly whole bottles with some evidence of wear--might suggest a domestic deposit, distribution of bottle types appears to negate this assessment (see Bottle Analysis, Chapter 4). Also, as noted previously, the lack of whiteware in the deposits suggests a commercial component.

In order to confirm the commercial classification indicated in the pattern analysis (see above) and to identify the non-domestic aspect of the bottles, a comparison was made between bottle types from a deposit in this feature, dated from 1842 to 1865, and a chronologically compatible domestic deposit (Feature 47 in Lot 20 dated from 1867).

As can be seen in Table 6.6, the bottle assemblage from the selected level in Feature 2 is different from that in the domestic feature. A somewhat greater diversity of bottle types is present in the commercial feature, including master inks, perfumes, and vials, but more importantly, the percentage of bottles types is very different. While food dominates the domestic deposit (61.9%), an almost equivalent percentage of various alcoholic beverages (63.9%) dominates the commercial deposit.[4] Given the wear patterns and percentages of bottle types, it is likely that the bottles from Feature 2 are not the product of trade, but of worker consumption (see Geismar 1980; see also Lender and Martin 1982).

In contrast to the profusion of ceramics from Feature 41, the artifacts from Feature 2 provide no clue to identify the product being sold or manufactured; there is no hint of the merchandise or the specialty, if any, of the lot's merchant occupants. This was identified as a warehouse situation by the glass analyst (see Glass, Chapter 4). Here, negative evidence, albeit speculative, suggests a shift from the merchant middleman/specialist to the distributing warehouse.

Historically, merchants occupied this lot beginning in 1794. By 1798, it appears to have been a merchant warehouse, and then, interchangably, unspecified shops and "stores" are documented in the tax records (see History Section and Lot Histories, Chapter 2). However, based on lack of evidence for a product, Feature 2 in this lot appears to represent a commercial activity where storage and bulk distribution rather than active sales occurred.

According to the model, after 1850, and perhaps as late as 1870, the products and marketing techniques resulting from new technologies--including changes in transportation--began to make the function of the independent middleman obsolete. As goods became abundant, attempts were made to control marketing through storage and distribution.

Table 6.6 175 WATER STREET: Comparison of Identified Bottles from Occupation Levels of a Commercial Deposit (Feature 2, Levels 1,2) and a Domestic Deposit (Feature 47, Levels 1,2,3)--Dated Mid- to Late 19th C.

	Master Ink (KA01)		Medicine (KA05, 06, 62)		Alcoholic (KA08, 10, 12, 14, 20,35,45)		Food (KA37,38, 39,51, 61,63)		Perfume (KA31)		Vial (KA07)		Totals	
Feature	#	%	#	%	#	%	#	%	#	%	#	%	#	%
F2(all)*	4	(0.3)	323	(27.0)	708	(59.2)	144	(12.0)	6	(0.5)	11	(0.9)	1196	(99.9)
F47(all)	-		2	(2.4)	30	(35.7)	52	(61.9)	-		-		84	(100.0)

*F2.2 (1842-1865) is chronologically comparable to F47 (1867) and is therefore presented here. The differences between deposits is even more strongly indicated:

F2.2	-		251	(26.8)	588	(62.8)	86	(9.2)	2	(0.2)	-		936	(100.0)

Sometimes the middleman took on the role of the holding establishment, but more often he was replaced by the manufacturer/distributor (Porter and Livesay 1971:10). In the Lot 33 situation, this distributor may have been a wholesale grocer or importer of luxury comestibles (Harrington 1935:61), rather than a manufacturer (see History, Chapter 2); however, no evidence of the retail aspect of this trade was found in Feature 2. This is admittedly unexpected since tax records indicate shops on the lot in the mid-nineteenth century. Yet, floral and glass evidence for some of the items handled by a grocer are found in a box-feature (F30) and its surrounding fill in an adjacent lot. Therefore, it is suggested that storage and a solely wholesale operation is documented in this privy in Lot 33.

This implies that factors other than the type of goods being sold account for the lack of evidence for a product in Feature 2. As was the case with the specialist/middleman, this next phase of mercantile development implied for the block, the warehouse/distributor, is suggested at a somewhat earlier date than is set forth in the historic model. It is a suggestion that attests to the developing commercialism of the block and its continuing commercial-urbanization. Taking this a step further, the artifactual evidence for increasing commercialism, particularly the non-retail warehouse situation, implies the urban phenomenon of separation of residential and commercial neighborhoods and an evolving Central Market District (see History, Chapter 2). While the data here are lot and block specific, their implication goes beyond these considerations to archaeological manifestations of American urbanization in the nineteenth century.

THE EXTENSION OF PUBLIC SERVICES RELATED TO THE SITE DATA

The disuse and filling of the block's cisterns and privies archaeologically document the availability and adoption of city services in the form of running water and sewers. This in turn suggests technological and administrative sophistication, as has been noted by Dickens and Crimmins (1982:108), and, by implication, urbanization. Unlike mercantile development, which apparently predates the historic model (see above), the site's archaeological data for adoption of selected city services lags behind documented accessibility.

The history of New York City's water supply system and block-specific data are presented in Chapter 2 (see Extension of Public Services). It is a history that documents the availability of piped-in water perhaps as early as 1806, but certainly by 1820; it also implies that sewage disposal should have been available between 1850 and 1855. Since the earliest available water supply was both an expense ($8.00 annually per household plus an installation charge) and of questionable quality, it is not surprising that archaeological data suggest the continuing use of cisterns after 1820. This assessment is based on the dated fill from these features (Table 6.7).

Many of the fills found in the cisterns and privies are somewhat comparable in composition but not in dates to the original landfill used to make the block. This is the trash-based, fragmented, redeposited fill for which only a terminus post quem, the earliest manufacture date of the latest artifact, is extractable. Because they were recycled, these deposits suggest earlier dates than the actual time the features were filled.

Table 6.7 175 WATER STREET: Comparison of Fill Dates for Cisterns and Privies Based on Primary and Redeposited Fill Deposits

Lot Number	Feature Number	Feature Levels	Primary Domestic	Primary Commercial	Domestic in Redep. Fill	Commercial in Redep. Fill	Redep. Fill	Unidentified Primary	Date Range
Table 6.7a Cisterns and Privies with Redeposited Fill									
Cisterns (3)									
									1780-1857
33	3	1,2					✓		1780-1857
23	38	1					✓		1795-1830
18	54	1					✓		post 1795
Privies (4)									
21	42	1,2					✓		1857-1865
	43	1*					✓		→ 1865
	44	1					✓		1786-1857
20	48	1,2					✓		1799-1830
Table 6.7b Cisterns and Privies with Primary Deposits									
Cisterns (2)									
36	1	1							1864-1900
		2				✓			1830-1864
33	4	1,2,3						✓	1833-1869
Privies (7)									
33	2	1				✓			1865-1900
		2							1842-1865
23	32	1,2,3,4				✓			1860-1880
22	41	1		✓					1800-1808+
21	43*	2	✓						1795-1820
20	47	1			✓				c. 1867
19	50	1			✓				1780-1830
18	51	1			✓				1790-1820

Note: _____ indicates probable fill date if strongly indicated.

*this privy, F43, had an early primary domestic deposit underlying later redeposited fill

None of the firm dates for these redeposited privy and cistern fills suggests abandonment prior to 1830, and most suggest filling after 1857 (see Table 6.7a: F3, F42, one level of F43, and F44). One of these features (F44) was apparently used until after 1865. These data are consistent with those from primary, or occupation-related, deposits (Table 6.7b). However, with few exceptions, these slowly accruing primary deposits suggest a somewhat later time frame for feature disuse. The exceptions (F41, F50, and F51)--all of which exhibit early or incomplete dates--perhaps can be explained by factors other than adoption of city services.

For example, Feature 50, a privy in Lot 19 with a suggested fill date of approximatley 1830, was cut into the wharf/grillage timbers that comprised an engineered fill episode on the Water Street side of the block (see Landfill, Chapter 5). Apparently the earliest occupation-related feature excavated, it was subsequently covered by a warehouse built in 1842 to replace a building destroyed in the December, 1835, fire (see Plate 1.2). This new building, or subsequent basement construction, covered the privy feature, sealing its primary domestic deposit dated from 1780 to approximately 1830. Feature 41, the privy in Lot 22 filled with early-nineteenth-century china and glass, is also associated with a building that apparently burned. Only the dates for Feature 51, a domestic privy in Lot 18 with a fill range of 1790 to 1820, appear too early to be explained by construction after fires in the 1830s and 1840s. This lot too was affected by fire, but the privy dates may reflect the feature's abandoment prior to fire destruction. It is conceivable that a partially excavated, unidentified stone feature (F53) containing redeposited fill, and one primary artifact dated from 1865 to 1890, may be this lot's substitute privy (see Glass and Ceramic Feature Dating, Table 4.17), but this is speculative at present.

Other excavated primary cistern and privy deposits all seem to suggest 1860 to 1900 fill dates. It appears that although city water and sewage disposal were theoretically available beteen 1842 and 1855, the block's occupants continued to use their individual lot facilities until at least the mid-1860s. In the case of privies, it appears to have continued even longer. This suggests the unavailability or the inefficiency of mid-nineteenth century city services, or a reluctance to use them. Perhaps an installation fee and a $10 annual water rent (1981:120) were factors keeping water collection and sanitation up to individuals.

At a time related to the fill dates for the site's cisterns and privies, a waste-related drain (F45) within Feature 44, loosely dated between 1850 and 1960, suggests the feature's continuing use as a cesspool after privy features were generally abandoned. Other variously shaped brick or stone non-privy related drains located on several lots (lots 19, 20, 21, and 23) may have been used to channel water from roof runoffs after cisterns were no longer in use. A brick feature in Lot 30, acting as an overflow drain for a standing cistern, confirmed a drain function for these features. This was a function also suggested for a similar mid-nineteenth century feature excavated on the Stadt Huys block, a site located several blocks south of 175 Water Street (Rockman 1982:personal communication). These features, located beyond the outside walls of buildings, would have been installed once the use of city services replaced the need for collecting water from roof run-off in lot cisterns. These features were often covered by subsequent building extensions or by flagstone paving.

The mid- to late-nineteenth-century dates for adoption of city services do not necessarily reflect technological problems as much as administrative and practical difficulties associated with large, complex cities. The appropriate technology for these services has been documented in the past. The Romans had built aqueducts throughout Europe to bring pure water to their outpost cities, and pipes, valves, and faucets were produced in early times. Moreover, cast iron pipes, the mainstay of large sewage disposal systems, were in use, if not completely perfected, from the late-eighteenth to early-nineteenth centuries in France (Daumas 1979:455). Even the principle of the flush toilet has been known since at least 1596 (Daumas 1979:460). Incorporating all these technologies into a cohesive system was apparently the stumbling block to their nineteenth-century adaptation to city life.

However, prompted by cholera epidemics (Spann 1981:133-134), the technological and administrative wherewithal to make water available and sewage disposal operative were finally coordinated in New York City between 1842 and 1855. Yet, as late as 1848, water for home consumption was still unavailable to two-thirds of New York, and by 1859 three-fourths of the city's paved streets were still without sewers (Spann 1981:133-134). Moreover, the sewer system available in 1866 was in effect nothing more than one long cesspool emptying into the East River, causing pollution and contamination (Spann 1981:133-134).

Installation of city services in the form of water and sewage disposal was apparently particularly slow in the site area. In addition to the late dates associated with the fill in the block's excavated cisterns and privies, standing hotel structures on the Schermerhorn Row block, just northeast of 175 Water Street, document the use of commodes on hotel floors well after 1850, and the first running water for hotel guests, a communal sink, was installed as late as 1878 (Stewart et al. 1981:114).

The historic documentation indicates an inadequate approach in the nineteenth century to the urban problem of waste disposal for growing populations. Moreover, the block data suggest that available water and sewage services did not alter existing facilities until sometime after 1865. The archaeological evidence implies that although mercantile development on the block apparently proceeded in advance of the historic model--a development that suggests rapidly increasing urbanization--water collection and sanitation based on established methods continued for a protracted time period. While the city's uptown elite may have enjoyed an updated sanitation system (Spann 1981:118), public utilities represented by water and sewage facilities were slow to spread to, or be adopted into, the city's non-residential commercial hub. It is possible that evidence for the late availability of city services may actually be a characteristic of commercially urbanizing areas of a city. This is a facet of urbanization to be investigated further.

SUMMARY

The tests, the techniques, and the assessments presented in this chapter suggest a model for determining the increasingly commercial aspect of a nineteenth-century urban seaport block. Levels of analysis proceeded from the glass or ceramic sherd to the site as an artifact of the city.

Test models were drawn from history; analytic techniques included wear pattern analysis on artifacts and pattern and statistical analysis of features. The results suggested the means to distinguish between commercial and domestic deposits. They also indicated the deposits that represent the specialist/middleman and those that suggest the warehouse/distributor. In addition, analysis focused on the urbanization of a commercial area as it is reflected in the availability and adoption of selected city services.

The mercantile development of the 175 Water Street block apparently predates the historic model, while the adoption of city services postdates theoretical availability of these services as represented by running water and sewage disposal. All these factors suggest an archaeological model for determining commercial urbanization within the framework of a relevant nineteenth century American site. It remains to test and refine this model with data from other similar archaeological sites.

CHAPTER 6: FOOTNOTES

[1] Thanks go to David Mente, William Shopsin, and James Shenton for their suggestions and good advice regarding the Porter-Livesay model; my thanks to Glenn Porter, also, for his enthusiasm and interest.

[2] I am grateful to Mitchell Mulholland, DMS Computer Consulting service, and Andrew Petto, Department of Anthropology, University of Massachusetts, for their expertise in running and analyzing the discriminant analysis for this study.

[3] This same analysis was run on a finer breakdown of these variables with the same results.

[4] See Empire Stores bottle analysis (Geismar 1980) for comparison with another commercial mid- to late-nineteenth century site. Here, the bottle assemblage from construction workers contained a considerably higher percentage of mineral and soda water bottles than alcoholic beverages. Given the time frame for the Feature 2 deposit, it is surprising that no mineral or soda water bottles were recovered.

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CHAPTER 7: THE RONSON SHIP
(Warren Riess and Sheli O. Smith)

INTRODUCTION

As noted in Chapter 3, during the course of field investigation, four deeptest trenches 10 ft. x 30 in. were excavated; on January 6, 1982, during excavation of the fourth trench, on the block's eastern side (lot 33), excavators encountered a solid wall of horizontal wooden planks (Geismar and Nicklas 1982:20) (Figure 7.1). Dr. Geismar initially identified the wood as cribbing or a bulkhead structure, but this interpretation changed when the excavators found the planks curved eastward away from the deep trench. At this time George Myers, one of the excavators of the trench, raised the possibility that the planks were part of a ship. By mid-January, historian Norman Brouwer and nautical archaeologist Warren Riess identified the exposed planks as the outer sheathing (firring) commonly found on seventeenth and eighteenth-century ships; they felt that the remains were part of an eighteenth-century merchantman.

Excited by the integrity of the exposed hull and the degree of preservation, the Soil Systems team, with Bert Herbert and George Myers working under Warren Riess's direction, prepared plans to dig a 10 ft. x 10 ft. test pit within the hull. Their objective was to answer three important questions: 1) the size of the vessel, 2) the amount of preserved inboard structure, and 3) the type of fill inside the hull. After assessing the size of the entire feature, the composition of its sedimentary fill, and extent of preservation, Soil Systems archaeologists could discuss accurrate projections of the site's potential with Mr. Ronson and the Landmarks Preservation Commission.

On January 20, nautical archaeologist Sheli Smith joined Riess, Herbert, and Myers in expanding the test trench. The top 9 feet of nineteenth-century overburden were quickly removed by backhoe. Under the modern basement flooring, the overburden changed to exotic white coral sand and granite cobblestone, most likely ballast dumped off incoming ships. Two feet into the strata, we encountered wood which proved to be decking that extended throughout the test square (Figure 7.2), the only exception being in the northeast corner where raised boards, known as coaming, delineated a large hatch opening. The amount of preserved ship structure, including a gunport originally exposed in the deeptest trench, deck, and hatch coaming confirmed the significance of the feature.

The information gained from the ship's structural members supported the idea that the uncovered deck was the lower, or main deck below the weather deck. The position of the hatch indicated the centerline of the vessel. The hatch size suggested it was the main hatch, establishing the test trench's location amidship (the widest part of the hull, usually close to its center). Measurements from the ladder post (monkey post), centered against the afterhatch beam to the inside of the hull, indicated the ship's beam (maximum width) to be 24 ft. to 25 ft. Ratios for breadth to length in merchant ships were usually between 3 and 5 to 1. Thus the length of the ship was estimated to be between 72 ft. and 125 ft.

Upon realizing that this was an eighteenth-century merchant ship we felt that an archaeological study of the vessel would answer many questions about colonial period ship construction and maritime trade. No detailed plans or models existed of the common merchant ship of the period. No one had found and studied one before. Only scant contemporary written descriptions, and remains, models, and plans of warships were available. In addition, the extent of this ship's preservation was unique. Most archaeologically excavated ships only consist of the lowest few feet of the hull, but in some areas this ship was intact from the upper deck to the keel.

Besides learning more about the history of ship construction we could derive information about the trade of ship building materials and the status of applied engineering at the time and place of the vessel's construction. Most ship building material was transported to the construction site. Although a specific species of wood or type of metal was preferred for each component, several others would be acceptable. The type actually used on this ship for each component would be evidence about the state of the economy and trade networks of the building area at the time of construction.

Since the Renaissance, the study of physical forces and properties of materials by scientists and engineers has provided inspiration for a history of progress in ship building toward safer and more economical ships. Until this century ship building was the center of the highest technology of any country bordering the sea. But shipwrights learned their trade through years of apprenticeship. Their accumulated knowledge was never fully recorded. A study of this ship, with its unprecedented intact structure, might reveal much of early eighteenth century shipwrights' understanding about complex dynamic forces, stresses, strains, and strengths of materials.

In addition to insights into the history of technology and economics of the area which built the ship, the history of the buried ship, and her relationship with colonial history, might be revealed through analysis of the ship and her contents. We might be able to find a ship in the port and merchant records which matched this vessel. Further research, including comparisons of historical and archaeological data, could reveal much about the period's merchant trade and provide a better understanding of other historical records.

Although the ship's location and orientation in the port suggested a derelict ship positioned to crib fill for expansion into the East River, we hoped for remnants of her last cargo or cargo containers as evidence of the ship's voyages. Even if she contained no cargo we hoped to find her ballast in the lowest areas of the hull. The type of ballast, and the discarded artifacts which sifted into it, could provide evidence about the ship's history and the history of colonial maritime trade in general. Information such as the ship's actual cargo capacity versus its contemporary formulated cargo capacity might provide insights into studies of maritime trade records from the colonial period. The fill within the ship's hull could also increase our knowledge of the filling process for that area of the East River.

Figure 7.1
175 WATER STREET

The Ronson Ship
Outer Sheathing, Portside Hull

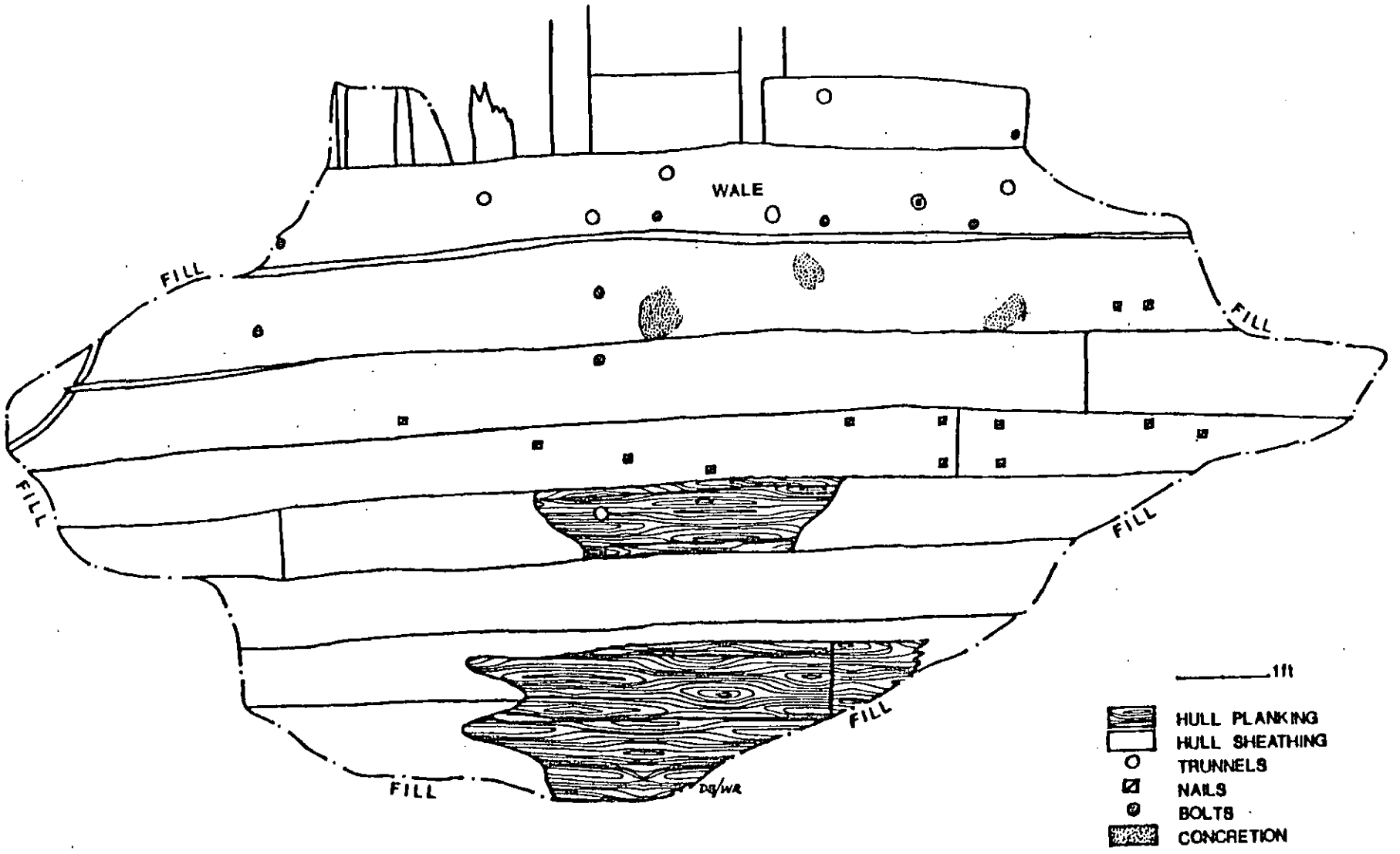
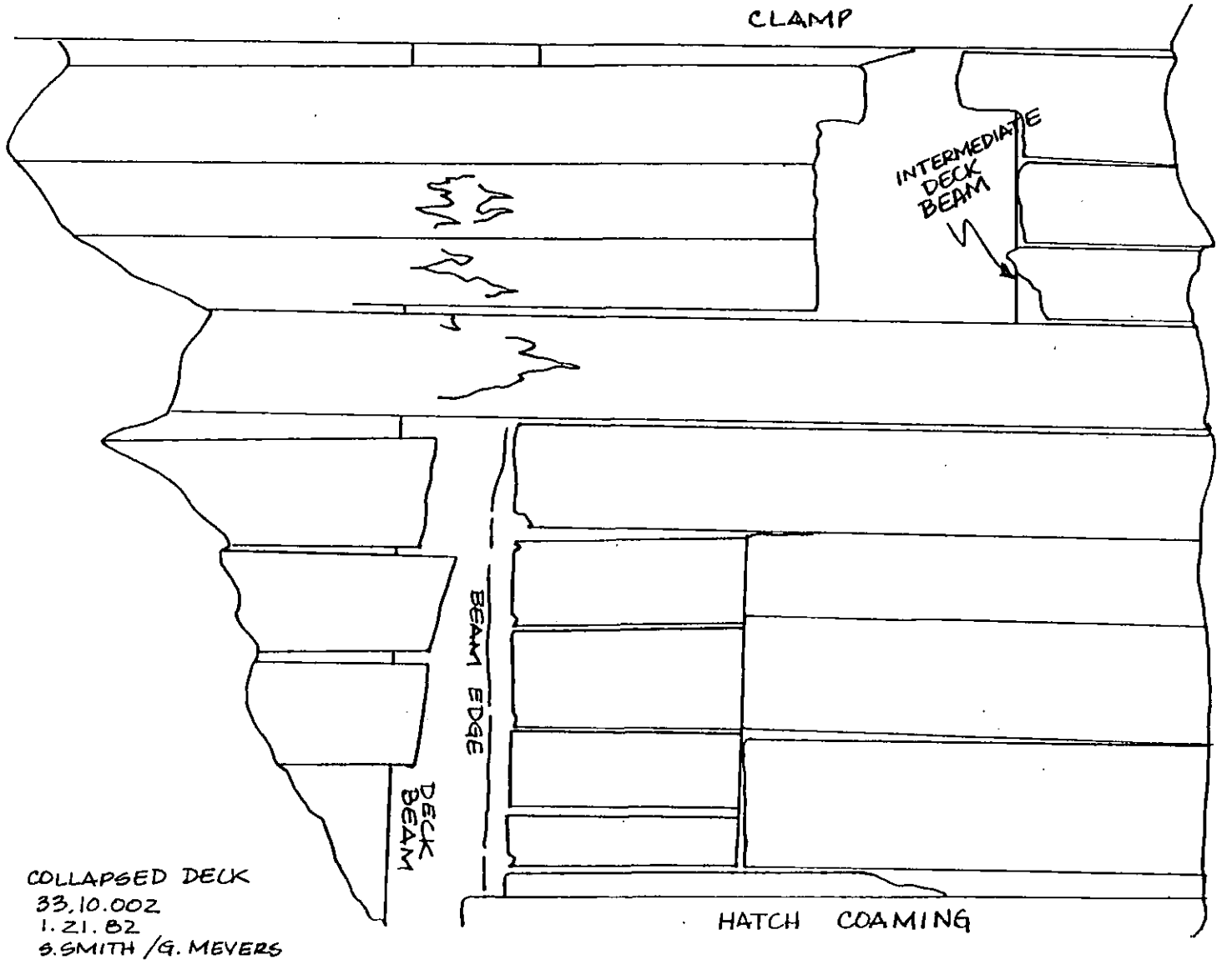


Figure 7.2
175 WATER STREET

The Ronson Ship
Collapsed Lower Deck



We therefore conducted an archaeological excavation of the ship and her contents and an historical search for the identity of the ship. We sampled the fill, recorded the hull, and removed the bow section for further study and a public display, and searched the colonial port records and local merchants' papers. For lack of a known proper name, the crew named the vessel after its present owner, "The Ronson Ship".

HISTORY

The light armament indicated by her gun ports and the large main hold indicate that the ship was a transoceanic merchant ship rather than a coasting merchant ship or a government or private war ship. A merchant ship involved in the coastal trade among the colonies would generally have been smaller and had the fore-and-aft rig of a schooner or brigantine. A war ship would have been more heavily armed and its decks arranged differently. Remains of specific teredo worms in her outer sheathing imply at least one trip to the eastern coast of South America or the Caribbean.

Although we do not know the ship's identity we can reconstruct some of her history. As a large ship rigged for transoceanic sailing and having made at least one Caribbean voyage, the Ronson Ship was an important commercial and social link to the rest of the British empire. In addition, if she was owned by New York merchants (see Chapter 2), she represents a significant investment of capital for colonists in the late seventeenth-early eighteenth century.

Being mainly farmers, fishermen, and woodsmen, the American colonists produced mostly foodstuffs, tobacco, and lumber supplies. They consumed or used the majority of their products within their respective colonies and shipped some to other colonies specializing in other products (Klingaman 1972:217-218). But, in order to buy necessary tools and supplies from other parts of the British Empire or foreign countries, the colonists had to ship some of their products overseas, where American foodstuffs, tobacco, and wood were in high demand. Although their products were simple in comparison to manufactures and crafts from England and Europe, the American overseas trade system had to be as sophisticated as any in the Western world in order to deal successfully in the international market. Their expansion during the eighteenth century indicates that they were successful (Egnal 1975:199).

American colonial merchants considered themselves British traders based in America because the 13 colonies were an integral part of the British Empire. The merchants were British subjects, used British standards of measurement and money, and were protected by, and subject to, the British Navigation and Admiralty Laws. No standard colonial port or merchant house existed because by the time Americans could export their surplus products, each port, and most merchant houses, were specializing in particular products. Generally the North produced fish, lumber, cask staves, furs, and some northern agricultural products such as grains, flour, and horses (Sheperd 1970:13-16). The Mid-Atlantic and South exported tobacco, rice, indigo, grains, flour, and southern timber products (Klingaman 1969:272 and Sheperd 1970:17-22). There was, of course, some overlapping, such as tobacco grown in New York (Garbert 1969:108).

Each region's choice of export goods depended on its geography, climate, and the inclination of its inhabitants. Because of varying storage and loading needs and the different eventual destinations of each region's products, each port and its merchants took on a special character of their own. Since large ports did not develop in much of the South, ships often traveled up river to trade with local merchants and farmers. In the North producers or buyers usually moved local cash products down river to an entrepot where they were shipped overseas or to another American colony. New York specialized in exporting flour and wood products, especially cask staves, along with smaller quantities of other produce (Naval Office Records 1715-1749).

Although not a large port in the colonial period, New York was very active and would soon grow rapidly due to the merchants' aggressive policies in warehousing, communication, cargo handling, dock-side justice, and competitive pricing. In addition, the New York merchants actively developed trade within the area hinterlands to acquire colonial products and sell their imported goods. Because of their success in these endeavors New York eventually was able to offer the area the best prices for many local products and a greater variety of foreign goods at a lower price. The city was therefore able to economically overcome its nearest rivals: Boston, Baltimore, and Philadelphia (Albion 1939).

If a merchant did not own his own ship, he paid shipping rates per quantity of cargo or leased space on a ship. But more often a group of merchants would pay the lowest rates by leasing the whole capacity of a ship for a voyage. A large vessel, such as the Ronson Ship, was often hired at a cheaper price per ton than the average ship of the day (Sheperd and Walton 1969:242-243).

British customs agents carefully watched the entrances and sailings (exits) of ships to insure compliance with navigation and trade regulations. Most of these regulations protected merchants and shipowners from foreign competition within the empire. In order to finance the customs offices, each ship entering and leaving was charged a duty based on its carrying capacity. But the duty was small compared to other costs and benefits of a voyage, so contrary to popular literature, there was little incentive to smuggle.

In the early eighteenth century, New York was a small port with only a sparsely populated hinterland to produce surplus goods and buy imports. But its flour and wood products were in demand overseas, especially in England and the British West Indies. New York also had a good harbor, centrally located in the 13 colonies, and was therefore used by the British as an important military terminal (Albion 1939:2-6).

By the middle of the eighteenth century, New York's hinterlands had established themselves enough to produce significant amounts of flour, wood, and other products for export. The port of New York expanded accordingly, as did its need for larger, more economical ships. Studying the port records, we found that prior to 1720 few ships entering the port were registered at over 100 tons. But in the next few years the larger ships became more common (Naval Office Records 1715-1749).

The Ronson Ship was one of the larger ships entering the port. She was able to carry a great deal more cargo than most ships and yet required only a few more men for sailing, cargo handling, and defense operations. Her owners or leases could take advantage of the developing warehouse storage system in New York and other large American ports that eliminated the former necessity of selling or buying cargoes piecemeal to many merchants and consumers. Therefore, merchants in mid-eighteenth century America could use a ship of this size to attain a competitive transportation cost-per-ton-of-cargo ratio (Walton 1966:596).

Such a large merchant ship generally traded only at major entrepots because her large quantity of cargo would flood a smaller local market, and thereby devalue itself immediately. In addition, her deep draft could only be easily accommodated by a deep port. Likely ports in the British empire were New York (a small but rapidly growing entrepot at the time), Boston, Philadelphia, and Charleston in the 13 colonies, Jamaica, Barbadoes, and Antigua in the British West Indies, and London, Bristol, Liverpool, and Dublin in the British Isles.

The builder of the Ronson Ship made the bow blunt to provide a maximum carrying capacity. Previous to the inspection of this ship, researchers assumed that merchant bows were well rounded above and just below the water line, and became more narrow in the lower section of the hull. Contemporary designs and remains of war ships are narrower at the bottom. But the owners of the Ronson Ship, and possibly other merchant ship owners, were more interested in carrying capacity than in speed for a vessel which might average ten months per round trip. Most of the trip was usually spent in port loading, unloading, buying, and selling. Speed was therefore not important to a merchant ship captain who could fight off most pirate vessels but could never hope to outdistance a war ship. Even in later years, sharp bows and high speed were only important to a few merchants involved in special trades (Chapelle 1935:274).

In the first half of the eighteenth century the tonnage of ships in the British Empire was an indication of the approximate number of large wine casks (tons) which the ship could carry in its hold plus the dry weight of the ship. To standardize methods of deriving the tonnage, shipwrights used the following formula (French 1973:434):

L x B x 1/2 B/94 = Tons-and-tonnage (gross weight)
Where L = length of the flat portion of the keel
and B = maximum breadth of the hull
1/2 B was occasionally replaced by the depth of hold

Cargo capacity, or tons burden, was approximated to be two-thirds of a merchant ship's tons-and-tonnage. For the Ronson Ship the length of keel was approximately 79 feet and the maximum breadth was 26 feet. Therefore:

79 x 26 x 13 / 94 = 284 tons (tons-and-tonnage).

Two-thirds of 284 equals 189 tons burden (cargo capacity). Actual registered tonnage was generally rounded to the nearest ten tons and may have varied by as much as 20 tons high or low.

During the colonial period ships were contracted to be built using the tons-and-tonnage figure, and all British war ships were registered using the same formula. In addition, merchant ships were hired by the military using tons-and-tonnage and non-American British merchantmen were registered using the same figure. But recent research (McCusker 1967:82, 90 and Walton 1967:393-396) indicates that American merchants registered their ships by the capacity figure. Thus, if the excavated ship's owners were American, they probably would have registered her at between 170 and 210 tons; if they were from overseas they would have used 260 to 300 tons.

With the tonnage figures in mind and an original burying date estimate of 1740-1750 we attempted to learn the identity of the ship by reading through extant records of the contemporary lot owners of the block and studying the New York Naval Office Records. The first method was conducted by Amy Friedlander and the second by Amy Friedlander and Warren Riess. However, the contemporary lot owners did not mention the ship in their existing records and the Naval Office records give no direct reference to it.

During the eighteenth century the British government assigned a local civilian at each colonial port to act as Naval Officer, recording each cargo carrying ship to enter or leave the port. The naval officer copied selected information from the ships' registration papers and recorded other pertinent information about the ships' voyage in a ledger. The records from these ledgers are extant from 1715 to 1783 with a few short gaps. They are in the British Public Records Office but are available on microfilm in the United States.

We decided to study the Naval Office records from 1715 to 1750 because although the 175 Water Street block perhaps was being filled in the 1740s (see Chapters 2 and 5), it is possible that the colonist brought the ship to the area a few years earlier. The ship may also have been discarded some years before that, possibly even before 1715.

We recorded the entry and sailing of each ship registered at 100 tons or more from 1715 to 1750 to be sure of any possible variations in tonnage figures. This choice eliminated most of the recorded entries because the average ship using the port was well below 100 tons. Using a microcomputer, we then sorted the 376 records by "ship's name" in alphabetical order and subsorted by "date of record entry" in chronological order. Once in this format, we could see that the 376 arrivals and sailings studied represented the movements of 106 different ships. Only 26 (25 percent) of these ships were registered at 150-plus tons, and none of the 26 were listed as being even partially owned by lot owners of the 175 Water Street block.

Partial ownership in vessels was common for the period, since few could raise enough capital to own an entire ship. Even if they could, most merchants preferred to maintain shares in a number of ships to insure against bankruptcy in case of the loss of one ship due to storm, piracy, or other disaster. The lot owners of the block would have been more likely to use an old ship, in which they had a share, to set in the river as cribbing. But they may also have used another derelict.

The last records of five of the 26 ships were arrivals, rather than sailings. Although these may represent mistakes made by the Naval Officer, they probably indicate ships which never left port. We conducted a preliminary study using the five 150-plus ton ships' names as leads, but found no reference to any of them having been set in place for the filling operation. However, future planned studies of merchant, government, and insurance records may uncover the ship's identity.

STEM, KEEL, KEELSON, and STERNPOST

The first pieces laid down in a shipyard when a ship is built are the keel, stem, and sternpost. First the keel is laid straight atop heavy blocks; next a curving stempost is scarphed to the bow end. Then, the tall canted sternpost is set into a mortise at the aft end of the keel. Once in place these pieces are aligned and tightly shored up. It is important that they remain aligned, for they form the centerline of the ship. If they fall "out of winding", the entire ship will be askew.

For a ship of the Ronson Ship's size, these pieces are necessarily quite large. Both the stem and sternpost cores were single timbers, carved to shape. Unfortunately, we were only able to touch blindly the top of keel and briefly glimpse the sternpost (Plate 7.1). On the other hand, we removed the entire stem structure for conservation and are in the process of closely studying it. The complete stem structure was not a single piece, but two large curved timbers (Figure 7.3). The outer or main stem piece measures 14 feet 12 inches from tip to tip. Its forward side abutted the beak members. The crescent moon curve of the stempost formed the profile of the bow. Twelve inches wide at each end, the stempost widens to 16 inches at the center. A rabbet begins on either side 11.5 inches from the top. The rabbet continues down the sides, veering off the stempost where it once scarphed to the keel.

A second large timber faced the stempost on the inside of the bow. This inner stem piece ran with the curve of the main stempost down to the top of the keelson. On the forward edge of the inner stem a second rabbet is carved. This rabbet provides a seat for the interior ceiling planks. Near the lower end of the inner stem is a small step. The lowest breast hook sat on the step.

A third smaller timber sat on top of the two large complementary stem pieces. The third timber's width dimensions are the same as the other two pieces, but the timber's top was badly eroded. Originally, it probably extended up to the bowsprit.

The dimensions of the stem post provide much information about parts of the ship that we never saw. For instance, since we have the majority of the stem we know approximately where the bowsprit entered the hull, even though the actual bowsprit was removed some time in the eighteenth century. The dimensions of the main stempost scarph reflect the dimensions of the keel we were never able to see. This valuable information will be extremely helpful in the reconstruction of the ship, both on paper and in actually rebuilding the bow.

Working roundabout, we know that the dimensions of the keel were 12 inches by 12.5 inches where it scarphed to the stempost and we know that the top of the stempost was approximately 89 feet from the top of the sternpost; therefore, when we subtract 5 feet for the stempost and 5 feet for the canted sternpost we arrive at an approximate length of 79 feet for the keel. Thus without ever seeing the keel, we can approximate its dimensions, 12 inches by 12.5 inches by 79 feet. It is doubtful that a span this long could be cut from one timber, but how many pieces were scarphed together to make up the keel length we will never know.

During the final demolition of the site, we were able to direct the large swivel backhoe to explore the stern. The sternpost had been severely smashed where it entered the transom of the ship. The main post was a single piece and its sided dimension was exactly the same width as the keel. A rabbet was carved halfway down each side; then it veered off onto the deadwood. Bolted to its aft face was a piece approximately 3 inches thick and the same width as the stem. This shoe-like plank extended about a third of the way down the sternpost. At its lower end a heavy metal band, probably the uppermost gudgeon, wrapped around the post; beginning at the after edge of each rabbet. The vibrations of the backhoe and pile-driver caused the shoe to fall off, and we could see that the moulded dimension of the sternpost began to curve in away from the shoe and gudgeon. The curve continued down to the junction of the sternpost and keel where the moulded and sided dimensions of the sternpost matched the keels. This thinning of the sternpost was most likely for swing allowance of the rudder. After exposing the sternpost, the large backhoe knocked the post free of the keel. For a brief moment before the mud slid back, we could see the keel and sternpost mortise. The keel's end angle was a continuation of the inward curve of the sternpost and the mortise appeared to be about 4 inches square, set centrally in the keel's top face.

Turning quickly, we tried to study the sternpost as it moved above us in the backhoe bucket toward the awaiting dump truck. A complementary tenon about 4 inches square and 5 inches long extended down from the post's base. It was not centrally located, but placed more toward the after side. We could not make out the other locations of the gudgeons. The rudder we had hoped to find was gone, probably unshipped when the Ronson Ship was brought in for cribbing.

FRAMING

Frames form the rib case of a ship. Their shapely curves define the form of the vessel, how much cargo she will hold, and how she will handle in the water. Therefore, a shipwright spent a good deal of time making sure that the frame shapes were exactly right.

Line drawings made to scale, were introduced into shipwrightry somewhere between the late-fifteenth century and mid-sixteenth century. Accurate scale drawings enabled the shipwright to predict the shape of the vessel as well as her tonnage. The earliest examples we have of ship lines were drawn by Matthew Baker, a master shipwright in England between 1538 and 1549 (Abell 1981: 36-38). In Baker's book, Fragments of Ancient English Shipwrightry, he

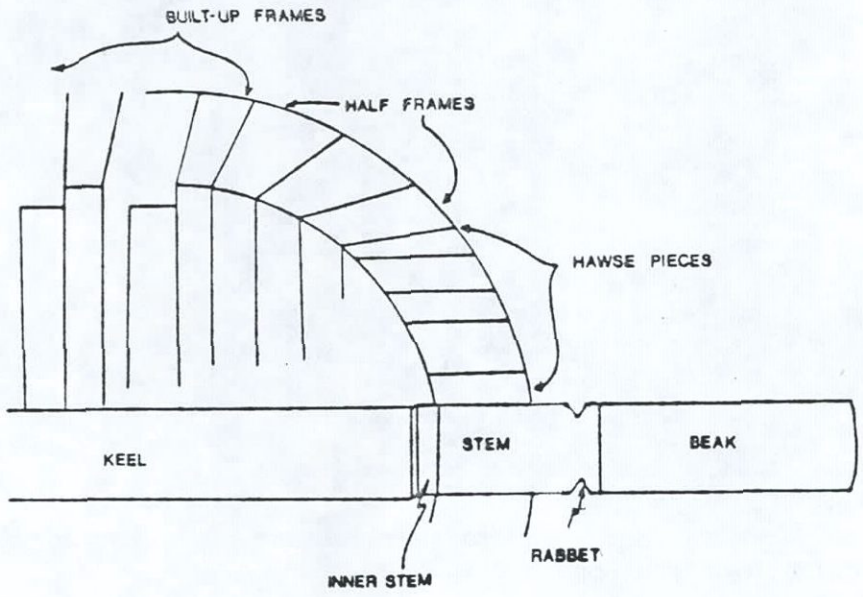


Plate 7.1: The arrow indicates the stern post exposed during final demolition of the Ronson ship.

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Figure 7.3
175 WATER STREET

The Ronson Ship
Detail of Bow Construction,
Schematic Plan



explains how to draw lines and calculate tonnage. However, Baker's scientific approach to shipwrighting appears to have been the exception rather than the rule. Shipwrighting remained a traditional skill handed down from one generation to the next for another century. Then, in the late 1600s, young master shipwright Anthony Deane gained fame for accurately predicting the draught of a ship (Abell 1981:53). To do this, he used Archimedes' third-century B.C. formula for figuring displacement and specific measurements taken off the line drawings of a ship.

Deane's combined use of mathematical principles and line drawings graduated shipwrightry from handed down tradition into the realm of practiced science. His floating examples and book on naval architecture published in 1670 became the pattern for later shipwrighting textbooks (Abell 1981:56).

The Ronson Ship design is a product of this transition toward scientifically built hulls. Her timber shapes were born on paper and, later, full size drawings were laid out on a loft floor with chalk. Patterns or moulds were then made from these drawings. Timbers were matched up to the moulds and adzed to the exact shape. No single timber could complete the various curves defined by the pattern, so five pieces were butted together to make the entire curve. This composite frame consisted of a floor, the largest of the timbers which crossed over to both sides, the second futtocks ("foothook"), which butted up against the floor, and top timbers which made the reverse curve in the upper portion of the hull.

Realizing the butt joints were not very strong, the shipwright cut out a second set of timbers on the same mould. This time six pieces were used to create the desired curve. The lowest futtocks or first futtocks did not cross the centerline but met in the middle and continued up about halfway past the floor/second futtocks butt joint. The third futtocks butted to the first futtocks and continued past the butt joint of top timbers. Two more top timbers were butted to the third futtocks and continued up to the top of the hull. Later these were capped with a rail.

Both frame sets were then treenailed tightly together, doubling the frame's width and staggering the weak butt joints (Figure 7.4). The built-up frame was stronger and increased the face or sided dimension where treenails would later be driven to attach the outer and inner planking. Approximately 36 of the Ronson Ship frames were built up in this same manner.

After assemblage, the frames were erected atop the keel. Lines were strung fore-and-aft as well as crosswise to make sure that each frame sat perpendicular to the axis of the keel. Shoring was then erected around the frames to hold them in place. Next the keelson was laid down on top of the frames, directly over the keel. Drift bolts fastened keelson and frames to the keel.

Then to check the fairness of his hull, the shipwright strung a ribbon ("rib-band"), lengthwise along each of the sides at predesignated points: at the "floor" sirmark (near the outer end of the floor), at the "breadth" sirmark (greatest expanse of the frames), and at the top of the frames (Sutherland 1711). The ribbons, or battens as they were later called, were strips of flexible fir anywhere from 1 inch to 5 inches square.

In the forward bow area, the frames were more angular and larger in their moulded dimension than those further aft. Although set in pairs, they were not treenailed together. The second futtock on frame T was quite massive and angled radically forward. Near its top steps were axed out. In these steps stood large vertical timbers called hawse pieces. Four hawse pieces graduating in size toward the stem rode on top of frame T (Plate 7.2). Five vertical hawse pieces stood on the starboard side. Tightly packed together on either side of the stem, they formed a solid wall across the bow. The radical angle of frames R and T continued the solid wooden wall aft, completing the curve of the hull from the apple-bow to the straight sides of the ship.

When we disassembled the bow parts our respect for the shipwright grew a hundredfold. The care he had taken to achieve that solid wall, meshing each of the angled forward frames perfectly, forced us to trace his steps backwards in order to disassemble his wall of wood. We were further surprised when we closely examined the lower futtocks and floors of these same frames. Instead of continuing their gentle bulbous curve down to the stem and keel, their curve dramatically reversed at the floor and first futtocks, bringing the outer planking in almost vertically on top of the keel. The reverse curve of the forward frames would not have been visible above the water. It would however, allow the ship to cut through the water more easily, alleviating strain on the stem and forward most frames.

The first futtock of frame T in the bow curved out from the sides of the stem and filled in the sap between the bottom of the hawse pieces and the after floor/futtock set of frame T. The floor of frame T sat just aft of the inner stem on top of the stem. All the bow frame sets sat perpendicular to the keel and stem in the bow. There were no cant frames (frames angled off the stempost) in the Ronson Ship.

This information is of great interest to those studying ancient hull forms. Sometime around the eleventh century A.D. cant frames were discarded by shipwrights in favor of hawse pieces. By the mid-eighteenth century, sleek Chesapeake bows gained popularity. The more severe bow once again required cant frames. Scholar Howard Chapelle has placed the reintroduction of cant frames between 1650 and 1750. The Ronson Ship hawse pieces represent the latest evidence for their continued use. Thus, the dates for the transition period from one bow design to another are further narrowed.

Between frame set R and the next set aft a space occurred, ending the solid wall of wood in the bow. From this set aft a space was placed between each frame. Beginning with 3 inch to 4 inch spaces in the bow they increased to an average of 7 inches in the amidships and stern (Table 7.1).

Following the frames aft, each set assumed a slightly larger curve until amidships, which was the widest point in the hull. It occurred approximately 30 feet behind the bow. The amidships frame spanned 25 feet 10 inches from the outer edge of the frames at the lower deck waterway. Above this point the frame sets reversed their curve, narrowing back in. This reverse is called "tumble home".

Figure 7.4
175 WATER STREET

The Ronson Ship
Amidship Built Up Frame

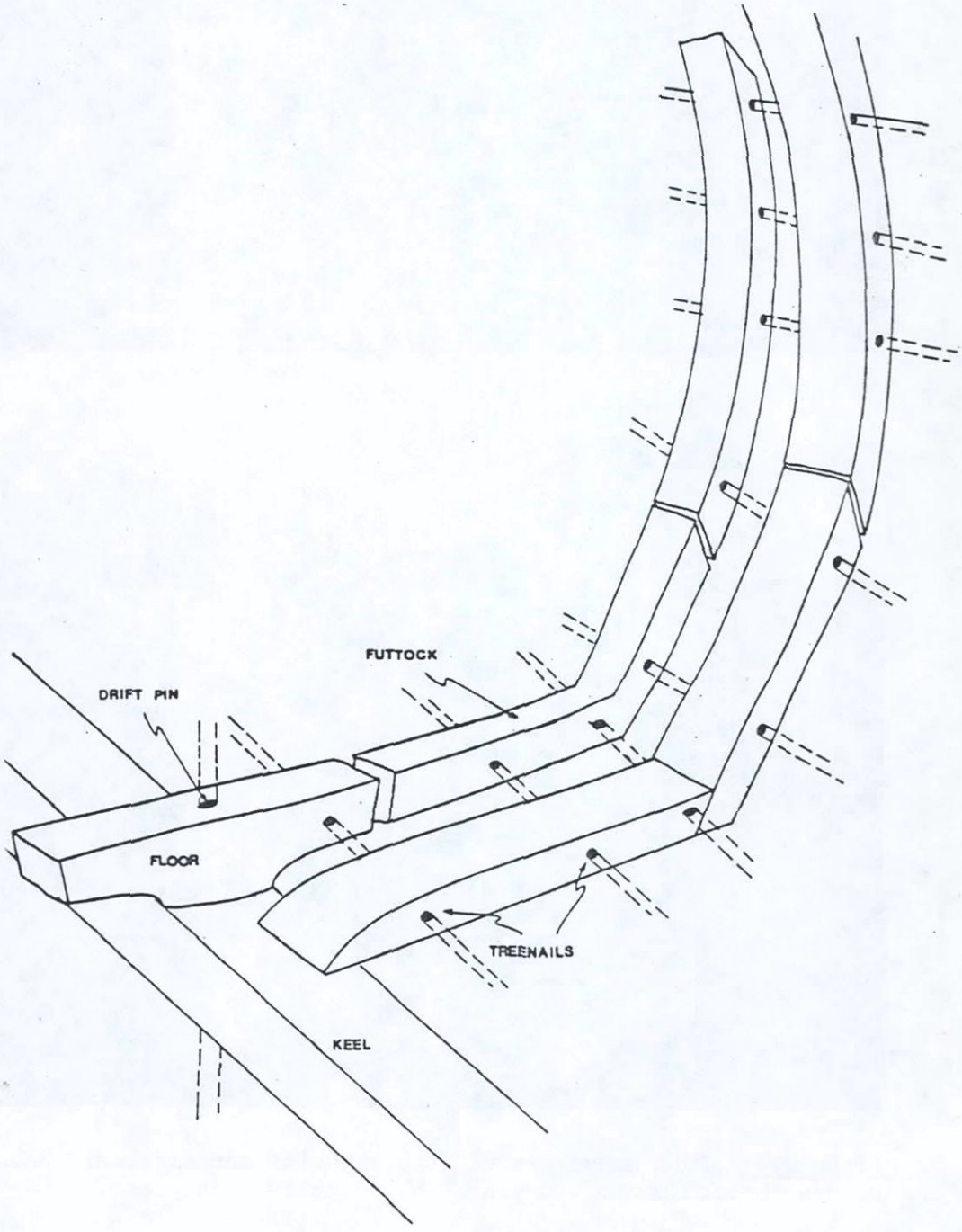




Plate 7.2: Port hawse pieces (upper photo) and starboard hawse pieces (bottom photo). Mylar tags identify each piece.

TABLE 7.1 175 WATER STREET Room and Space

Frame no.	Hull side	Sided at 2nd futtock (inches)	Moulded at 2nd futtock (inches)	Spacing at 2nd futtock (inches
T	port	16		0
T	stbd	17.5		0
S	port	8		0
S	stbd	5		0
R	port	13	11	0
R	stbd	13	11	6
Q	port	15	11	4
Q	stbd	13.5		3.25
P	port	15	11	2.5
P	stbd	15	9.5	2.25
O	stbd	15	9	3
N	stbd	15	9	wall
LOT 31/32 WALL (Frames M-F masked by wall)				
E	port	14.5	8.5	7
D	port	13.5	8	7
C	port	14	8.5	5.5
B	port	14	8.5	6.5
A	port	13.5	8	3.5
0	port	14	8	7
1	port	15.5	8.5	7
2	port	13.75	8	7
3 gunport	port	14	8.5	7
4	port	14.25	8.5	6
5	port	14.5	9	5
6 mast	port	15	9	6
7	port			
8	port	8	9	wall
LOT 33/34 WALL (Frames 9 and 10 masked by wall)				
11	port	8	9	4.5
12	port	17.7	9	6.5
13	port	17	9	7.5
14	port	17.75	9.5	7
15	port			
16	port			
LOT 34/35 WALL (Frames 17 and 18 masked by wall)				
19	port	4		
20	port			
21	port	16.5	8	0
22	port		5	0
23	port	19	13	0

All the amidships floors were flat. The frame turned up abruptly at the end of the floor creating a hard chine (Figure 7.4). All the frames exposed in the amidships section of the hull were shaped in the same fashion as the amidships frame.

From the first frame set in the bow to the amidships frame, floors are positioned on the stern side of each set. After the amidships frame, the floors are on the bow side. The flip is common in shipbuilding. It reflects the widest point in the hull and the changing bevel of the frames. The two frames back-to-back at amidships make an especially strong, complex frame at a point of great stress along the hull.

The frame sets aft of amidships each narrowed slightly, forming the gentle taper in the after section of the hull. Then somewhere just behind the mainmast but obscured in a wall, the frames turned in at a greater angle and narrowed evenly back to the stern.

In this same lot wall, approximately 6 feet to 8 feet behind the mainmast, the rise of deadwood began Deadwood is built up in the same manner as the beak. Large timbers are fitted together in puzzle fashion and then bolted with drift pins to the keel and sternpost. In the Ronson Ship they created a stepped wall of solid wood rising from the keel to the top of the sternpost (Figure 7.5). A rabbet or groove was more than likely carved into the deadwood to accept the outer hull planking. When the sternpost was excavated, a rabbet did curve off the sternpost onto the deadwood providing a seat for the outer hull planking. Frame sets were positioned on the steps of the rising deadwood. These frames no longer had the flat floors as in the amidships section, but curved gently up (Figure 7.4).

In the extreme stern, the frames sat very high on the deadwood. Although still doubled, they ceased to be treenailed together. As in the bow, the stern frames were quite large and angular. The sternmost floor occurs at frame 21. Frame 22 is a very small piece with no abutting futtock and no space between frame 23, immediately aft or frame 21, immediately forward. Frame 23 was a complex group of pieces. First as with other frames, a futtock stretched between the centerline and the turn of the hull. Next, an upright futtock abutted the top end of the first futtock. Then, a massive timber resembling a floor but much thicker and straight across its top edge, sat up against the aft side of the first futtock. Along the top edge of this timber, notches were cut out for deck carling. Another upright futtock abutted its sloped end at the turn of the hull. Directly behind this large timber sat the transom piece. From the outside of the hull the top face appeared to be thicker than the lower edge. It was a well-finished piece; widest at the centerline, it curved in at the port edge finishing the line of the hull (Plate 7.3). Along the back top edge of the transom piece, shallow notches were chiseled out for the transom knees (Plate 7.4). Also, sticking out of the top face of the transom was a metal collar, 3 inches in diameter. J. Richard Steffy has suggested that this may have been a scupper.

The transom was the last large timber to span the after end of the hull. Directly behind it in line with the keel and deadwood stood the canted stern post. Between the stem and sternposts excavators exposed frames T-N in the bow, frames E-A and frames O-8 in the amidships section, frames 11-16 aft of

amidships, and frames 19-23 in the extreme stern. After calculating the widths of the lot walls and frame sets, we concluded that lot wall 31/32 masked frames M-F, lot wall 33/34 masked frames 9 and 10, and lot wall 34/35 masked frames 17 and 18.

CHOCKS BETWEEN FRAMES

During the final measurements of the amidships section lines, we noticed small wooden chocks wedged tightly between each frame set near the ends of the floors. Upon closer scrutiny we could not find any holes or channels in the undersides of the chocks through which bilge water could pass. We did note that the chocks did not come up to the top of the frames but stopped 1 inch short. However, even with the inch space we observed that at least 6 inches of water continually stood on the outside of the chocks. Traditionally, sailors tried to keep the bilges as free of water as possible. Standing water quickly becomes rank and if the water is fresh, rot is always a danger.

J. Richard Steffy and Peter Throckmorton, suggested that the chocks might be bilge baffles. If the bilge of the Ronson Ship was full of water when she heeled over, a significant amount of fluid weight moved in the space between the ceiling and outer hull trying to reach a level equilibrium. Unchecked, the sloshing water could sink the ship. Thus by placing the chocks at the ends of the floors, at least 6 inches of water was kept from traveling up the hull side. Once again, we were confronted with the Ronson shipwright's keen insight into the properties and weight of fluids.

OUTER PLANKING

Outer planking is often referred to as the "skin" of a hull. William Sutherland summed up its intrasal function in shipbuilding in 1711:

> Planking . . . which is a Branch so very material, that unless it be carefully done, it will undeniably mar all the other good Properties belonging to any Ship. For Planking a ship is like skin, Sinews and Ligaments to an Animal. But then the outside Planking is not barely meant, but all Clamps, Spirkit-risings (planks below gunport), and thick Stuff, besides Wales, Channel-wales without board. This part of Planking ought to be well performed, by Joining, Fastening and Calking, and the Goodness of every Inch of those Materials carefully inspected.

To lay-out planking for such a complex object required a good deal of planning. Usually, the shipwright began with the wales. These were twice as thick as the planking and wrapped in belt-like fashion around the ship.

Three 4 inch thick wales girdled the Ronson Ship. The lowest was placed outside the lower deck clamp and water way. This was at or just above the hull's waterline. Outside the upper deck clamp and just above the gunports, two more wales (channel wales) belted the ship. Once these were securely bolted and treenailed to the frames, planking began.

Usually, two teams laid plank. One team started at the bottom fitting the "garboard" strake into the rabbet of the keel and then laid other planks up the hull trying to keep them as parallel to the girth as possible. The second team began at the top of the hull, laying the "sheer" strakes, and then worked down to meet the first team somewhere in the middle. The final gap was closed in with a "shutter-in" plank.

Prior to planking, battens were strung along the frames and the angle of the "ribbon" on each frame was carefully marked. Before laying the planking, the frames were adzed to the correct angle designated by the batten. This insured that the planks would lie flat against the frames.

The shipwright clamped each plank in place, then tacked it on with small nails while he permanently attached each plank to the frames with treenails. As he came to the bow and stern of the ship he decreased the number of strakes by "stealing" certain planks out.

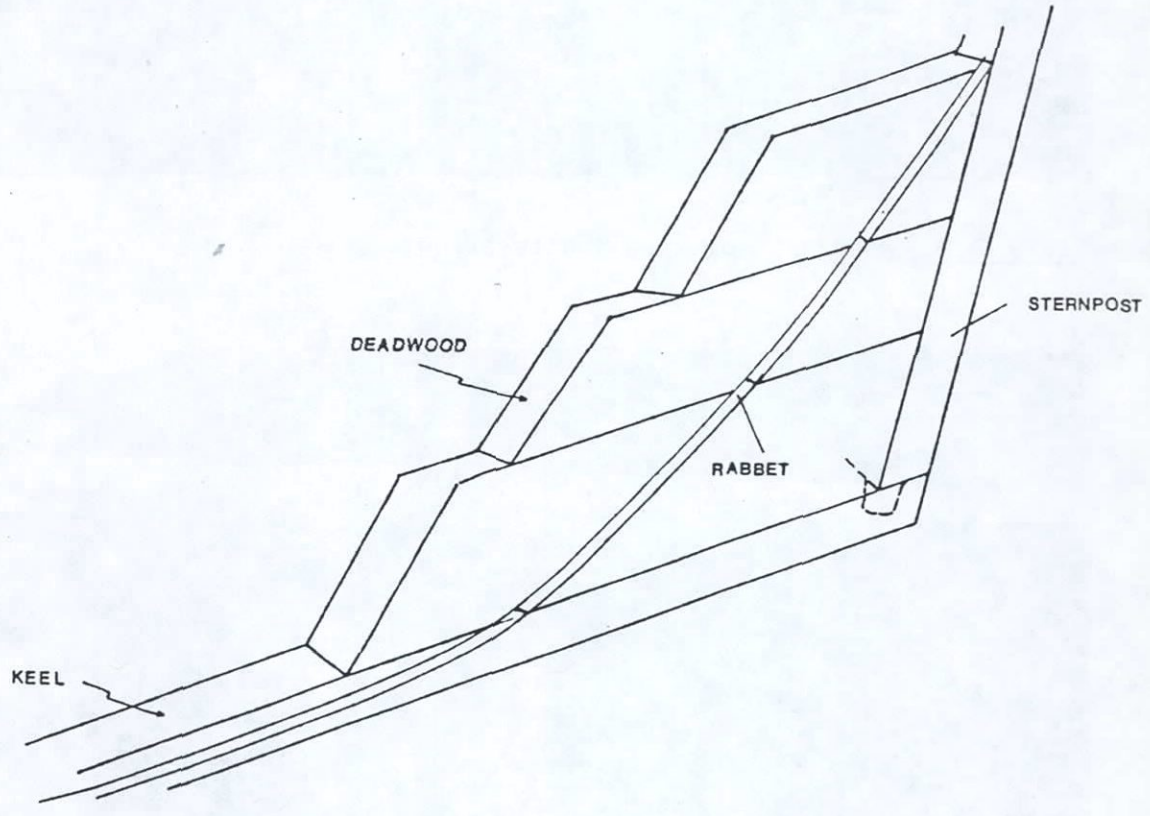
Bending the planks to fit the curves in the bow and stern was another problem of planking. The Ronson shipwright charred the planks over an open fire to achieve the correct curve in the bow planks. This was a common English practice as shown in Arthur Tooker's sketch of Anthony Deane's shipyard in 1675 (Plate 7.5). The wales, however, were too thick to be bent and the shipwright followed the advice of William Sutherland and cut his wales to fit the bow curve:

> Snying (bending up) is observed to make the working of Ships Bow very difficult, and the Planks to perform the same very chargeable to be purchased. Since all the Plank, which births up any Ship's bow, must be converted from principal compass Timber (tree trunk hewn square). For altho' Plank may be easily bent flat-ways, yet take what Method you please, it cannot be near so well bent edge-ways, because of the great Disproportion between the Breadth and Thickness.

To insure that there would be no inconvenient fracture lines along the hull, the shipwright carefully placed the butt joints in the planking. The rule of thumb for butt spacing, placed joints at least 6 feet apart, with three "passing strakes" between joints on the same side of the hull (Abell 1981:81). The Ronson shipwright seemed to use this rule when he laid his planking, even though it was difficult for us to observe the planking pattern from the inside of the hull. We counted 14 strakes in the amidships section between the keel and the main wale, compared to eight strakes between keel and wale in the bow. In several instances we noted what looked like a stealer, but again, in the dirt and darkness we could not be sure. Plate 7.6 shows how the planks followed the narrowing curve of the hull in the sterm, while still running fairly parallel with the centerline of the ship. All the planking followed the curves of the hull while trying to maintain a parallel run. The only exception occurred on the transom, where diagonal planking was laid across the rear end of the transom, going from starboard to port. A second layer was laid underneath from port to starboard.

Figure 7.5
175 WATER STREET

The Ronson Ship
Assumed Stern Structure



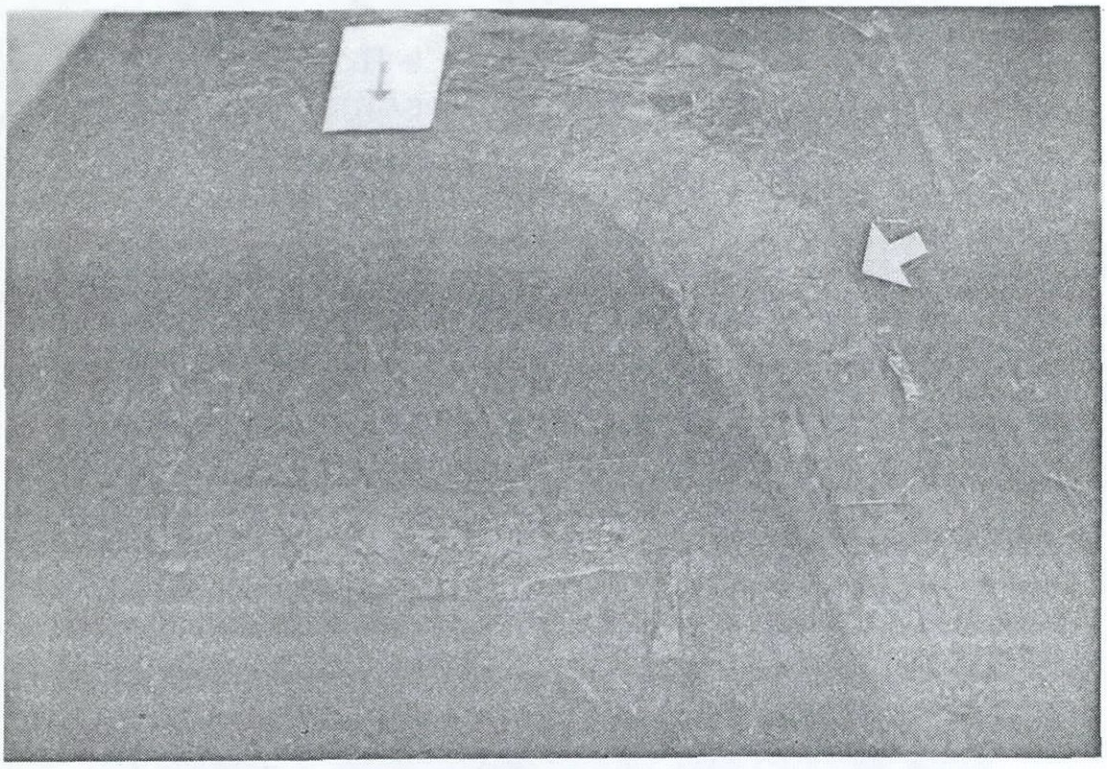


Plate 7.3: Wing transom knee (white arrow).

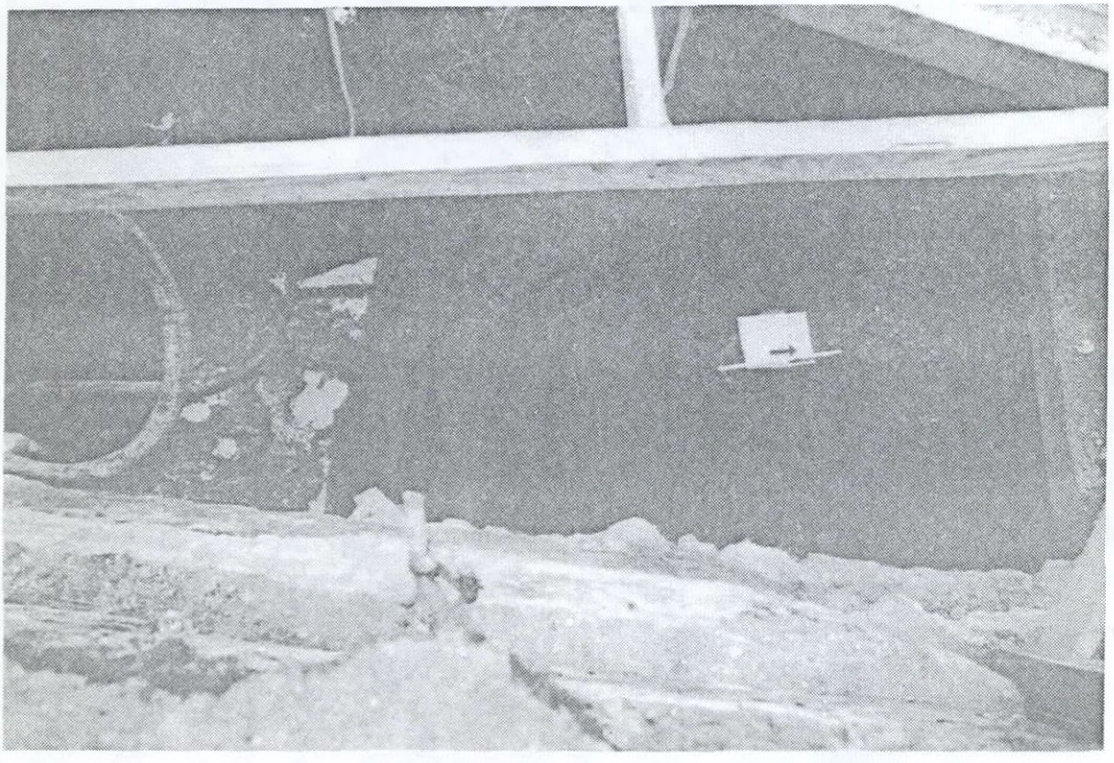
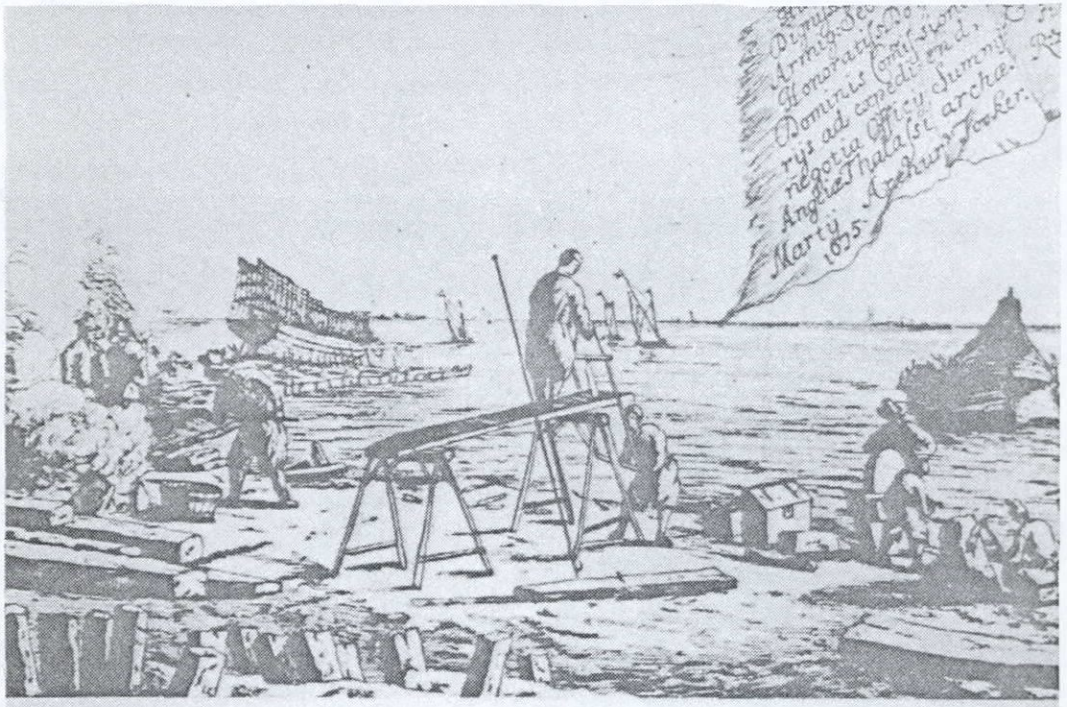


Plate 7.4: This overview of the stern shows the wing transom knee curving around against the transom.



A SHIPYARD OF 1675

Plate 7.5: Arthur Tooker's sketch of charring planks for shipbuilding (from Abell 1948, Plate XIV).

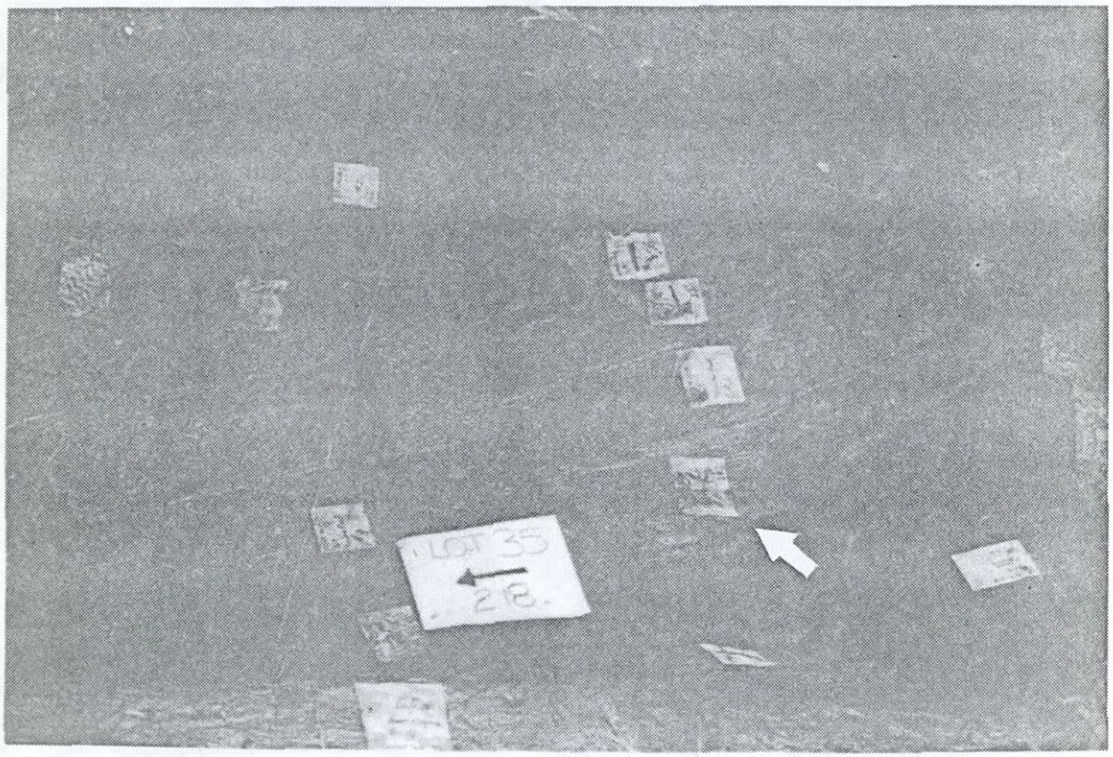


Plate 7.6: The ceiling planks in the stern follow the inward curve of the vessel toward the stern post. The white arrow indicates the collapsed ceiling that once enclosed the final frame. Mylar tags identify the ship's pieces.

Figure 7.6
175 WATER STREET

The Ronson Ship
Profile of Upper Deck Structure

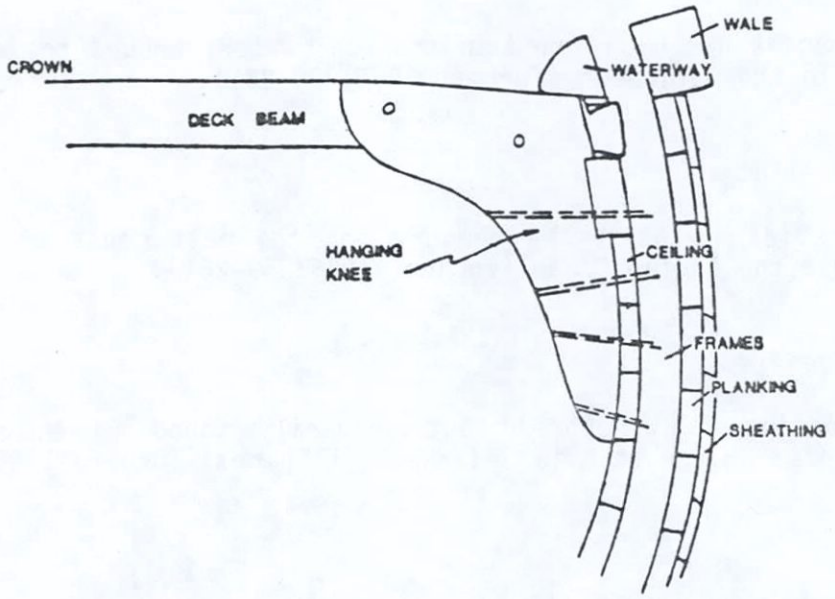


Figure 7.7
175 WATER STREET

The Ronson Ship
Lower Deck Structure

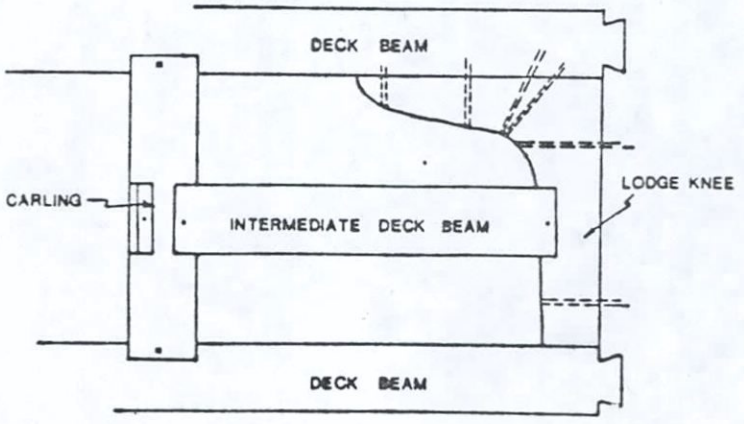


TABLE 7.2 175 WATER STREET: Teredo Worm Species

Bankia carniata

This species has been found in tropical waters around the world from the Mediterrean to the Caribbean (Turner, 1966:258-261).

Bankia campenellata

This species is primarily found along the east coast of South America and throughout the Indian Ocean (Turner, 1966:259-261).

Teredo mindanensis

This species is widespread but primarily found in the water of the Pacific Islands, Southeast Asia and the Phillipines (Turner, 1966:260).

Note: The identification of teredo species was done by Dr. Ruth Turner of Harvard University and Avery Stone of Columbia University.

Directly behind the transom, lapstrake planks lay athwartships. They continued out 5 feet, with their port edge following the after curve of the hull. When we removed these planks, we noted how smooth and waterworn their undersides were. These had formed the floor of the transom superstructure, hanging out over the water behind the hull.

In the stern, the transom planks offered our only chance to observe the hull caulking in daylight. Each seam was liberally filled with the same compound -- pine pitch, fibers and sawdust -- that we found throughout the decking seams inside the ship.

Outside the hull amidships and in the bow we discovered black pitch and horse hair slathered over the planking. This gooey, stinky compound was sandwiched between the planking and an outer thinner layer of planks, known as "firring" (Figure 7.6). The firring boards were 8 inches to 12 inches in width, but only 1 inch thick. They covered the entire hull below the main wale. To insure their easy removal only small nails held the firring to the outer planking.

The shipwright had placed this extra layer of planking over the hull to save the more expensive and harder to replace outer planking from teredo damage. All of the pieces of firring we recovered were badly riddled with worm holes. Remnant parts of the worm casings were still visible in the worm riddled firring. These casings were studied and identified (Table 7.2). Dr. Ruth Turner and Avery Stone identified three teredo worm species from the casings. Two of the species are widespread varieties living in temperate waters around the world. The third species is primarily found on the east coast of South America. Teredo worm identification is valuable information as we reconstruct the life history of the Ronson Ship. Every two to three years the owner of the Ronson Ship would have stripped the old firring off, slathered more pitch and horse hair over the hull and nailed on new firring. By expending the less expensive wood they saved the hull and prolonged the life of the ship. Thus the three species of teredo worms found in the Ronson hull represent remnants from voyages made during the last two or three years of the ship's active sailing life. However, as the outer hull planking was being carefully studied caulked worm holes were discovered. The caulked holes reflect previous refirring episodes in the ship's history.

CEILING

Ceiling planking lines the inside of the frames, "sealing" them off from sight and protecting them from damage (Plate 7.7). Sir Westcott Abell believes that inner planking reflects an inherent weakness in the butt-jointed frames. The inboard/outboard planking combination was required to firm up the structure (Abell 1981:84). Whatever the single or compound reasoning behind the ceiling, it extended from the very stern throughout the amidships section and the entire bow.

Dictated by the shape of the vessel, ceiling planking started with narrow 6 inch wide, 2 inch thick, oak boards laid next to the keelson. These "limber boards" were not nailed down. Finger holes were carved into one end so they could be conveniently lifted out. The space provided sailors an easy access to the bilge.



Plate 7.7: The ceiling in the amidship section curved up the portside from the flat bottom.

Next to the limber boards four wider planks were treenailed to the frames. They began at 10 inches wide and graduated to 12.5 inches. Three 4 inch thick foot wales came next. The first was 10 inches wide. the second and third only 8 inches. These eight planks spanned the flat floor in the amidships section and followed the upward stern sweep, finally curving into the deadwood. The foot wales were not detected in the bow.

The next seven ceiling planks amidships were laid on edge against the inner curve of the frames. Like the floor ceiling strakes they began narrow, only 8 inches wide and increased to 13.5 inches. Following the curve of the hull, some ceiling planks pinched out in the diminishing stern area, others ended at the deadwood or transom. Forward of amidships the ceiling continued up into the stem rabbet. The seven bow ceiling strakes tapered to accommodate the narrow reversed curve of the hull. The "sealing" was complete, no gaps. Even in the very stern, the shipwright went to the trouble of enclosing the last frame. Short vertical boards, 1 inch thick were nailed to the frame closing off the space between the underside of the lower deck and the bottom of the frame.

The eleventh strake up, across from the main hatch and directly under the gunport had a notch cut out admitting the lower deck scupper down between the frames (Plate 7.8). A similar notch was cut out of the same strake just forward of the last gunport. In total there were three lower deck scuppers on the portside; one under each gunport.

Above the seventh ceiling plank, a 3 inch thick, 13 inch wide plank (clamp) provided a shelf for the deck beams (Plate 7.9). Eight-inch by 10 inch notches were sawn out at 4 foot intervals. Dovetailed deck beam ends rested in these openings along the clamp. The clamp ran the entire length of the hull, supporting deck beams at 4 foot intervals beginning 4 feet forward of the transom and ending 4 feet aft of the stem. Of course, this was not a single timber, but its dimensions remained constant throughout the run of the hull.

On top of the clamp sat the waterway, 6 inches wide and 3 inches thick (Plate 7.10). The waterway's inside edge was neatly rounded to mesh with the decking. Unlike the clamp it narrowed in the stern to a 3 inch by 3 inch timber and tapered away completely at the turn of the bow. The clamp/waterway combination complimented the main wale on the outside of the frames forming a thick belt around the entire hull.

Above the waterway the ceiling continued, with first a 12 inch wide plank then a 14 inch wide strake with cutouts for gunport sills. The first gunport was located directly across from the main hatch. The second port was hidden in a lot wall and the third was across from the mizzenmast.

The ceiling continued up one more strake around the port in the amidships area. Further astern, the ceiling was missing above the waterway. Just forward of the first gunport the next ceiling strake was intact and continued to the bow. The next plank up was the upper deck clamp. However, in the areas opened for excavation no complete section of this last strake was found.

Above this point the hull timbers ended, having been axed and stripped away to make room for building basements. Luckily, the upper deck beams forward of the main hatch were still in place. They occurred every four feet directly over their lower deck counterparts. The beam's ends were also dovetailed, suggesting that the upper deck clamp was identical to the clamp beneath it.

BREAST HOOKS

Breast hooks are the last massive timbers placed in the bow to tie the sides together. In the nineteenth century, breast hooks were also placed in the stern of whaling ships. Stern breast hooks can be seen today in the CHARLES MORGAN, a nineteenth century whaling ship. However, this was a special use and in most vessels of the eighteenth and nineteenth centuries breast hooks only occur in the bow.

During excavation and demantling in the bow of the Ronson Ship we uncovered two complete single-timber hooks and one composite hook (Plate 7.11). A fourth breast hook, or deck shelf fragment, was uncovered at the very top of the excavation. The two single-timber hooks were placed well above and below the lower deck. Both hooks are smaller than the complete composite hook with the lowest hook being the smallest of all. However, in comparison, the higher single-timber hook rivals the stempost in dimensions. Spanning the longest distance around the inside of the bow, the composite hook consisted of a breast plate and two adjoining knees. Behind the plate section the shipwright placed a smaller filler chock. Along the hook's top edge he carved out a ledge. The ends of the lower deck planks rested on the ledge, completing the run of the lower deck (Plate 7.12). Initially, we thought the fourth hook or shelf fragment was "ekking", a very small hook placed at the top of the bow. Later, as we uncovered more of this section, we realized it was on the same level as the upper deck and therefore too low to be ekking.

Unfortunately, the fragment is badly eroded and we cannot confidently identify whether it was a hook or a hook/shelf combination as on the lower deck. All of the hooks were secured to the hull with long iron drift pins. On the face of the top single-timber hook, directly in line with the stempost, was a large ring concretion. Although badly concreted the original dimensions of the ring were approximately 10 inches across with the ring itself being approximately 1.5 inches thick.

DECK SUPPORT STRUCTURE

Eighteenth-century vessels of the Ronson Ship's size had two and sometimes three decks, as well as a built-up structure in the stern for cabins. During excavations we found two decks on the Ronson Ship; the collapsed lower deck in the forward two-thirds of the ship, and the collapsed upper deck between the main and forward hatches. Unfortunately, the other sections of decking were removed during the initial filling period. Luckily, the deck support structure for the entire lower deck and the upper deck beams under lot walls were still intact. The intact upper deck support beams were incorporated into the foundations of nineteenth century basement floors.

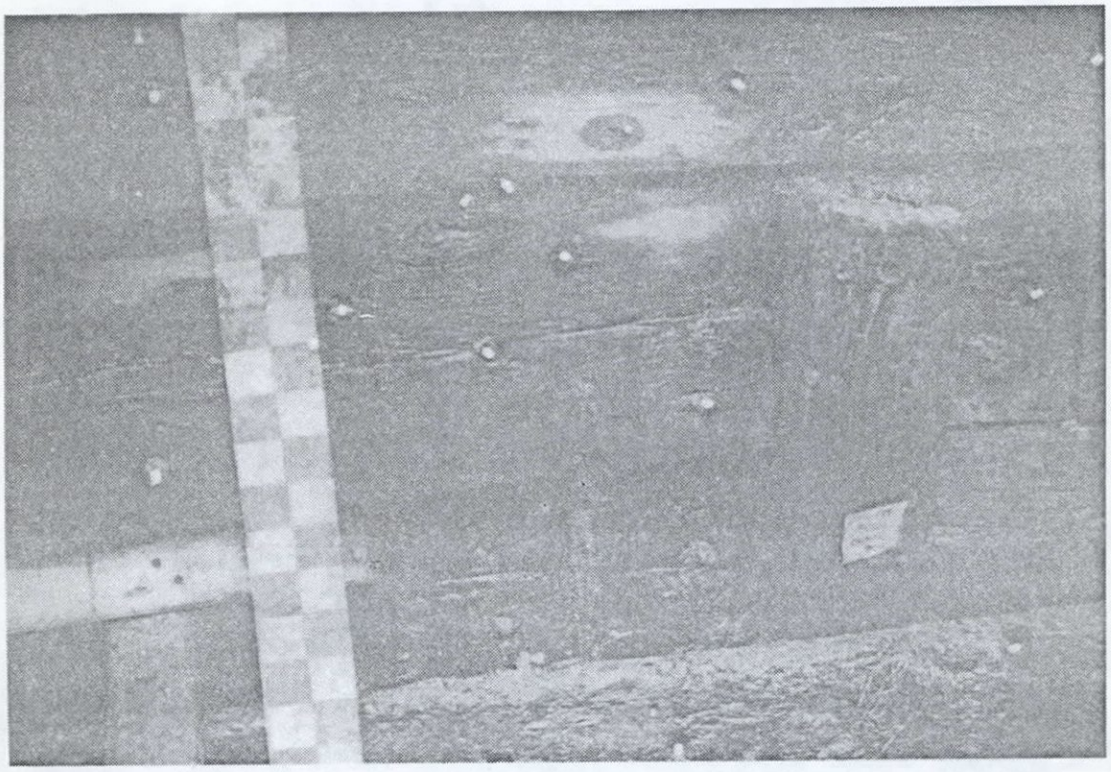


Plate 7.8: The lower deck scupper protruded from between two frames and through the deck under the gunport.

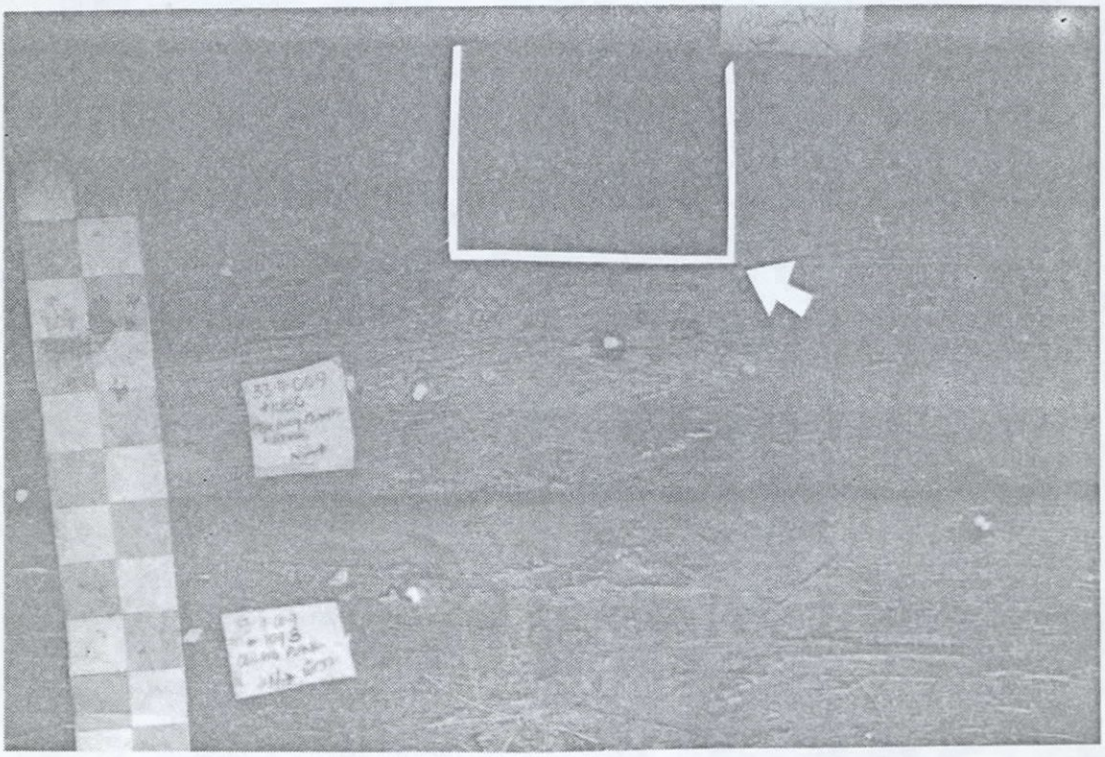


Plate 7.9: Outlined in white is a cut out in the lower deck shelf-clamp where deck beam ends rested.

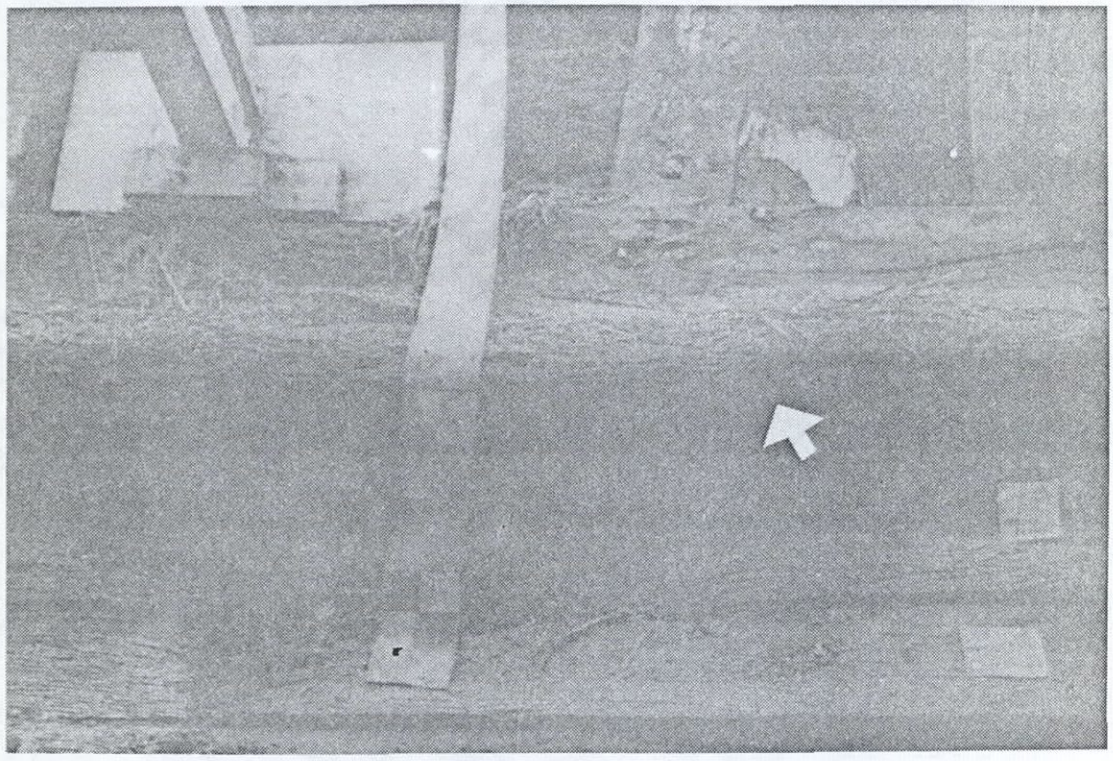


Plate 7.10: The white arrow indicates the large, hewn, lower deck waterway.

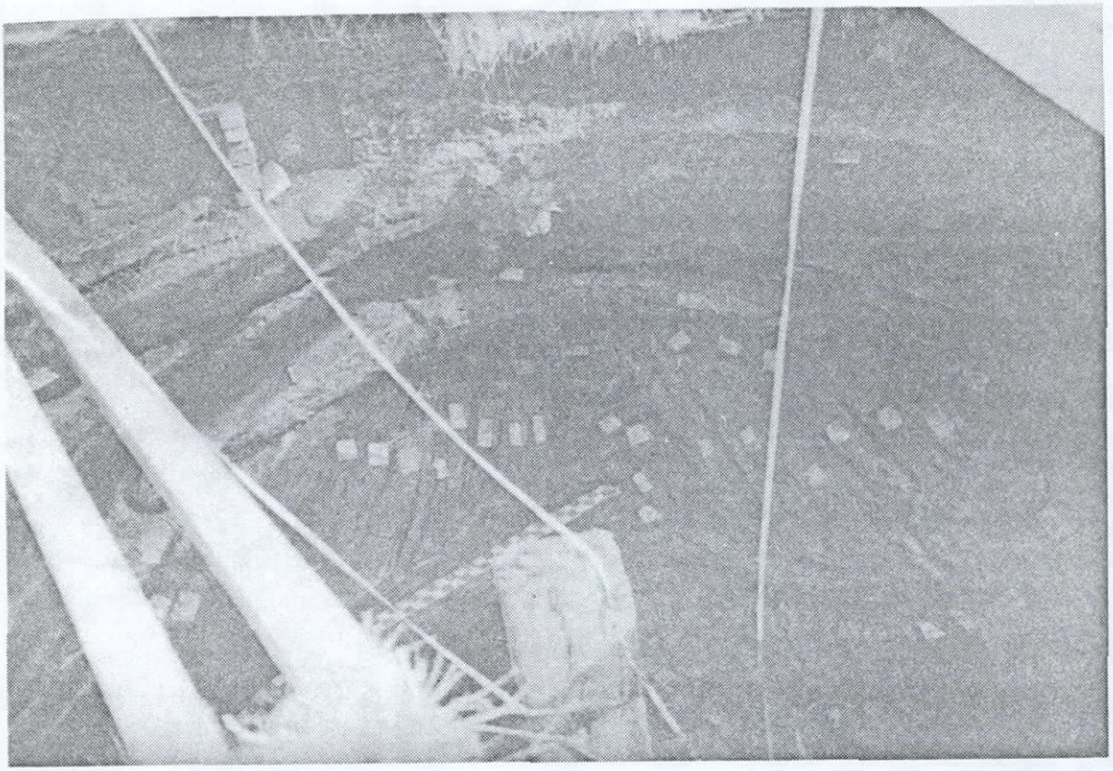


Plate 7.11: Three breast hooks (horizontal curved timbers) spanned the bluff bow.



Plate 7.12: Lower deck plank ends rested on the breast plate for support.

The enigma as to why only a very small portion of the upper deck remained may be answered by dateable cultural material in the fill and remnants of an open rock fire pit discovered on top of the extant upper deck. The fire pit suggests that Lot 32 remained an open area for some time before being built-up. Perhaps by the time construction on the lot began the deck had already collapsed and posed no inconvenience to the builder, thus it was left and filled over.

All of the deck planks rested upon 12 inch square deck beams and were fastened with square nails. These slightly bowed beams spanned the breadth of the ship and dovetailed into clamps along the hull's side. Because of their slight bow or "crown", the decks, which assumed the same curve, drained easily. The upper deck beams were braced with hanging knees (vertical natural tree L's). Treenailed to the side of the beam, the hanging knees bolted to the hull through the ceiling planking (Figure 7.6). All edges of the knees were rounded and both ends tapered to meet the underside of the deck and the side of the hull. Aft of amidships the hanging knees were forward of the deck beams. Forward of amidships the knees were on the aft side of the beams.

The lower deck beams were supported by lodge knees (horizontal tree L's) (Figure 7.7). To secure the lodge knees, the shipwright bolted them to the hull and the adjoining deck beam. Unlike the hanging knees, only the athwartship leg of the lodge knee tapered smoothly. The other leg was squared and its end cut straight. At the square end, another deck beam butted up against the lodge knee just before dovetailing into the clamp. This sequence extended along both sides of the ship forming a continuous band of thick timber inside the hull. In the same manner as the hanging knees, the lodge knees aft of amidships adjoined the deck beams on the forward side and forward of amidships on the after side.

To either side of the ship's centerline (keel) another timber, the same width as the deck beams but only 3 inches thick, ran fore-and-aft between deck beams and rested in pre-notched slots (Figure 7.7). These smaller timbers (carling) were attached with small square nails angled into the beams and notches.

Running between and parallel to the deck beams were intermediate deck beams. These were the same width and thickness as the carling and spanned the short distances between the lodge knees and carling (Figure 7.7). Like the carling they were toe-nailed into pre-notched slots. Only in two instances did the sequence of full deck beam, intermediate deck beam and fore-and-aft carling vary. The first occurred about 14 feet behind the mainmast, where a small lodge knee, tapered at both ends, butted up against the carling and deck beam. The second variation was at the main hatch where the space between deck beams matched the length of the hatch, six feet. Two intermediate deck beams ran from the hull side to the long carling running fore and aft beside the hatch. Everywhere else the deck beams crossed the hull every 4 feet. Beginning in the bow at frame R the beams continued to the stern where frame 23, the last frame in the ship, doubled as a deck beam and was notched for carling.

Besides supporting the deck planks, the deck support structure performed several other functions. In the amidships area the deck beams and carling supported deck hatches. The two hatches provided entrances onto the lower deck where the sailors berthed and into the main hold where the cargo was stored. Unable to excavate the forward hatch, we could only compare its aft edge to the main hatch located directly in front of the mainmast. The forward hatch timbers were smaller than the main hatch. Both hatches spanned the distance between two deck beams. In the case of the main hatch the distance between deck beams was 6 feet and the hatch width 5 feet, while the forward hatch probably spanned the normal 4 foot distance between deck beams and was only 3 feet wide. Raised timbers, known as "coaming", sat on top of the carling pieces (Figure 7.8). These were notched to receive a hatch covering. The hatch covers were usually in place while the ship was under sail to keep water out of the hold. Nailed inside the coaming were small thin boards or "shoes" which bore the brunt of swinging cargo during loading and offloading. Tacked on with small nails, the shoe boards could be easily replaced as needed.

On the after side of the main hatch stood a tall carved post (monkey post) (Figure 7.9). Mortised directly into the keelson and notched into the deck beam, the post extended up through both decks. Carved with opposing notches or steps, the monkey post served as a ladder for the sailors. Another monkey post stood on the after side of the forward hatch, however, it was never fully excavated.

Also built into the deck support structure were supports for the ship's masts. Mast "partners", like carling, spanned deck beams. Two adjoining partners sat directly over the keelson. On their adjoining edge complementary hemispheres were cut out. The diameter of the hole was slightly larger than the actual mast (Figure 7.10). After the mast was inserted or "stepped" into place, chocks were driven in around the mast to take up the remaining space. The tight girdle of the mast partners lent support against the wind forces straining on the yards above.

We excavated two sets of mast partners on the Ronson Ship. One set held the foremast and the second set held the mainmast. Because of previous demolition we did not find any evidence for upper deck support of the mizzenmast in the stern. There were three holes in the mainmast partners (Plate 7.13). The largest hole was for the mast, while two smaller holes held the bilge pumps stepped behind the mast on either side.

In addition to the deck beams, we uncovered several 4 inch square stanchions within the hull. All were associated with masts, bulking up the decks at these critical points of strain. The two stanchions on the port side of the mainmast were stepped into the ceiling and formed the corners for the rose box. A third stanchion also seated in ceiling planking, was located just forward of the mizzenmast step. We did not find an aft stanchion for the mizzenmast. Nor did we find any stanchions in the bow around the foremast. The bitts immediately behind the mast probably doubled as stanchions.

Once this skeletal support structure was in place the major support system of the ship was complete. Next the decks were laid, the rigging set, and finishing touches applied to the hull and cabin structures.

Figure 7.8
175 WATER STREET

The Ronson Ship
Main Hatch Coaming

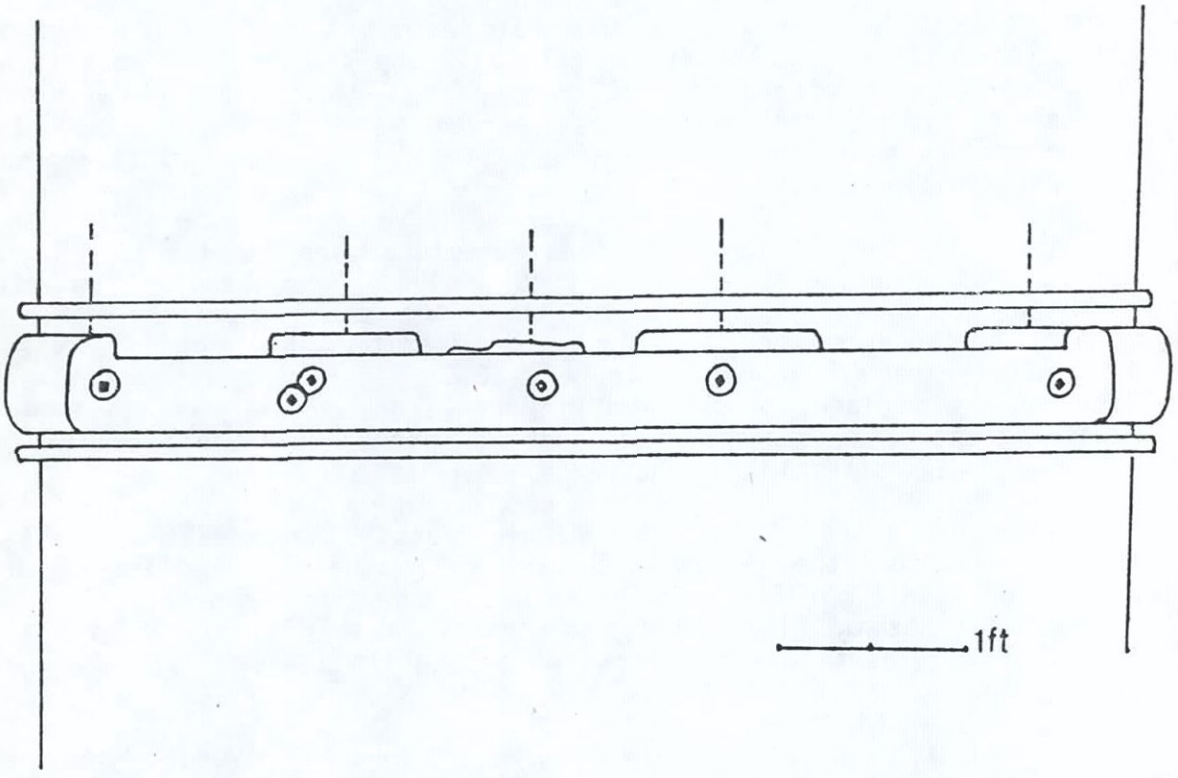


Figure 7.9
175 WATER STREET

The Ronson Ship Reconstruction, Rose Box With Mast and Bilge Pumps in Place

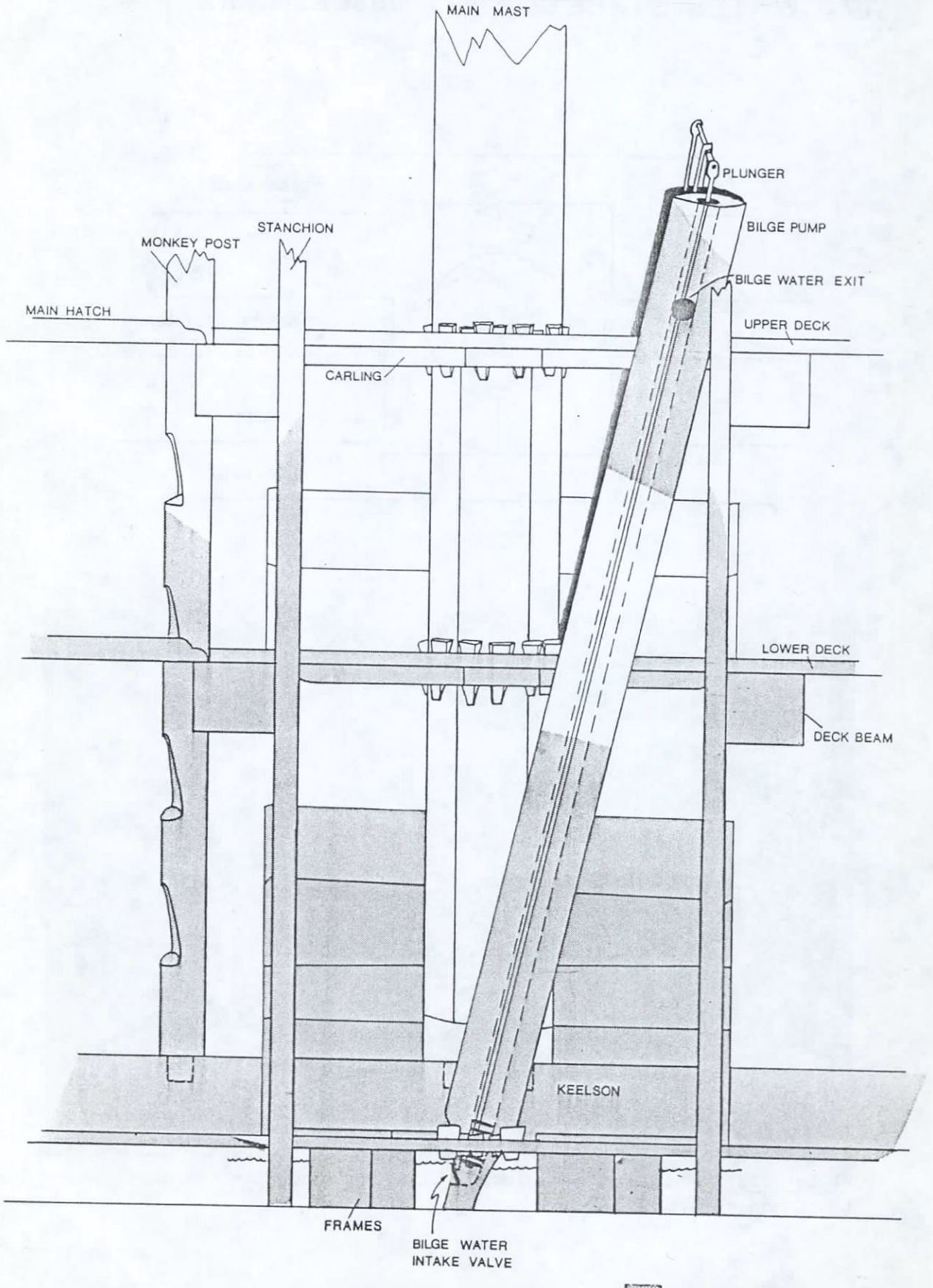
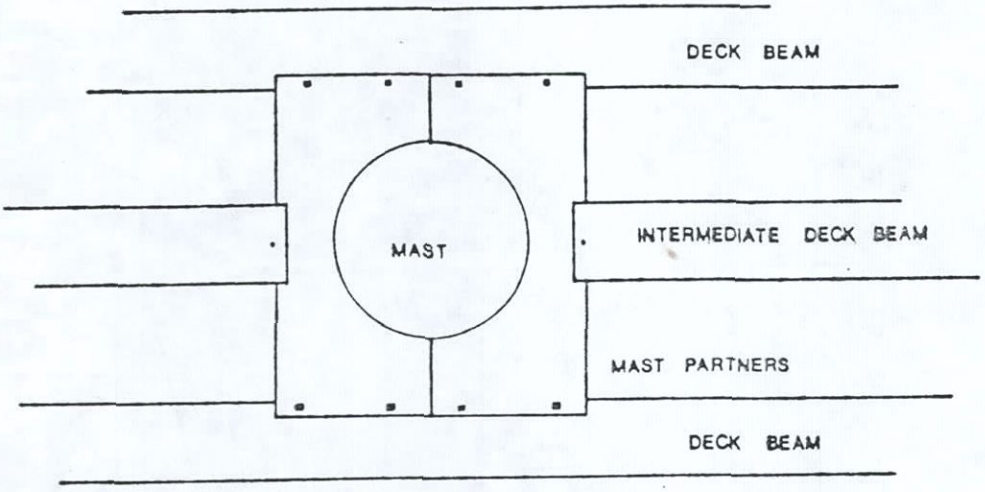


Figure 7.10
175 WATER STREET

The Ronson Ship
Mast Partners



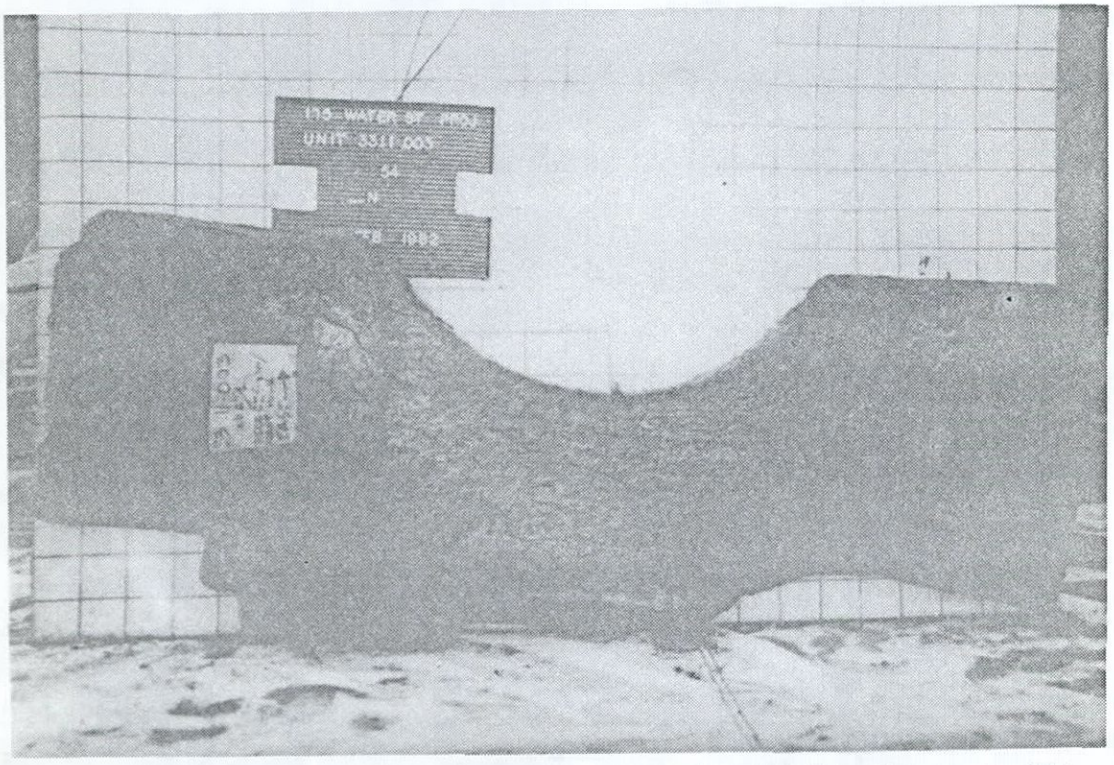


Plate 7.13: The portside mainmast partner is cut for the mast, bilge pump tube, and stanchion post.

DECK PLANKING

The amount of preserved decking on the Ronson Ship was extraordinary. Intact lower decking extended from the bow back to behind the mainmast (Plate 7.14). Extant upper decking appeared in the amidships area between hatches. The rest of the decking must have been removed when construction of the nineteenth century buildings began. Both decks were thoroughly caulked with a yellow pine pitch mixed with saw dust and hair. Upon excavation the pitch was still malleable and retained its strong pine scent.

Forward deck planks neatly followed the curve of the bow leaving no gaps in the deck (Plate 7.15). To accomplish this, the third deck strake on both the port and starboard sides narrowed to a point (nib end) while the other wider decking continued to their widths to the end. The shipwright then carved a shelf on the lower deck breast hook for the deck plank ends to rest upon. As the deck planks ran back along the hull, their numbers expanded and contracted with the hull's curve. Using different board lengths, the shipwright staggered the ends to give the deck more strength (Plate 7.16). The only exception in this pattern was next to the main hatch where a small patch of decking had been replaced (Figure 7.11). The four short boards were either a hasty patch or a later addition closing in what may have been a companionway.

Holes were cut in the decking for the masts, capstans, and stove chimney. These were done after the decking, or at least the central decking, was laid, since the strakes match up on either side of the holes. The upper decking found between the two hatches had two holes. One just aft of the forward hatch was probably for the cookstove chimney. Here an extra layer of 2 inch decking encircled the hole. The second layer of planks may have served as a fire retardant. A second hole, approximately 6 feet forward of the main hatch, still held up a capstan post. On the lower deck in the bow a large 18 inch diameter hole located the position of the foremast. Just aft of the main hatch a 25 inch diameter hole located the mainmast. A smaller 15 inch hole just to the side and aft of the mainmast marked the location of the bilge pump.

While excavating the lower deck, we discovered an odd square hole. This square cutout was directly under the gunport in the amidships area. The nibbing strake and two other deck planks were sawn out between the intermediate deck beams. At first this puzzled us. What was the advantage of sawing up only this small area and leaving the rest? Later, we discovered a drain directly underneath this hole. The boards must have been attached to a leather or lead drain funnel and therefore received special attention when the ship was stripped.

All decking on the Ronson Ship was soft wood. The deck planks have been identified as pine and the nibbing strake as red cedar (Table 7.3). The specific use of red cedar for the nibbing strake is due to its reputation for resisting rot. When water ran off the crown of the deck, it collected at the nibbing strake, then ran out the scuppers or down the lower deck scuppers. Because the nibbing strake is difficult to replace, it had to be more durable than the other decking. The care taken in making it out of cedar is another example of the quality workmanship of the builder.

Tool marks still visible upon excavation indicated the planks had been pit-sawn from axe-hewn logs. Pit-sawn boards exhibit an angled curf mark along the face, while later mechanical saws worked straight up and down. A few of the boards showed signs of being ripped from wider boards. Generally the boards ranged between 7 inch and 12 inch widths. All of the boards except the nibbing strake were 2 inches thick. The nibbing strake was an inch thicker than other deck planks, but a carved out seat in the deck beams allowed it to sit flush with the rest of the deck.

Most of the planks were nailed to the deck beams with small, quarter-inch square iron nails. These were placed in a fairly straight line along each deck beam with two nails per plank at each intersection of a beam. The nibbing strake was attached with nails and treenails. In addition to the nails holding down planks, some nail holes were found on the top side of the planks that did not extend all the way through the board. This evidence may indicate secondary use, original freighting marks, or where temporary bulkheads once stood in the ship. Only further study can clarify this information.

Another interesting feature found on the edges of many boards were small square wedges. Resembling modern day golf tees, they were driven into the plank edges. At first we thought they might be fillers where treeknots once appeared, but upon close inspection this was not the case. To date we are still baffled by their frequent appearance in all the decking.

PANELING

Overlaying the ceiling planking in the stern area, excavators discovered thin paneling. Above the lower deck tongue-and-groove paneling boards lined the hull wall (Figure 7.12). The softwood panels began just behind the mizzenmast and ran back to the stern. A 2 inch half-round molding sat on top of the waterway and ran along the bottom edge of the paneling.

Underneath the waterway similar softwood paneling lined the floor. Instead of being tongue-and-groove, these boards were laid in lapstrake fashion, with the lap ridge up and on the inside (Plate 7.18). The ridges probably provided convenient foot ledges in this narrow part of the hull. These boards continued forward under the mizzenmast then stopped abruptly. Some of the board ends showed signs of repair. Small irregular pieces of the same type of wood were shoddily patched over the ends.

BULKHEADS

Only two bulkheads (walls) were still standing when we uncovered the hull. These were in the bow on the portside. A 3 inch thick by 18 inch wide plank stood between the upper deck and lower deck. The bulkhead was oriented fore-and-aft, 3 feet in from the hull (Plate 7.17). Attached to the aft edge of the board, directly over the second deck beam, were smaller, thinner planks running athwartships. They also filled the space between decks to form a compartment.

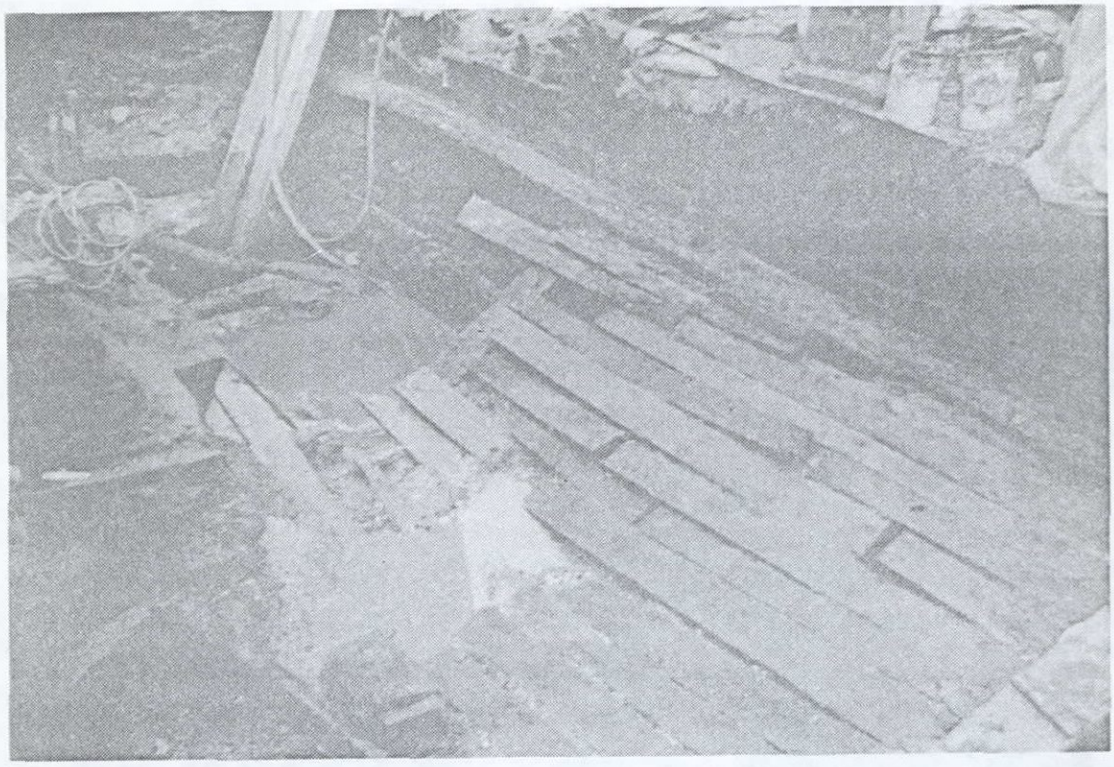


Plate 7.14: The remains of the lower deck amidships.



Plate 7.15: The remains of the lower deck in the bow.



Plate 7.16: Staggered deck planks added strength to the lower deck.

Figure 7.11
175 WATER STREET

The Ronson Ship
Plan of Lower Deck

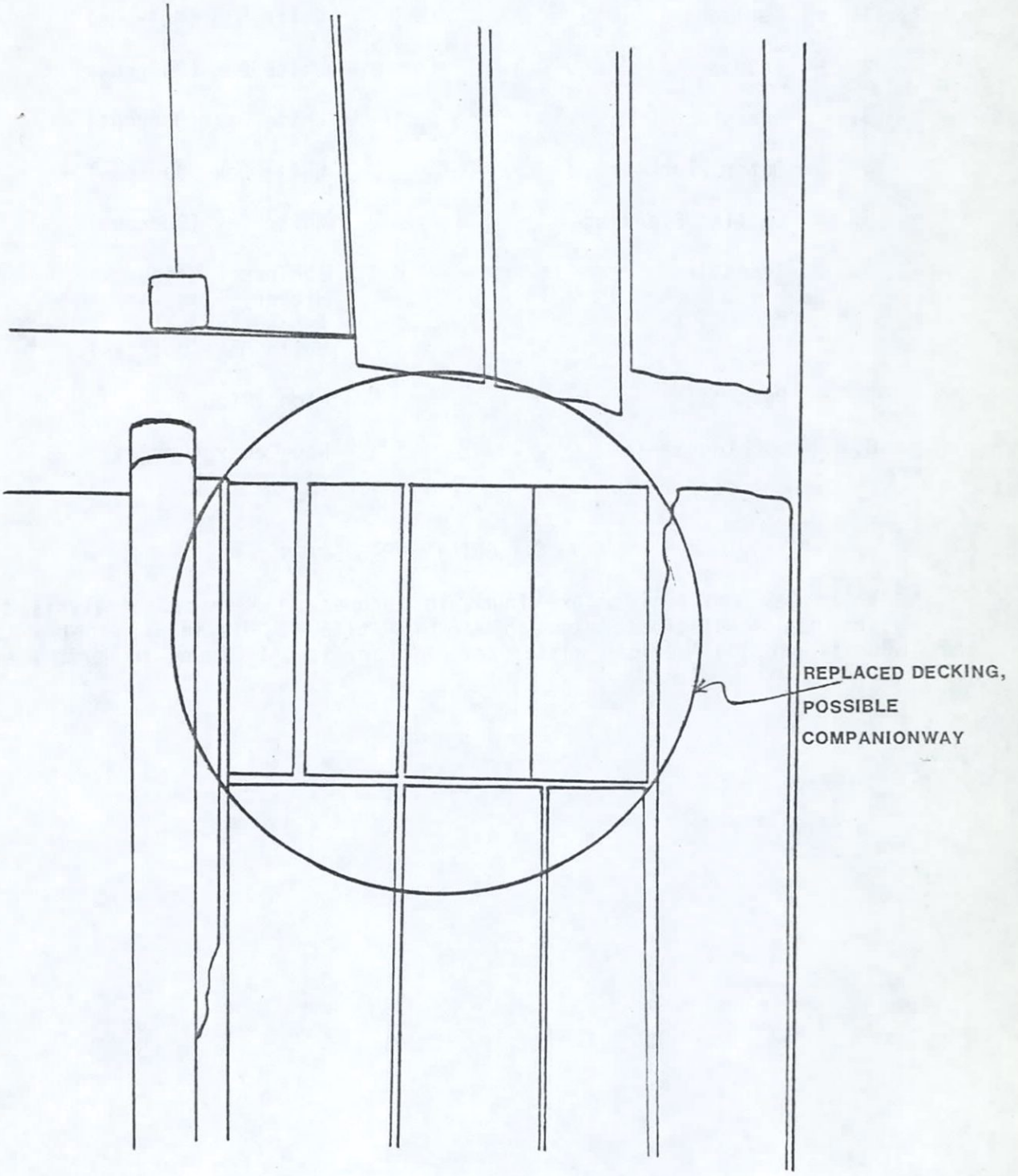


TABLE 7.3 175 WATER STREET: Wood Species

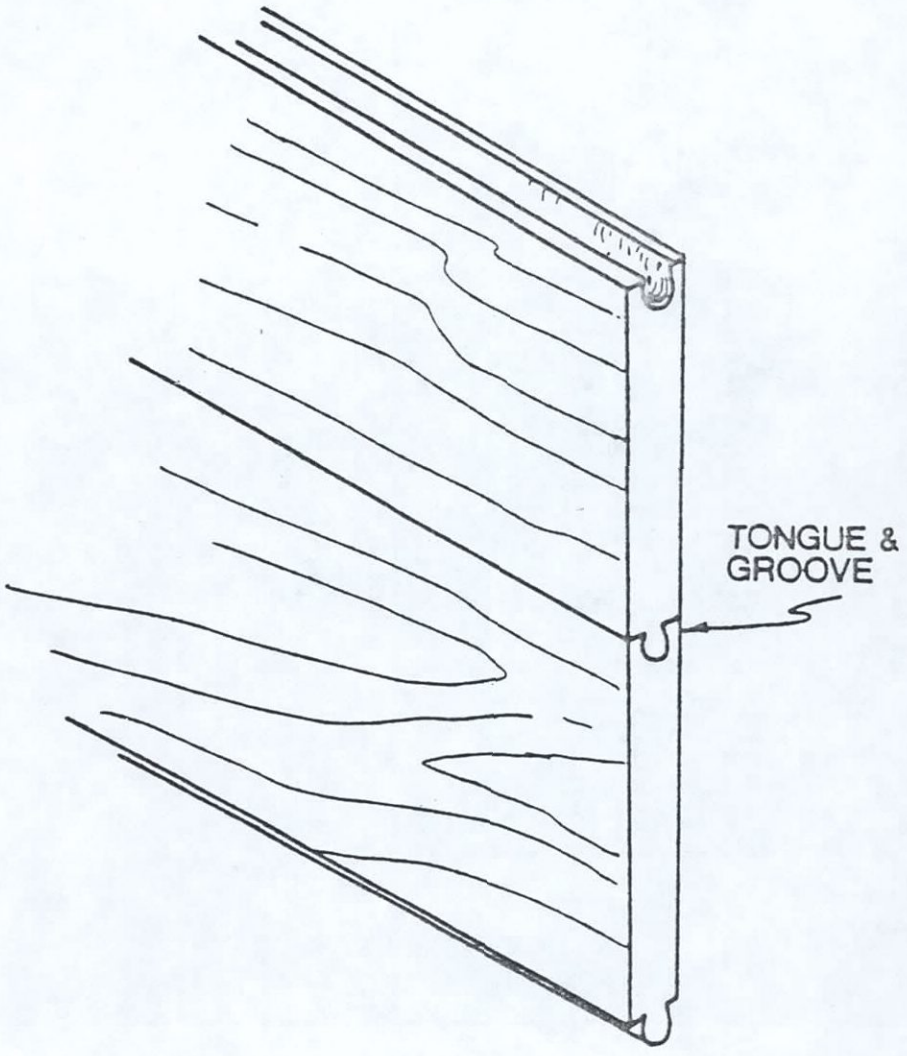
1.	Keelson	White Oak (Quercus)
2.	Frames	White Oak (Quercus)
3.	Knees	White Oak (Quercus)
4.	Outer Plankins	White Oak (Quercus)
5.	Ceiling Planking	White Oak (Quercus)
6.	Treenails	Juniper (Juniperus) Hickory (Carya) Ash (Fraxinus) White Oak (Quercus)
7.	Decking	Pine (Pinus)
8.	Nibbing Strake	Red Cedar (Cedrus)

ORIGIN OF SPECIES

White Oak and juniper are found in Europe and America. Analysis techniques are not sophisticated enough at this time to distinguish between European white oak and American white oak. Hickory is only found in North America.

Figure 7.12
175 WATER STREET

The Ronson Ship
Great Cabin Paneling



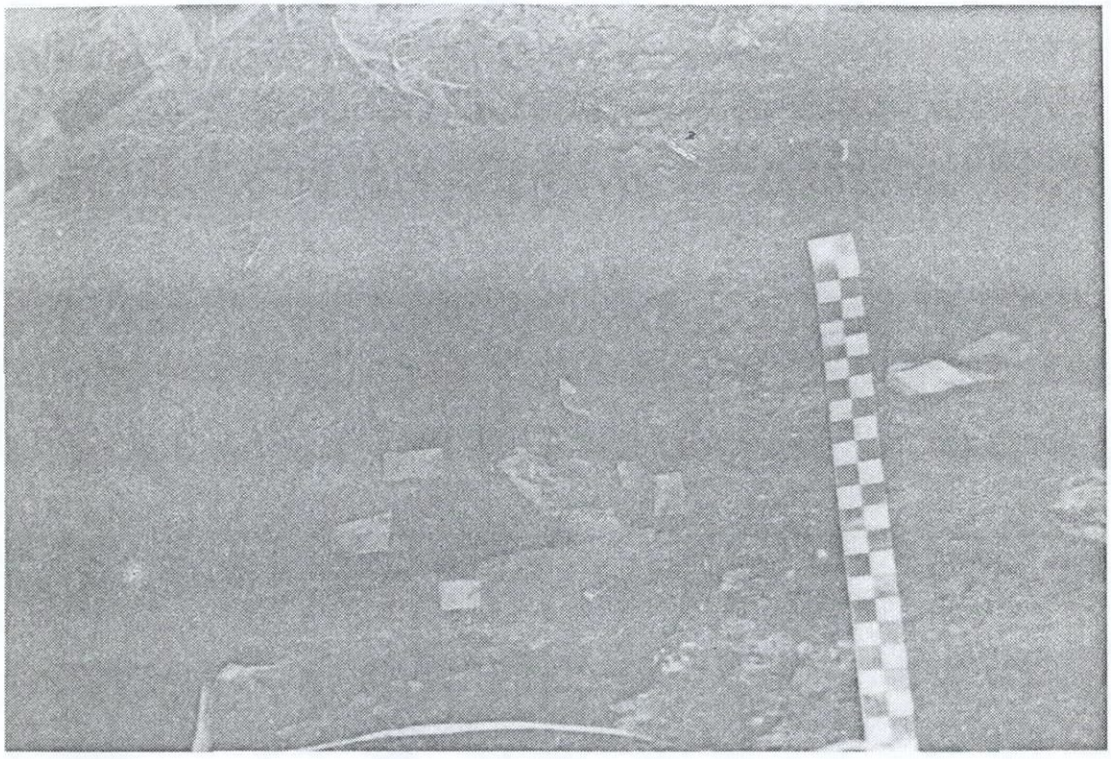


Plate 7.17: Bulkhead boards sectioned off a compartment in the bow for Bo'sun stores.

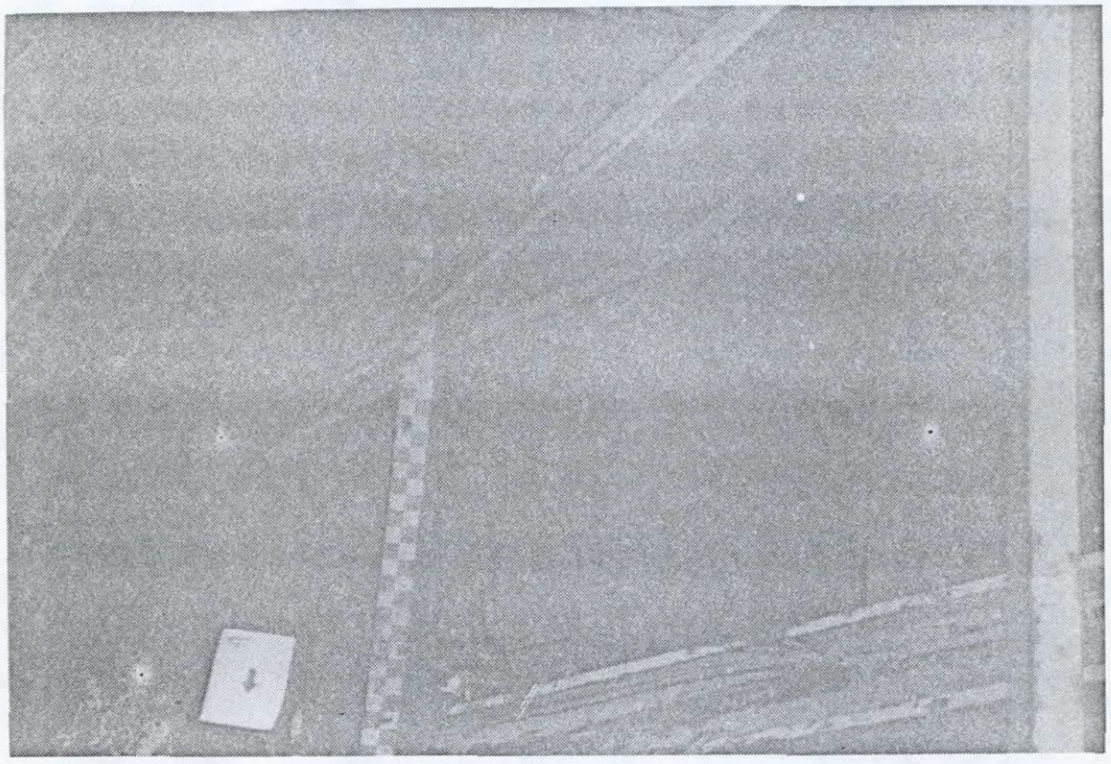


Plate 7.18: Paneling laid in lap-strake fashion lined the ceiling under the lower deck in the stern cabins.

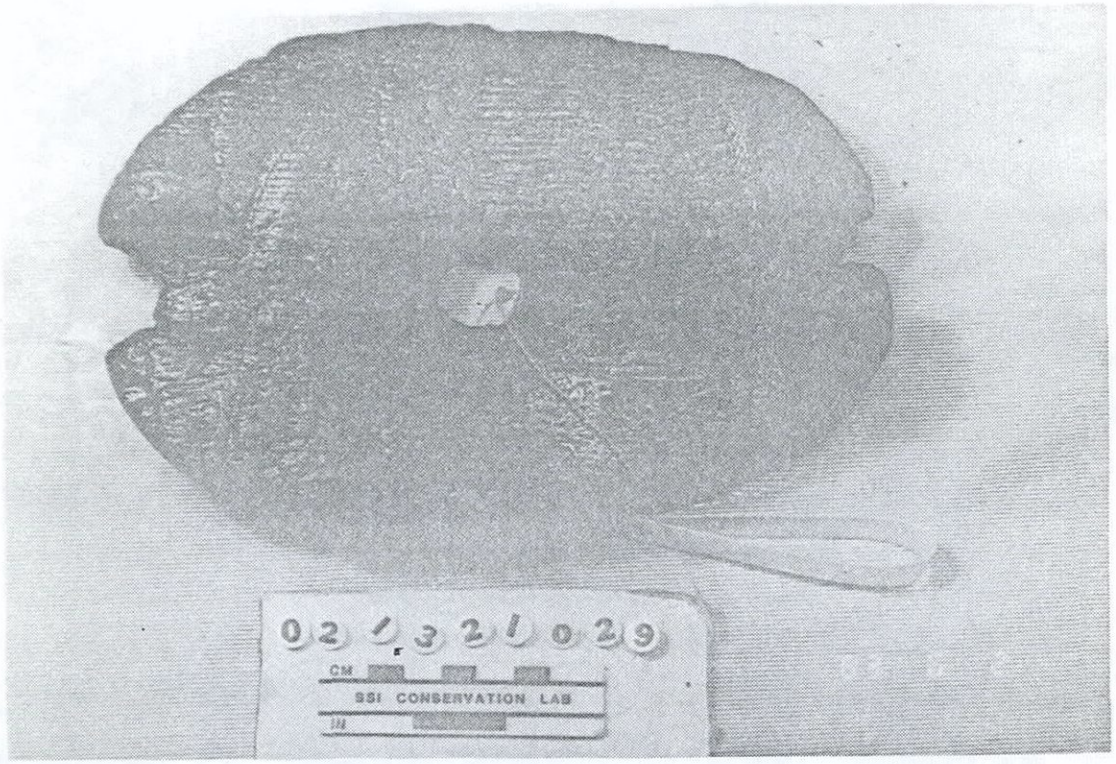


Plate 7.19: This rigging block fragment was discovered in a pine bucket packed with pine needles. The bucket sat on the lower deck within the Bo'sun compartment.

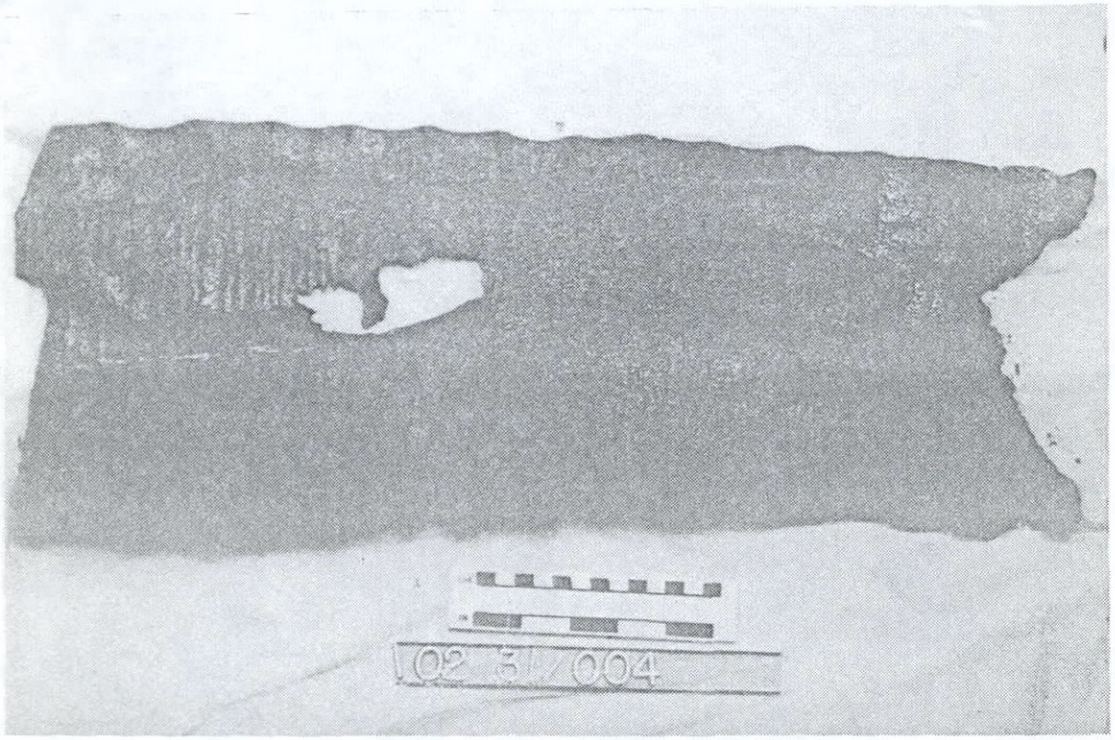
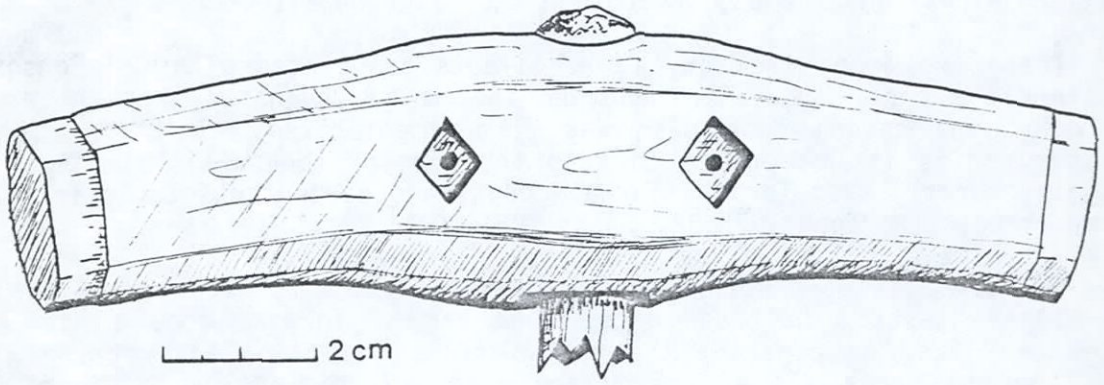


Plate 7.20: This relaxed leather arming once laced up the back, protecting a sailor's arm from chafing.

Figure 7.13
175 WATER STREET

The Ronson Ship
Caulking Mallet Head



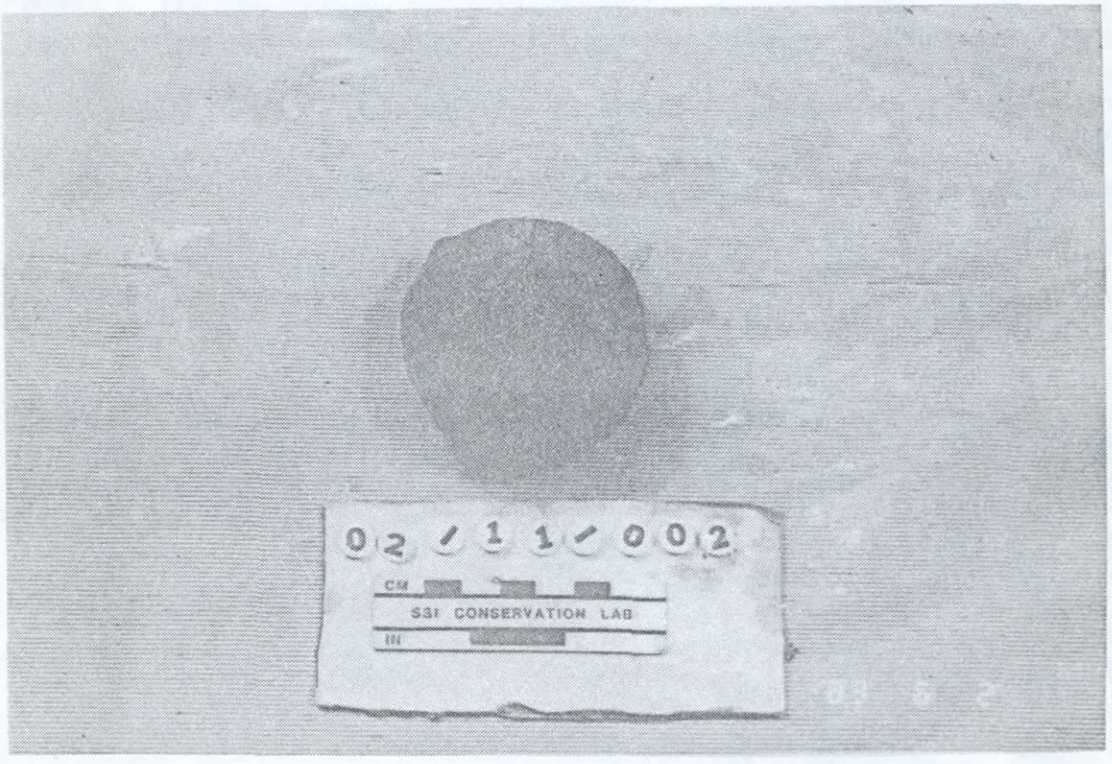


Plate 7.21: Excavators found this small cannon ball in the bow. The ball's size suggests small maneuverable guns were mounted above decks in the bow.

This small compartment may have been used as a rope locker. Its proximity to the bow and forwardmost capstan lend support to this theory. Outside the bulkhead on the lower deck, the bow excavation crew discovered a bucket filled with pine needles and a partial block (Plate 7.19). On the starboard side of the lower deck in the same area, a caulking mallet head (Figure 7.13) and leather armings (Plate 7.20) were uncovered. Later, during the bow dismantling a small cannon ball (Plate 7.21) was discovered among the portside ceiling planks and frames, underneath the lower deck locker.

These are among the very few artifacts associated with the Ronson Ship. Their close proximity to one another in the bow suggests that the area forward of the second deck beam was compartmentalized. In later eighteenth century ships it was common to keep the "bosun" (boatswain's) stores (extra rigging parts), shot for the forward guns, and carpenter's tools in small bow compartments (Nordbok 1975:32, Smith 1981:104).

No bulkheads were found in the stern, but the paneling found lining the ceiling suggests a bulkhead once stood at the forward edge of the boards. The care taken in paneling the hull's sides and floor indicates a specific use for this area aft of the mizzen mast. Traditionally, officers berthed aft and sailors swung their hammocks forward. Also, in this area certain ship stores such as liquor and specialties for the officers or mates were kept. A second empty wooden tub was found resting on the paneled floor in the stern. Its presence, suggests that indeed this was a storage area.

All other traces of bulkheads were gone by the time we excavated the Ronson Ship. Bulkheads were often temporary structures, nailed up as needed and just as quickly taken down or moved around. The few remnants left in the bow and stern reflect the efficient use of space aboard ships. Compartments were relegated to those areas not fit to carry cargo, such as the bow and stern.

THE ROSE BOX

On most vessels a box was built around the bilge pumps and mainmast to protect them. Sailors christened this structure the rose box because of the vile smelling bilge water.

On the Ronson Ship, four stanchions were set into ceiling planks around the mainmast (Figure 7.14). They extended up through the lower deck and possibly the upper deck. One-inch thick boards were nailed to the posts, creating an enclosed box. A space was left just under the deck large enough for a small boy to climb through in case the bilge needed unclogging (Figure 7.09). All the boards were lightly tacked on with only one or two small square nails at each end.

Unlike the precise carpentry on the rest of the ship, the rose box boards were cut unevenly and didn't always match at the corners. The same type of sloppy rose box construction has been noted on other ships of the same century. Excavators recovered the rose box from the DEFENCE, a small bris sunk in 1779. The boards were also uneven and showed signs of secondary use (Blaine, 1979:5). Dismantled and rebuilt many times during the career of the Ronson Ship, the rose box was one of the few examples of temporary structures left standing after the initial stripping of the hull.

MASTS

The Ronson Ship was "ship" rigged. This means there were three masts: foremast, mainmast, and mizzenmast, positioned along the centerline of her hull. Each carried several cross spars from which unfurled voluminous square canvas sails.

A fully rigged three-masted ship may have carried as many as six cross spars on her foremast and mainmast. The mizzenmast may have supported up to five cross spars as well as a small fore-aft spanker sail. The more sails a master could rig on his ship the less crew he needed to sail her. Small sails needed fewer hands in hoisting, whereas, many men were needed to hoist one very large sail. By decreasing the sail area per sail the captain could decrease the number of hands and increase the space for money-making cargo.

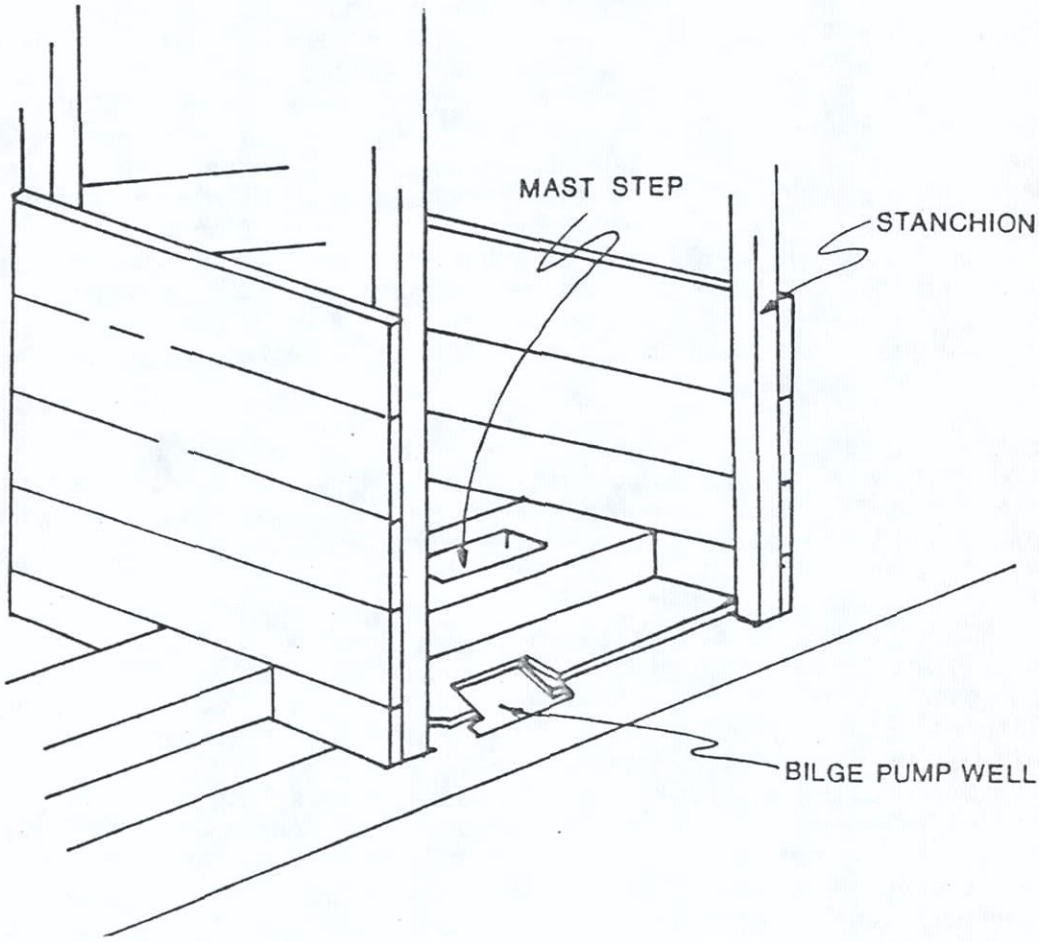
Unfortunately, only a small fragment of the mizzenmast remains of the Ronson Ship mast spars. Both the foremast and mainmast had been unshipped. However, we can still find the location and dimensions of the masts by studying the position and diameter of the mast holes in the lower deck and their mortises in the keelson.

The foremast hole in the lower deck was located only 4 feet behind the stem post, placing the mast quite far forward. A diameter of 18 inches was taken from the mast partners. This dimension was slightly larger than the mast itself, to allow for steeping the mast, unshipping, and chocking the mast in place.

Three and a half feet below the lower deck mast partners was a rectangular mortice cut crosswise in a large natural step. A complementary tenon was once carved at the base of the foremast. Unfortunately, liberally slathered caulking and a few splinters were all that remained for the former join. The step, hewn from a tree trunk, ran fore-and-aft, narrowed, and curved up following the rise of the stem and keelson at its forward end. It widened as it ran aft, straddling the keelson. Because of excavation limitations, we did not find the aft end of the piece. However, when we removed the step just forward of the Sampson post, the step's width was still on the increase, suggesting that it also provided a step for the Sampson post and possibly the riding bitts.

Figure 7.14
175 WATER STREET

The Ronson Ship
Rose Box



Just aft of the main hatch on the lower deck, a 25 inch diameter hole was uncovered, its center in direct line with the monkey post. Two stanchions marked the port corners of the mast partners and the rose box. Twelve feet below a 7 inch by 4 inch by 4 inch mortise was cut lengthwise in the 12 inch square keelson. Again, as in the bow we only found caulking and splinters at the bottom of the mortise. No other step pieces were located in the rose box. The adjacent bilge pump well seems to rule out that any step chocks were ever present.

In the stern on top of the lower deck sat a large timber. Its position in the eastern wall of the excavation never allowed us to study it fully, but the presence of a stanchion just forward of the piece in conjunciton with the only centrally located lodge knee positioned at the juncture of the central carling, deckbeam, and stanchion all suggest a bolstering of the deck in this area. Increased bearing capacity and the large uncommon timbers' presence point to a step for the mizzenmast.

Much later, during the demolition of the site the small mast fragment we recovered was pulled from approximately the same location as the surmised mizzenmast step. Its tenon size and small diameter support our assumption that it is indeed the mizzenmast stump.

Extrapolating from the stump and the splinters we found in the mortises, we can recreate an accurate image of what the foremast and mainmast looked like. The splinters and the stump were all soft white pine. This was expected since white pine is renowned for its straight tall growth and elastic nature, all the elements needed for a mast spar.

By the turn of the eighteenth century, the American colonies were major producers of mast spars of their own shipwrights as well as those abroad (Carroll 1973:131). Therefore it is not surprising to find white pine mast aboard the Ronson Ship.

Iron stains and an impresssion around the mast stump reflect the 8 inch iron band that once encircled the mast's base. Similar evidence has been noted on masts recovered from another eighteenth century ship, the DEFENCE (Wyman 1981:94). Above the band the stump is faceted into an octagon. This made chocking easier at the mast/deck junction. Faceting mast spars remained a common practice until the end of the wooden ship era. All of the mast of the USS CONSTITUTION, the famous Revolutionary War frigate, and those on the CHARLES MORGAN, a late nineteenth century whaler, are octagonal below decks and rounded smooth above the upper deck.

After steeping the masts, wooden wedges were driven in around them at each deck level. Slight impressions of the wedges could still be seen in the mast partners. Usually, a wooden gasket encircled the mast on the upper deck preventing water from spilling down into the hold.

Unable to excavate outside the hull, we did not recover any chain plates. Chain plates hold the stays which laterally steady the mast aloft. They are normally located between the central or main wale and the upper or channel wale on the outside of the hull. During demolition of the hull we noticed a large timber with square mortises cut along its length (Plate 7.22). We are unsure of its original location but it may be part of the chain plating from the portside.

Little else can be reconstructed of the Ronson Ship's rigging structure without more evidence. Many rigging parts were found in the fill of the ship but few were likely associated with the Ronson Ship. Only a partial block cheek found in a bucket in the bow remained of the rigging after the ship's final stripping. Other block cheeks, block keys, sheaves, and parrals were part of the ship's complement, but most of these finds were not specifically part of the Ronson Ship's rigging. Any further rigging reconstruction will have to be based on contemporary eighteenth century illustrations.

BILGE PUMPS

Bilge pumps are used to pump the water that has collected between the frames, underneath the ceiling planks, up and out of the ship. They are placed at the lowest point in the hull. Sometimes this is forward of the mainmast, sometimes aft. Most pump cylinders were hollowed out tree trunks with an access hole near the bottom and an exit hole a few feet below the top of the log. The mechanisms used to pull up the water varied.

On the Ronson Ship only fragmented sections of the bilge pumps were found. A piece from the upper portion of the port pump was found on its side on top of the upper deck. Axe marks clearly defined where ship dismantlers hacked it off. Luckily the exit hole and the diameter of the central hole wre still intact. The pump log was stripped of bark and slightly larger than 12 inches in diameter. A 4.5 inch round hole was drilled through its heart wood. Two feet-eight inches from the pump top a 2.5 inch hole was drilled through the side wall to meet the central shaft. A slightly larger square was chiseled out around the hole. No other distinguishing marks could be identified (Fig. 7.15). This piece was kept for conservation.

Later, after the construction company backhoe began to demolish the site, a portion of the starboard pump was found. Seen only briefly as it flew through the air, very few observations could be made. It was the bottom 12 feet of the pump tube. Like the fragment recovered earlier it was about 12 inches in diameter. The bottom 15 inches curved to a lopsided point like a quill pen. Approximately 12 inches from the bottom a 3 inch to 4 inch hole was drilled into the log's curving face. No hole was visisble on the other side. This hole was probably the intake hole for the foot of the pump. Figure 7.09 illustrates where the two fragments would have fit along the pump tube. The illustration also decribes the known slant of the pumps.

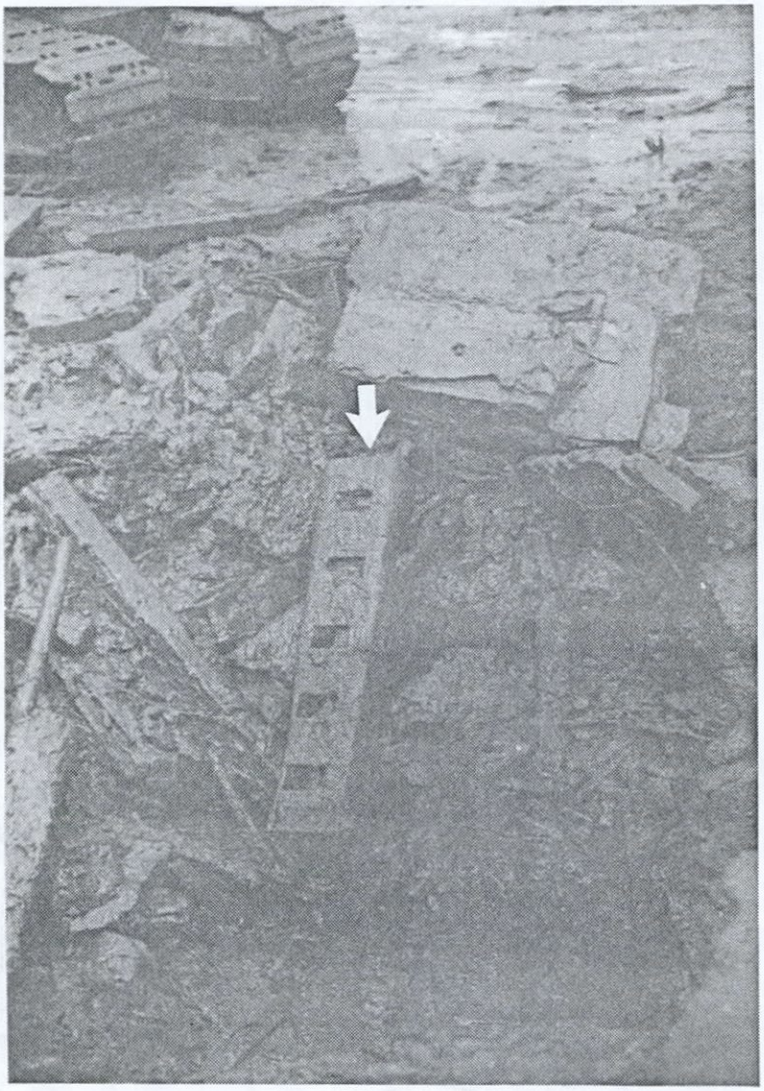
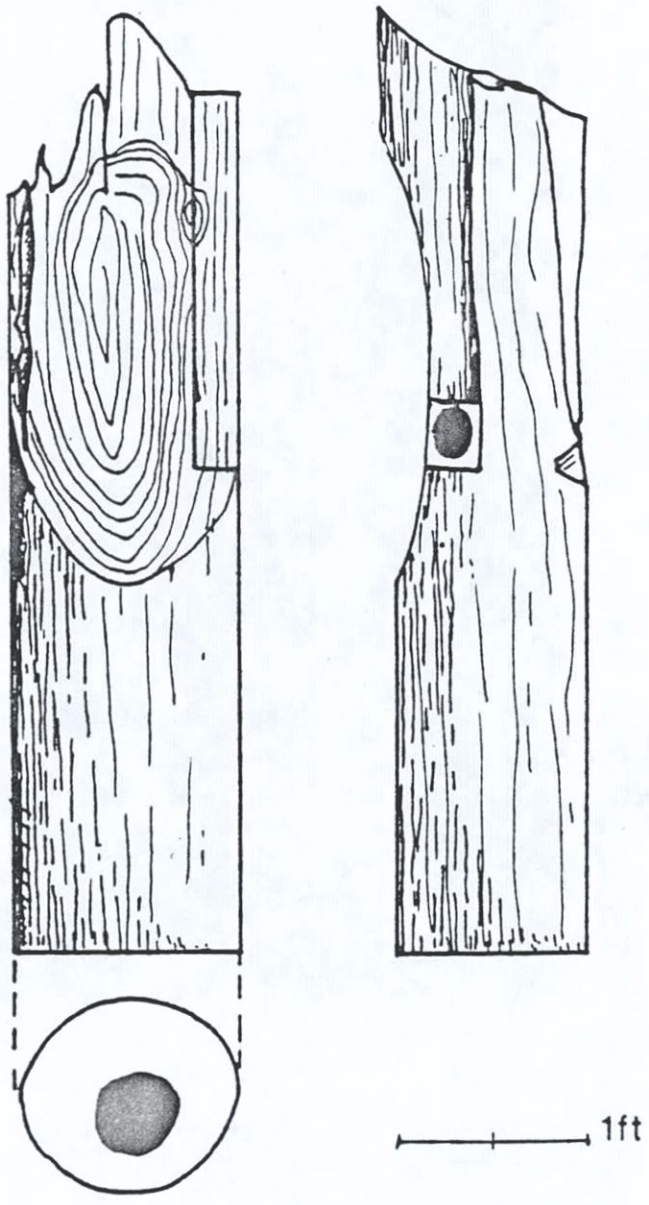


Plate 7.22: A possible chain plate piece (arrow) was dislodged during the final demolition of the site.

Figure 7.15
175 WATER STREET

The Ronson Ship
Bilge Pump Remains



On the lower deck the hole for the port bilge pump was cut in the extreme port stern corner of the rose box, while the well for the foot of the pump was directly beside the mainmast mortise on the keelson. If the pump hadn't canted backwards, the mainmast would have obstructed the pump mechanism. The slant of the pump tubes placed the tops of the pumps behind the mast and provided the needed clearance for the pump mechanism to work efficiently.

CAPSTANS

Among the striking features of the Ronson Ship was the number and placement of capstans. Used along, or in combination, with a windless they save sailors a mechanical advantage when hauling in anchor cables or hoisting up sails.

One complete capstan, one partial capstan, and possibly three capstan steps were discovered on the Ronson Ship. All three steps were found on the lower deck. They graduated in size with the sternmost step being the largest. Each was carved from large pieces of wood; one was a single piece, two were composite in construction (Plate 7.23). Generally rectangular in shape, all the exposed edges were rounded. Four large spiles, one in each corner, held the steps to the deck. A 5 inch to 7 inch hole was carved in the center of each of the top faces. Drill bitts were not large enough to make such a bore so the shipwright drilled several smaller holes around the desired diameter, then chiseled out the remaining wood. The step hole was filled with pitch, grease, and horse hair before each capstan's shaft was mounted. The packing decreased the friction allowing the capstan to turn easily. The amidships capstan shaft was surrounded by thin curved boards. They followed the post up through the upper deck. These boards must have served as an encasement for the capstan to protect it from battering and chaffing.

Above the upper deck the capstans had wings treenailed around their shafts, giving them a tiered christmas tree apppearance. Small wooden bridges connected the wings to one another. Above the wings were two offset square holes one above the other (Fig. 7.16). Sailors inserted handspikes into the square holes, then took a turn of rope around the capstan and began walking around, turning the capstan and hauling in the line. The wet rope expanded into the valleys between the flared wings, tighting its grip on the capstan (Fig. 7.17). As sailors hauled in the line, small boys stowed it in rope lockers below deck.

By using two or all three of the capstans at once, the work of the sailors was lessened. The capstans were positioned along the central axis of the ship, near the masts and hatches which required their service. The forwardmost capstan stood just before the foremast and served the lines for the anchors, bowsprit, and foremast (Plate 7.24). The amidships capstan, placed between hatches, backed up the forward and aft capstan, as well as helped haul cargo in and out of the hold. Stepped at frame 10 behind the mainmast, the aft capstan hauled lines from both the mainmast and mizzenmast.

Capstans usually backed up a large windlass seated on the upper deck in the bow. However, we were unable to detect any evidence locating the windlass position. The close quarters of the foremast, capstan, and bowsprit suggest either that the Ronson Ship did not have a windlass or that it was positioned above the bowsprit in the foremost bow.

BITTS

Immediately aft and supporting the second deck beam in the bow, we uncovered three large posts (Plate 7.25). The largest was stepped on the central axis of the ship in direct line with the stem. Two smaller posts were stepped to either side. The center post is called the "sampson" or "king" post. The flanking posts are referred to as "riding bitts." Although the full height of the posts was not preserved, similar examples are known. Originally the bitts extended up through both decks. Large dowel arms probably protruded from the post sides. Around the arms sailors made fast the large hawse lines of the anchors or moorings.

On the forward face of each bitt a shelf was carved. The two riding bitts' shelves were carved to receive the lower edge of the second deck beam while the sampson post's shelf was carved in reverse to cap the deck beam. As mentioned earlier in the section on deck support structure, the riding bitts probably doubled as support stanchions for the foremast. Their proximity to the foremast, and added support of the deck beam that held the foremast partners, suggests this conclusion is correct. Furthermore, the bitts and foremast appeared to be all mortised into the same large step. The foremast mortise was less than 2 feet in front of the bitts and although we were not able to remove the entire step, it did appear to continue increasing in width after the mast mortise.

The forward shape of the step suggests a large saddle step sat over the keelson and accepted the foot of the foremast, as well as the tenons of all three bitt posts. A saddle step would have relieved the strain on the keelson at its very forward end. Frequent use of the bitts must have strained the step but the foresighted shipwright distributed their strain by clamping them onto the second deck beam. Thus their strain would have been evenly distributed on either side of the hull.

GUNPORTS

Three gunports were located along the portside hull during excavation and later during the demolition of the site. All the ports were located in the after half of the ship. The forwardmost gunport was placed directly opposite the main hatch. Of the three ports we saw, this was the lowest in the hull and most complete. The port opening was between frames 3 and 4. No vertical dimension for the port remained. Two sills formed the base of the port. The first was placed 12 inches above the waterway. Four inches higher, the second sill spanned the 18 inch port opening (Fig. 7.18). Both sills were 4 inches square; neither was flush with the surrounding ceiling planks. The top sill abutted a large chock that covered the tops of the two futtocks and outer planking.

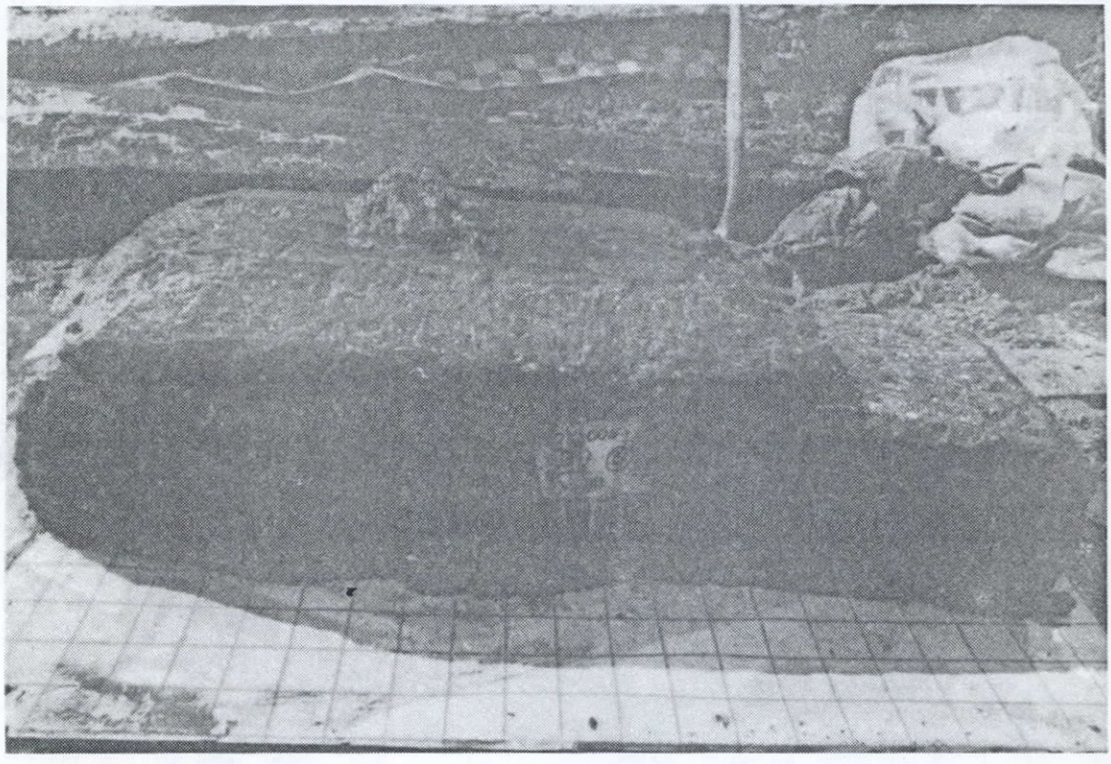
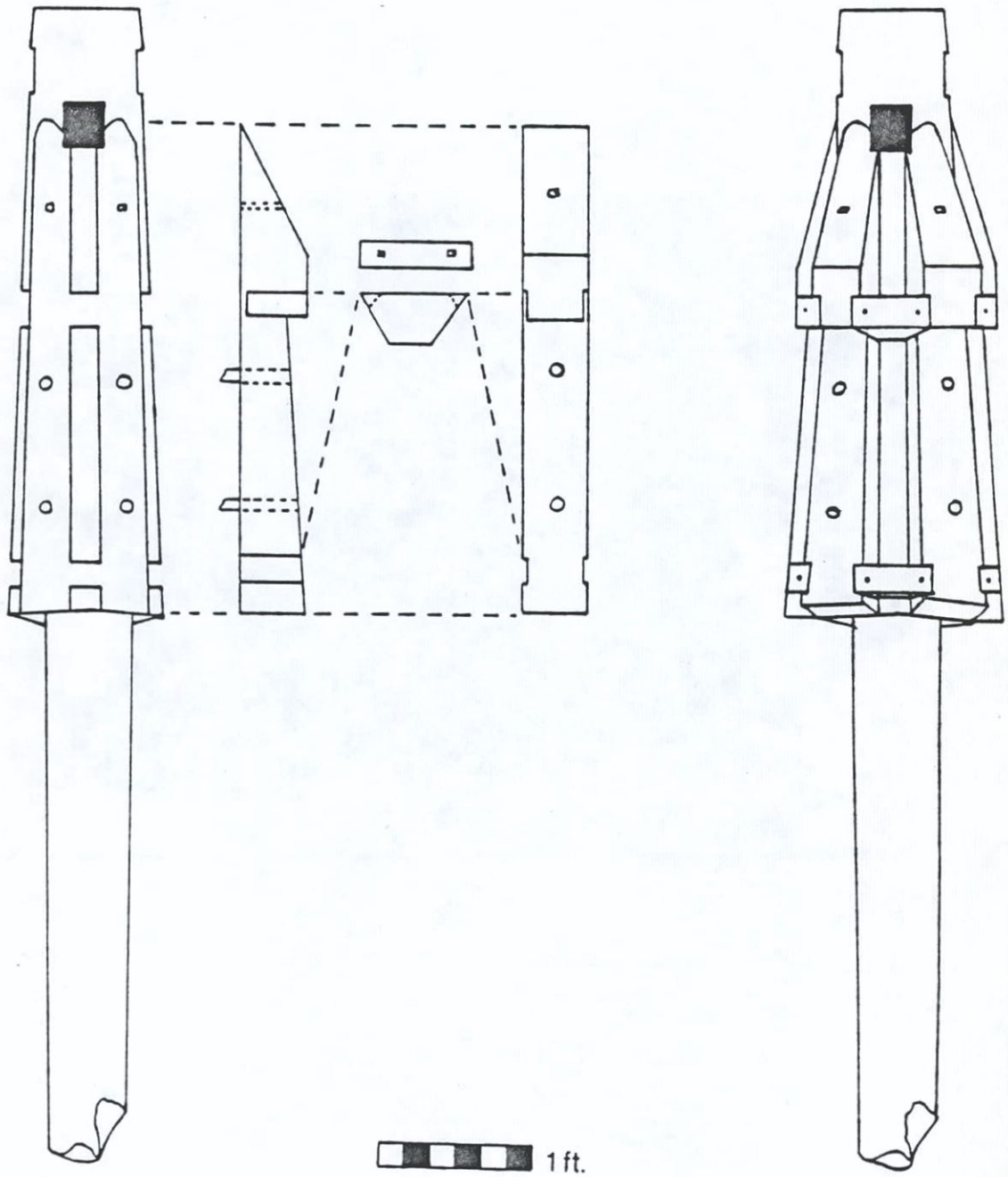


Plate 7.23: A capstan step with the stub of a capstan still protruding.

Figure 7.16
175 WATER STREET

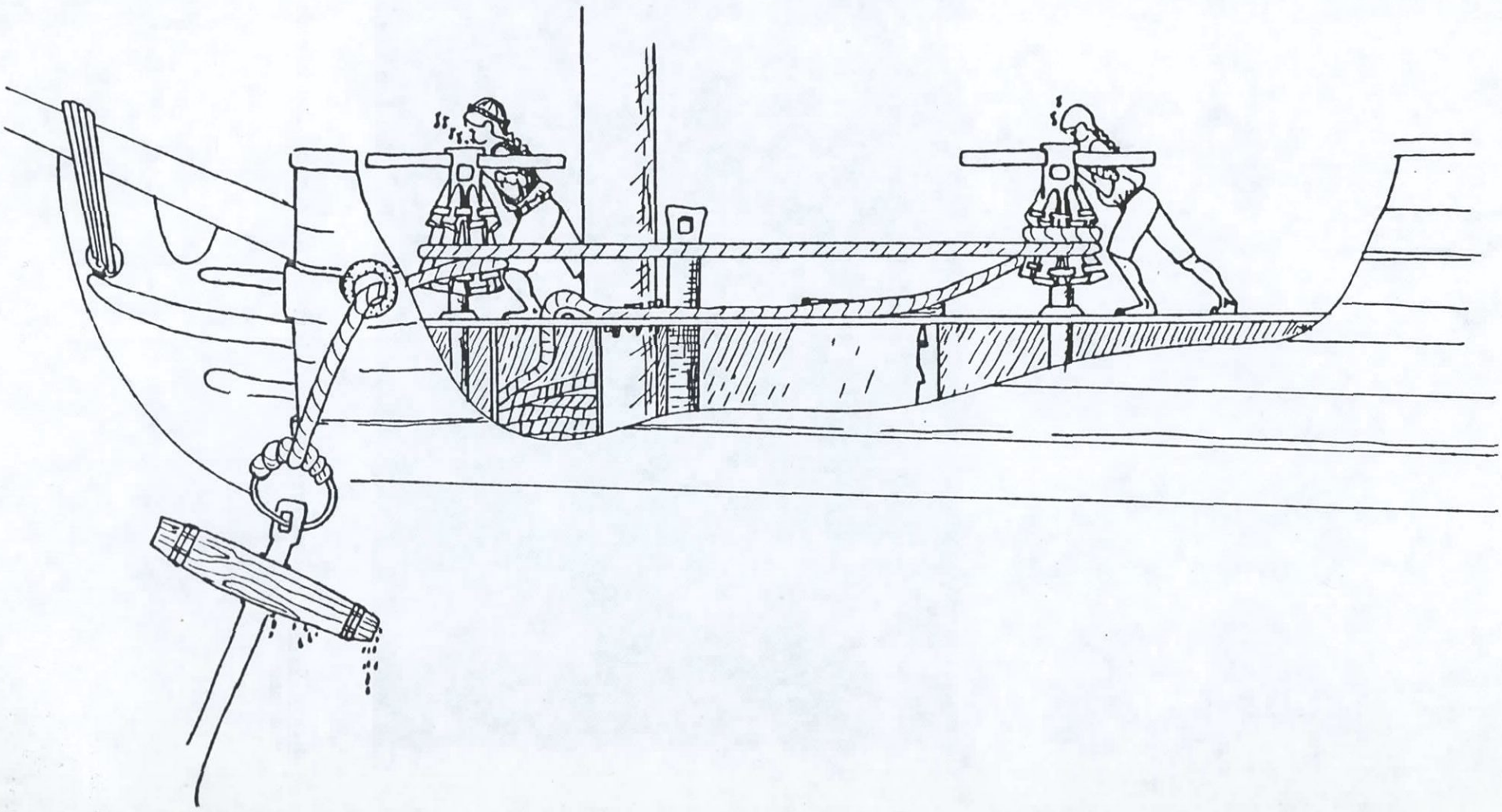
The Ronson Ship
Capstan, Lot 31



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Figure 7.17
175 WATER STREET

The Ronson Ship
Cartoon of Capstan in Use



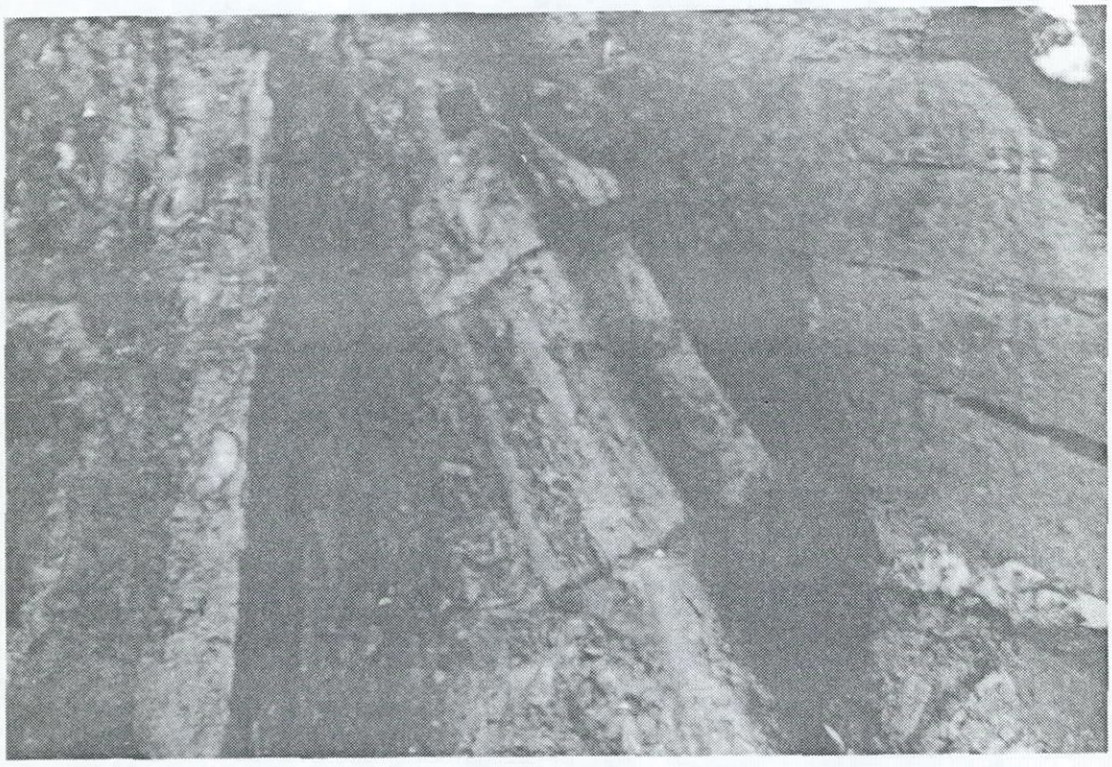


Plate 7.24: A complete capstan (center of photo) lay beside its step in the bow.

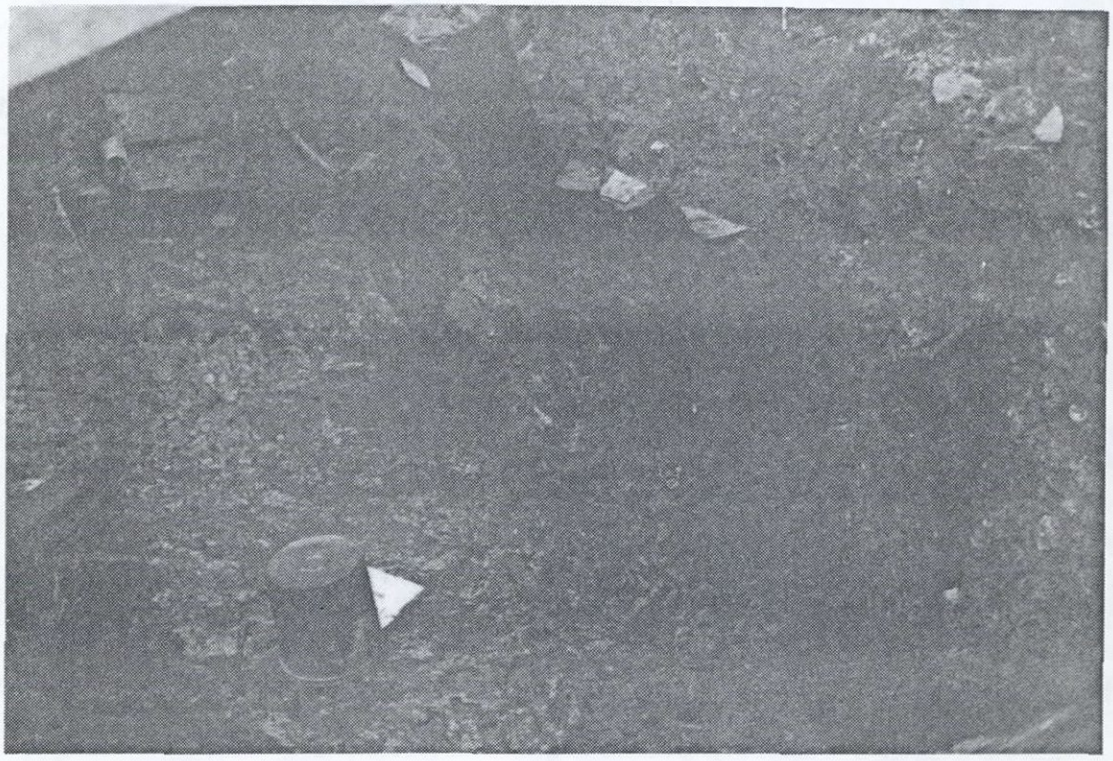


Plate 7.25: The sampson post and riding bitts (upper central portion of photo) doubled as deck supports.

Figure 7.18
175 WATER STREET

The Ronson Ship
Port Gunport

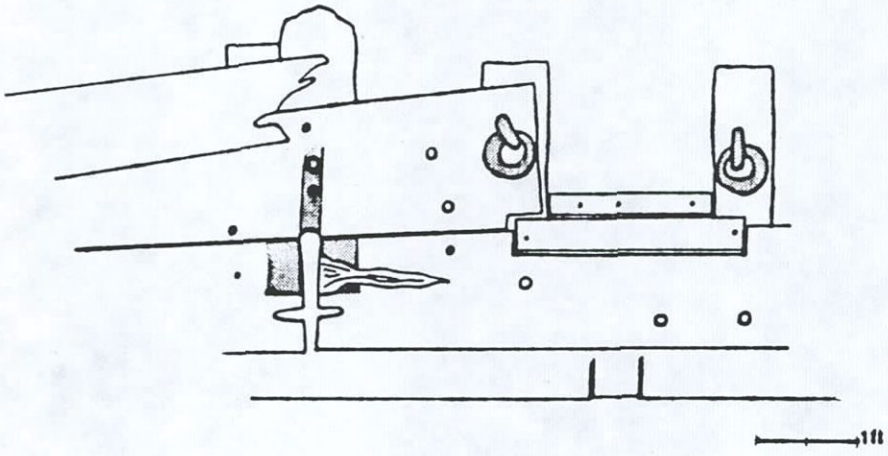
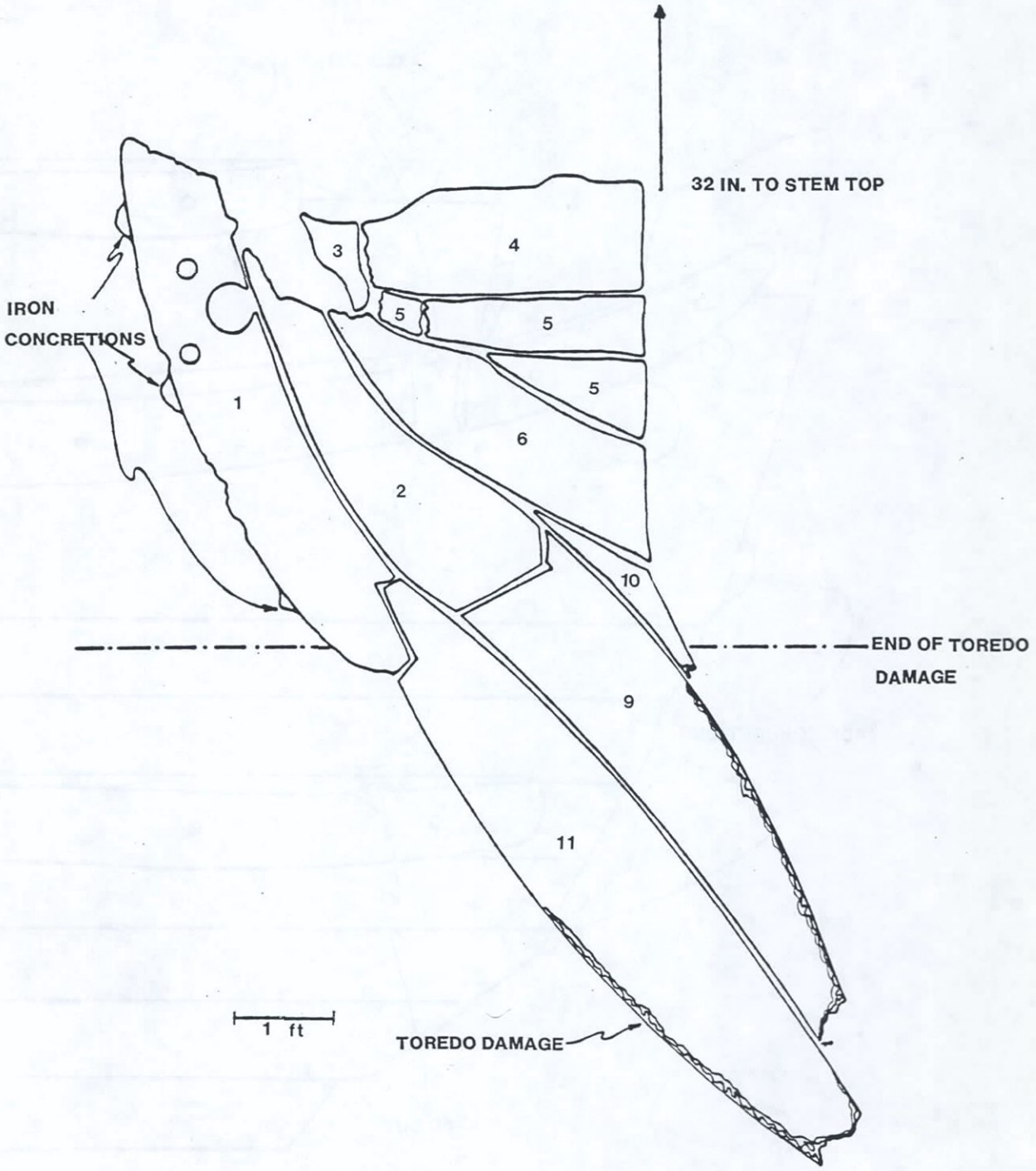


Figure 7.19
175 WATER STREET

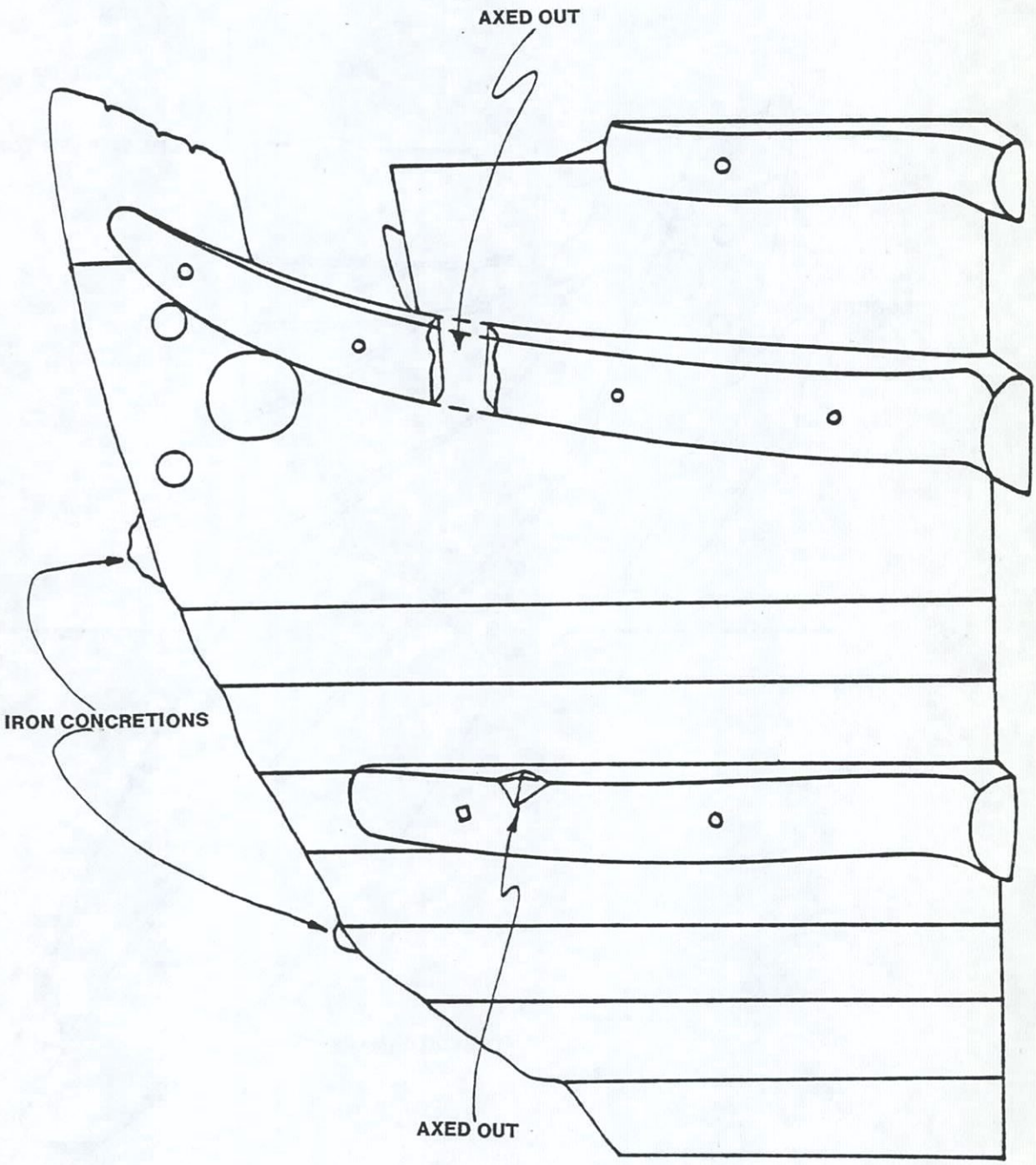
The Ronson Ship
Exploded Diagram of Beak



(numbers represent recordation system)

Figure 7.20
175 WATER STREET

The Ronson Ship
Sheathing & Knees on Beak



Up 8 inches and out 3 inches along the gunport sides were two recoiling rings. Fortunately, both rings were still intact. Inch-thick U-bolts fastened the rings to the hull. The right had a U-bolt set vertically, while the left-hand bolt was set askew. During the recording of the port the right-hand ring disintegrated. As soon as we had recorded the left-hand ring, we cast it in a wax mold before removing it.

The second port uncovered was directly across form the mizzenmast step. Only the opening and outer chock remained. These indicators were not recognized until late in the excavation, when we commented on what a convenient step we had found to get down into the hull. Suddenly, we realized what the space represented. Eighteen feet were measured off between the gunports, convincing us that another port lay hidden in the lot wall. During the demolition of the site we watched carefully as the large backhoe pulled down the wall between the two known gunports. As we had suspected, a third port was exposed. It was located 8 ft. forward of the sternmost gunport. The distance between the two ports was easily calculated since both sat directly over deck beams. Interestingly, the forwardmost gunport did not sit over a deck beam, but rather sat between the two intermediate beams of the main hatch.

Another port was uncovered between frames 19 and 20 in the very stern. Its opening was only 10.5 inches wide. A single sill sat directly over the waterway and spanned the distance from the inside of the hull to the outside. The port's small size and closeness to the lower deck floor negates its use as a gunport. More likely the port served as a window for the rear cabin.

Using Davis' standard table for figuring gun size from port dimensions, the Ronson Ship carried at least six 6 lb. cannons (Davis 1929:110). The diameter of the cannonball multiplied by various numbers, dictated the spacing between ports, the port dimension, and gun carriage measurements. For example, 25 times the diameter of the ball equals the *minimum* distance between which a shipwright could safely space his gunports. A 6 lb. cannon ball is roughly 3.5 inches in diameter. The sum of the ball size multiplied by 25 requires a minimum of 7 feet 3.5 inches between 6 lb. gunports. The Ronson ship builder was well within this limit, spacing his ports 8 feet to 10 feet apart.

In addition to the stern gunports, one 2.62 inch diameter cannonball (for a 3 pounder) was found in the bow. The ball's location in the bow suggests it may have been left over in an area once used as a shot locker. A shot locker in the bow holding small cannonballs indicates that, in addition to the stern 6 lb. cannon, the Ronson Ship carried light guns in the bow.

Pictorial evidence from the Burgis View of New York harbor shows a ship at anchor armed with only three gunports in her after quarter (Plate 6.26). The Ronson Ship may have closely resembled the ship at anchor carrying six 6 lb. cannons and two to four light guns mounted in the bow or bow and stern.

BEAK

The beak is the forward continuation of the centerline of a ship. It functions as a support for the bowsprit which protrudes from the ship's bow. The beak also supported the well-known figurehead and earlier, in the eighteenth and seventeenth centuries, decorative wooden festooning often graced its flanks.

Luckily, most of the Ronson Ship beak was below the nineteenth century basement level. In fact, the top pieces served as footings for basement floor boards. During excavation we were able to clear the dirt away down below the lowest knee. Fear of cave-ins inhibited further excavation and in-situ study. Later, along with the bow disassembly, we also dismantled the beak. We attempted to sequentially number each piece as it was taken out of the ground. Since then we have reassembled the pieces and now have a clearer idea of what the beak looked like.

Nine timbers meshed together in puzzle-like fashion to create a solid wall illusion (Fig. 7.19). The outer timber (No. 1) is known as the bobstay. The large holes drilled through it (5 inches and 3 inches in diameter) are for the "gammoning." Gammoning is the rope that wraps around the bowsprit and holds the spar down. Only one large gammoning hole remains in the beak, although the edges of pieces 2 and 3 indicate that the second hole was just in and above the extant hole. The pieces behind the bobstay are filling chocks. They were cut to fit snugly together and bolted tight. Evidence of three concreted bolt heads on the bobstay's front edge was found during excavation. They may have held a figurehead, some bowsprit rigging, or another beak timber. Otherwise there are no distinguishing marks on any of the chock pieces.

Two-inch oak planks were fastened over the sides of the beak. They varied in width at the top but became quite regular (6 inches to 8 inches) as they descended down the sides. These boards were not treenail fastened but rather lightly iron nailed to the beak timbers (Fig. 7.20). Outside the planks were three knees. Each had one arm attached to a wale on the bow. All the knees were well fashioned with smooth edges and tapering ends. The second or middle knee was the longest, curving gracefully out along the beak between gammoning holes. Both top and lower knees traveled out straight along the beak. The top knee was the smallest of the three. This knee and the middle knee attached to the channel wales on the hull, while the lowest knee attached to the main wale.

The general shape of the beak is much fuller than middle and late eighteenth century designs. The full curved beak is more reminiscent of seventeenth or early-eighteenth century forms. Note the full beak of the RUPERT, built in 1664 compared to the smaller, more angular beak of the Continental frigate HANCOCK built in 1776 (Plates 7.26 and 7.27). The full beak shape is yet another clue in the search for the age and identity of the Ronson Ship. Other information, such as the teredo damage, is also helpful charting how much cargo she carried and where.



Plate 7.26: Vessels similar to the Ronson ship's design are clearly depicted in this detail from the Burgis View of New York Harbor dated 1717 (photo by Carl Forster, New York City Landmarks Preservation Commission; photo courtesy of the National Maritime Historical Society).

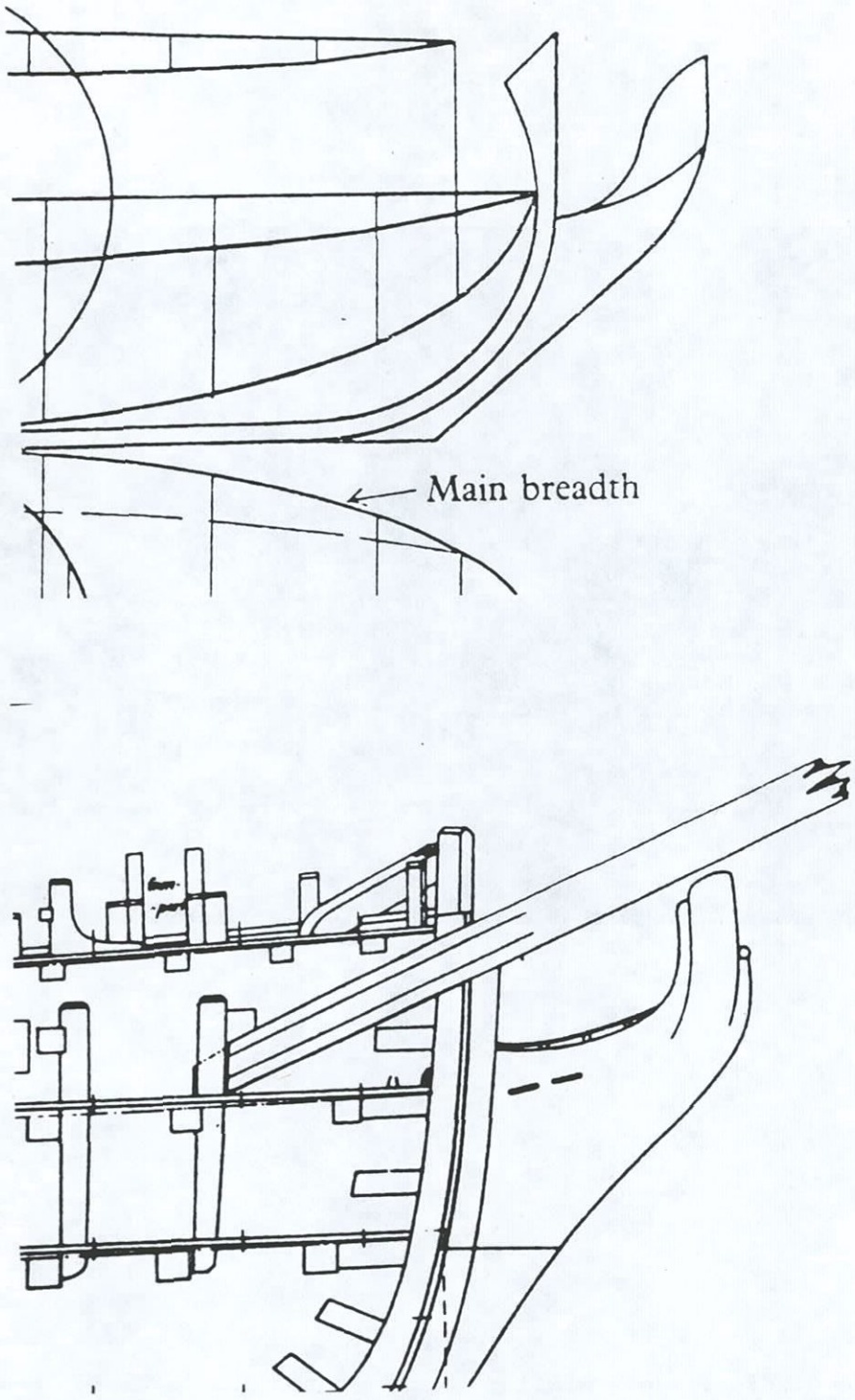


Plate 7.27: The beaks of the RUPPERT (above, from Abell 1948:50) and the HANCOCK (below, from Chapelle 1935, Plate I) represent the evolution of style from the seventeenth to eighteenth-century shipbuilding.

Extensive teredo damage appeared on certain beak timbers. Pieces 9, 10, 11, and the lowest knee have worm eaten bottoms and edges. Those timbers above the lowest knee show no signs of teredo damage. A teredo worm must be completely submerged to survive, therefore the majority of pieces 9, 10, 11, and the lowest knee must have been under water. The teredo demarcation line reflects the waterline of the hull. Adding this evidence to the teredo demarcation on the stempost and outer hull planks in the bow, we place the waterline just under or at the main wale. Thus, the freeboard or distance between the sunports and water line was only 1 ft.

SHIP FASTENINGS

We discovered a variety of fastening types aboard the Ronson Ship. The fasteners were either varying in shape and size or wooden treenails. In the early seventeen hundreds, like-on-like fasteners were preferred. Tradition and experience had taught the shipwright how to use different species of wood to make tight joints. Iron was still expensive, although less so in Europe than the Americas. Iron fastenings were frequently used in difficult-to-reach areas, places that need very long fasteners, and boards that required quick fastening before treenails could be hammered in.

The most prevalent and strongest fasteners aboard the Ronson Ship were treenails. Treenails, pronounced trunnels, are wooden nails. Handmade with a spokeshave in a hot dry room to avoid fiber expansion (Davis 1981:25), they have a faceted appearance. Initially 2 feet to 3 feet in length, they were driven into predrilled holes with large mallets. The mallet's wallop compressed the wood as it forced its way through the slightly smaller diameter hole. When the pounding finished, the wood absorbed moisture from the air and expanded back to its original size. This made the fit very tight and strong. Then, using an adze, the shipwright cut off the excess dowel on either end, making the nail flush with the surrounding wood (Fig. 7.21).

Sometimes a shipwright drove a wedge into one end of the treenail to insure the tightest fit possible. In other instances, a shipwright would leave one end of the treenail squared off. In the end of the predrilled hole, he would chisel out a matching square. Square end treenails were generally used on large timbers.

So far, no wedges have been found in the Ronson Ship treenails. A few square nails were found in treenail ends. Whether this was coincidence we can not tell without further study. However, most of the treenails are marked with an impressed dot in the end's center and an "x" scratched through the dot. These markings were probably guidelines for the man who carved the treenails, helping him keep as close to round as possible. Although our shipwright did not use wedges, he did use square-end treenails on the wales.

The Ronson shipwright had several species of wooden treenails available when he built the ship; juniper, hickory, ash and oak (Table 7.3). Juniper, ash and oak grow in northern Europe as well as North America. Hickory, however, only grows in North American (Collier's New Encyclopedis 1921:V 29). This information about fastener composition is helpful to us as we attempt to identify the ship's origin and better understand the intricacies of eighteenth century trade.

Both types of treenails withstood the rigors of time, unlike their ferrous counterparts. However, as we dismantled the bow pieces on the final day, we notice the juniper treenails desintegrated into a cable of wood fibers when detached from the timbers, while the hickory treenails remained strong and ungiving. In fact, the hickory treenails could not be broken. The timbers they held had to be slid off the slightly shrunken treenails.

Even though the treenails were still extant throughout the ship, the iron fasteners reacted with the corrosive salts around them and are nothing but black carbon today. However, their impressions and a few concreted remants appeared in several different styles; large square spikes, small square nails, bolts, and large drift pins. From this scanty evidence we gathered our information about the various iron fastenings.

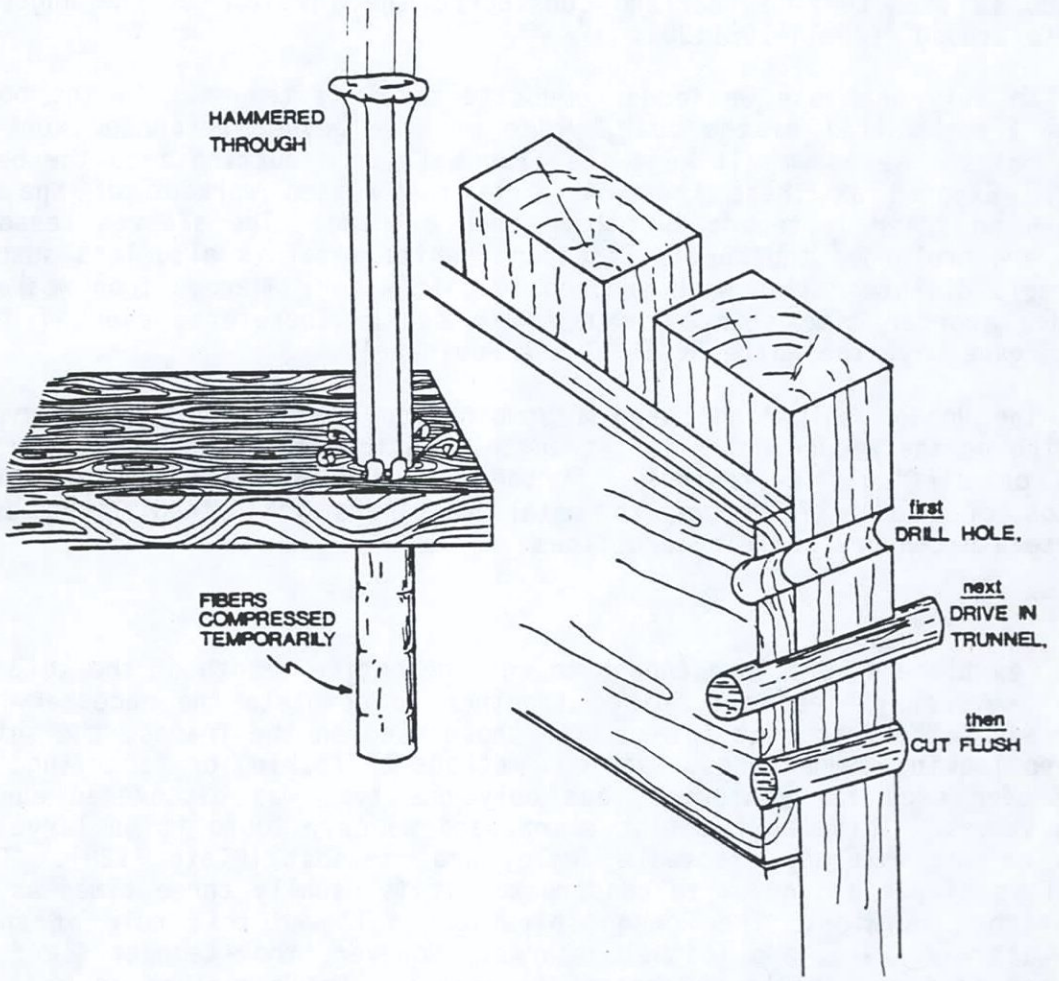
The large square spikes fastened planking to frames at the bent end of a plank. When the shipwright bent the preformed planks around the ship's bow, he had to fasten them quickly in place before they relaxed. Drilling and driving treenails was too slow, so he drove in large spikes to keep the planks in place.

Elsewhere, deck planks, other planking, and ceiling planks were tacked down with smaller square nails, before treenails could be hammered in placed. In some instances, use of a small nail instead of a treenail indicated replaceable boards. All deck planks except the first strake (nibbing strake) on both the upper deck and lower deck were tacked to each deck beam they crossed with two small square nails. Some of the decking had nail holes that did not extend all the way through. A few had treenails that didn't attach to any underneath timbers. This evidence may represent secondary use of the deck planks or the positions of temporary walls. The relatively light fastening of decking is reflective of the short life of deck planks. Buffeting cargoes and heavy gun carriages quickly ruined pine deck boards. Decking was regularly replaced or removed to accomodate cargoes. On the lower deck near the main hatch there was a small square where the decking had been replaced (Figure 7.11).

Another example of light nailing of replaceable boards was the outer sheathing planks. These 1 inch thick boards were nailed onto the outer planks over horse hair and pitch. Every two to three years these planks, having been eaten by teredo worms, were removed and replaced with new boards. The use of small nails insured easy removal and did little damage to the more permanent outer hull planking. During cleaning of the outer planking numerous small nail holes were found on the outer face of the planks, as well as caulked teredo holes. The quantity of nail holes and teredo holes reflect the many changes of firring on the Ronson Ship.

Figure 7.21
175 WATER STREET

The Ronson Ship Treenailing Process



(from Baker 1978)

Iron bolts and drift pins held large timbers in place. Bolts attached the lodge knees and hanging knees to deck beams and the side of the hull where the shipbuilders could not easily drive a treenail (Figures 7.6 and 7.7). Bolts also held the thick wales in place while the treenails were driven. Concreted bolt heads were found on the garboard strake between each frame set in the amidships section. The purpose of these bolts is unclear.

Long bolts or drift pins ran through the 4 inch wales, the 8 inch hawse pieces, the 2 inch ceiling planking, and the 12 inch breast hooks in the bow securing the massive structure in truss fashion. Drift pins also fastened keelson, floors, and keel together, forming a rigid backbone for the ship.

These long bolts required carefully drilled holes sometimes as long as 4 feet. Interestingly, the men who drilled these long bores were considered elite. Their tool was the auger, ranging in size from 0.5 inches up to 2 inches in diameter. Sutherland considered the inventor of the auger worthy of "sainthood" (Abell 1981:90).

In only one case we found composite metal fasteners. In the bow where three knees bolted to the beak, white metal sleeves surrounded some of the iron bolts. We assume it kept the iron bolt from cutting into the beak knee wood. Exposed as these knees were to the rugged workout of the oceans, strain on their fasteners must have been extreme. The sleeves lessoned the wear and prolonged the knee's lifespan. White metal is also less susceptible to rapid disintegration when exposed to salt water, whereas iron weakens over a much shorter time span if exposed to salt. Therefore, even if the iron bolts gave way, the white metal sleeve would hold.

The Ronson shipwright used a combination of fasteners, wood and metal, relying on the wooden nails for strength, and iron for light temporary fastenings or difficult fastenings. Further studies of fastening patterns and ratios of wooden fasteners to metal fasteners will shed light on early eighteenth century building practices.

SCARFS

Few timbers were long enough to run the entire length of the ship; therefore, several pieces were joined together to complete the necessary length. Instead of the weak butt joint, like those used on the frames, the shipwright carved locking timber ends. Various methods of locking or "scarfing" timbers have been used for centuries, but only one type was discovered during our excavations. This was the flat scarf, and we only found it on large timbers such as the waterway, footwale, wale, and stempost (Plate 7.28). The flat scarf is simple and quick to construct. It is usually three times as long as the timber is wide. The Ronson shipwright followed this rule of thumb for the waterway, wale, and footwale scarfs. However, the stempost scarf is only as long as the timber's thickness, 14 inches. The curvature of the stempost may have precluded a longer scarf.

Except in these few instances, the shipwright used butt joints rather than elaborate scarfing. He depended on reinforcing to keep them strong. The integrity of the hull, even after two hundred years, appears to have proven the wisdom of his choice.

EVIDENCE OF AGE

While excavating the Ronson Ship, and later during conservation cleaning, we noted many details that suggested why the ship had been used for cribbing. The Ronson Ship was a well-built, well-kept but old ship. The strain of the cargo weight and brutal seas had caught up with her; she could no longer be trusted to carry precious cargo between ports. Signs of wear appeared throughout the hull.

Her foremast step had cracked and later been patched with nails and caulking. The waterway at amidships had split in two. Caulking and a small board hastily nailed across the crack held it together. Sections of deck planking showed signs of mending. Even the outer hull was mended. During the final demolition of the site a large lead patch on the outer hull was exposed by the construction backhoe. Outer hull planks in the bow had as many as thirty small nail holes across their outer face, reflecting the many changes of firring. But even with the protective measure of sheathing, the teredos had eaten through to the hull planks. Several bow planks have caulked teredo holes underneath the most recent horsehair and pitch protective coating.

The cracks, teredo damage, and general wear and tear all worked together, continually weakening the hull until the owners realized it was too risky to sail her. Whether she was bought for the block filling process or owned by an investor on the block is not yet known. The eighteenth century Burgis View of New York Harbor does show several hulks at anchor stripped of their rigging. Whether their presence is a result of age or a slow economy is not known. However, we do know that several hulks are buried under South Street Seaport and that as many as eight hulks were unearthed when the telephone building, just north of 175 Water Street, was constructed in the early seventies. More study needs to be done in this area in order to correctly place the Ronson Ship in the eighteenth century context.

CONCLUSION

From the detailed study of the Ronson Ship's hull and New York Naval Office Records from the early eighteenth century we now have a better understanding of early colonial period shipbuilding and trade capacities. The ship was a large common carrier for her time. Registered between 170 and 210 tons in the American colonies, or 260 and 300 tons in Europe, she was smaller than the huge East Indiamen yet larger than the more prevalent 50-to-100 ton coasters.

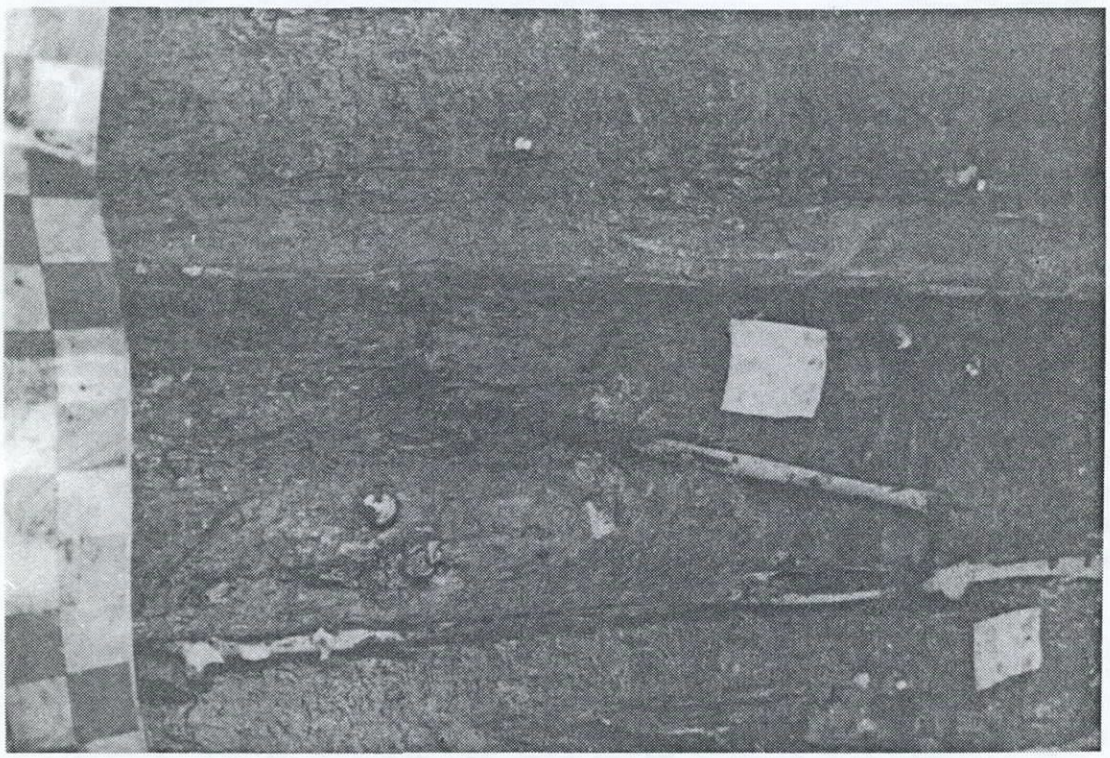


Plate 7.28: Flat scarfs were some of the complicated joinery found on the Ronson ship.

The 100 foot ship was a transoceanic vessel which made at least one voyage to southern latitudes as evidenced by warm water teredo damage to her outer hull sheathing. Her wide beam (26 feet) and deep hold (12 feet), in combination with a strong mould framing and sturdily constructed bow, provided ample room and strength to carry a variety of goods anywhere in the world. Her entrances and sailings were important to colonial New York, a small but quickly developing port. During her life she was probably the pride of those who built, owned, and manned her.

Finished construction, tailored decking, strong bow, and mould lofted frames indicate that an expert shipwright constructed the vessel in a large shipyard.

The use of American hickory does not define the Ronson Ship as colonial built. Hickory was exported from North America along with other timber products. However, several construction techniques, such as the ratio of iron to wood fastenings, the consistently narrow timbers and the variety of treenails indicate a European built vessel.

DIRECTION OF CONTINUED RESEARCH

To date we have excavated and recorded the ship remains and her contents. In addition we have conducted a preliminary analysis of the hull and its historical context.

Analysis of the ship remains has been limited to a plan of the ship as she lay in the site and a discussion of her construction and notable features. But years of overburden have distorted the ship slightly from her original lines. Our future plans include the determination of her original design through analytical graphics and three dimensional research models in collaboration with the person assigned to reconstruct the remains of the bow.

Once we have determined her original design we shall conduct a more thorough study of the shipwright's construction techniques. From this we hope to discover the interrelation of the structural and finished construction of early eighteenth century merchant ships. Of special interest is the heavy, interlocking frame construction of the bow, which provided some surprise to maritime scholars. A thorough study of the ship as an example of the best of early eighteenth century engineering will provide information about the contemporary knowledge of flexible structure built to withstand complex dynamic forces.

We will continue the historical research of the ship by further studies of the New York Naval Office Records and a study of pertinent insurance and family records. Together they may provide evidence about the identification of the ship and a history of the ship and the people involved with her.

The most valuable information for nautical archaeology and maritime history will be the knowledge gained from a careful study of the interrelation of information coming directly from the ship's remains and contents, and the extant knowledge of early-eighteenth-century ship construction and the merchant shipping trade. Correlations between cargo capacity, estimated average crew and speed, rigging, and armament will provide evidence for calculations of investments-and-expenses vs. return for this singular example of the colonial merchant trade.

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SHIP FIELD EXCAVATIONS DESCRIBED BY LOCUS
(Jay Cohen and Bertram Herbert)

Lot 30 (176 Front St.)

Lot 30 is located north of the bow sections of the Ronson ship.

Two loci were encountered beneath the foundation floor; the first, locus 30.0.001, was described as brownish black silt with inclusions of light greenish grey clay. The artifacts from this level were from both the eighteenth and nineteenth centuries and comprised both diagnostic and non-diagnostic cultural materials. The deposits varied in thickness from 6 to 25 inches. Locus 30.0.002, the beak from the Ronson ship, was also underlying the foundation floor. This was oriented in a north/south direction, contiguous with 30.0.001. The beak timbers were cleared of all fill, drawn, and photographed for later removal (see Bow Removal).

Lot 31 (174 Front St.)

Excavation began February 5, 1982. Once the building debris was removed by backhoe, archaeologists were able to continue clearing the rubble by shovel excavation. The exposed vertical frames of the hull extended under the nineteenth century foundation approximately 19 feet east on to a point where the hull entered the east wall. It was then determined that the hull of the ship to the north and west, as well as the 31/32 lot wall to the south, would define the excavation unit in Lot 31. The unit was given the designation of 31.0 and a lot datum was established on the south 31/32 lot wall. Once the unit and datum were established in Lot 31, a test trench, approximately 3 feet wide (east/west) was defined using the ship's port side hull as the west side, and extending north to the curve of the bow and then approximately 6 feet south. This trench was later extended another 9 feet south to the 31/32 lot wall.

The first locus encountered below the foundation and rubble was 31.1.001. This soil was described as a brownish black silt, with inclusions of light grey clay, containing numerous artifacts from both the eighteenth and nineteenth centuries, as well as a large amount of building rubble. This fill level ranged in thickness from 6 to 21 inches and extended across the entire unit. Once this level was excavated, several structural features were exposed: uppermost sections of the ceiling planks 31.0.030 on the port side of the hull, a hanging knee in the south west corner of the unit which was contiguous with the ceiling planks 31.0.030, the upper portion of the samson post, and a breast hook on the bow of the ship.

Locus 31.0.002 was underlying 31.0.001. This fill level was described as brownish red sandy silt with inclusions of wood chips and rubble. The concentration of wood chips increased with depth, and the cultural material contained within this fill deposit was from both the eighteenth and nineteenth centuries. The thickness of the fill deposit varied from 7 to 16 inches and was thickest in the northeast portion of the unit. It extended

across the entire unit and was contiguous with 31.0.030, the ship's port side hull. Underlying 31.0.002 was locus 31.0.003. This fill deposit was described as red brown sand with large pieces of wood and inclusions of black silt. The cultural material consisting of artifacts also from both the eighteenth and nineteenth centuries as well as the wood fragments, increased with depth in this fill deposit which ranged in thickness from 12 to 19 inches; the deposit extended across the entire unit and was contiguous with 31.0.030. Under this was locus 31.0.004, a thick deposit of wood chips and splinters mixed with red brown sand. The primary component of this fill was wood fragments with lenses of reddish brown sand and greenish grey clay, varying in thickness from 13 to 34 1/2 inches thick. In this fill level, there was a noticable increase in cultural material consisting primarily of eighteenth century artifacts; this level was also contiguous with 31.0.030, the ceiling planks on the ship's port side hull. Exposed in this deposit were the uppermost sections of the collapsed main deck planks, locus 31.0.029, that sloped down toward the center of the unit. Also below locus 31.0.004 was 31.0.005, a thick fill deposit varying in thickness from 5 to 49 1/2 inches and described as a reddish brown sandy silt containing gravel with lenses of greenish grey clay and red sand. The lens of greenish grey clay was overlying the deck planks, locus 31.0.029. Sitting on this interface were approximately two and one-half dozen articulated clams that may very well represent the interface of two fill episodes on the ship. The cultural material contained within this deposit appears to be from the early- to mid-eighteenth century. The ceiling planks, locus 31.0.030, continued, to extend down and began to curve, forming the bow of the ship. Also, the second "breast hook" and "dove tail" were exposed in this level. At this depth, locus 31.0.005 was contiguous only with the ceiling planks, 31.0.030 on the port side of the hull. Elsewhere it was contiguous with the deck planks, locus 31.0.029. In the south central portion of the unit, where the deck planks collapsed, it overlays locus 31.0.006.

As mentioned earlier, the deck planks and support beams locus 31.0.029, lay beneath loci 31.0.004 and 31.0.005. The collapsed deck planks remained relatively intact and contiguous with the ceiling planks locus 31.0.030 but caved in toward the south central portion of the excavation unit. The deck planks, which were approximately 3/4 to 1 inch thick, were oriented in a north/south direction.

Once the deck planks were cleared of all fill and fully exposed, a scan-sketch was drawn of the existing deck and the wood planks were numbered. Trilateration measurements were then taken using the overhead grid system. When this was completed, the deck planks, locus 31.0.029, were removed by chain sawing where they entered the east and south unit walls.

After the deck planks were removed, the remainder of locus 31.0.006 was exposed. This fill, located along the south wall of the excavation unit, was described as greenish grey clay with gravel and lenses of white sand. The fill extended across the entire unit as well as lying contiguous with the ceiling planks, locus 31.0.030, of the ship's hull. The cultural material within this deposit consisted of both diagnostic and non-diagnostic artifacts from the early to mid-eighteenth century.

Locus 31.0.007, the next fill deposit to be excavated, was described as black sand and gravel, possibly the remains of the ship's original ballast, an interpretation suggested by shell and coral composition of the sand. This fill deposit, approximately 30 to 40 inches thick, was contiguous with as well as overlying the ceiling planks, locus 31.0.030. The deposit reached its maximum thickness in the central portion of the unit above the ship's keelson. The cultural material within this fill level consisted of early-eighteenth century artifacts. A wooden barrel, locus 31.0.008, was also uncovered in this level. The barrel, sitting on the keelson, contained pine needles, locus 31.0.028, which may have been a packing material.

As mentioned above, the remainder of the ceiling planks were exposed after locus 31.0.007 was completely excavated. These planks were then drawn (scan sketch), numbered, and triangulated using the overhead grid system. Once measurements were completed, locus 31.0.030 was removed; a chain saw was used to cut the planks where they extended into the south unit or lot walls. Removing the ceiling planks revealed the frame sequence of the ship's bow section. This consisted of frames and hawes pieces, oriented in an east/west direction, and the stem centrally located between the hawes pieces and oriented in a north/south direction. These structural parts were numbered and measured for later removal. Fill redeposited between the frames, hawes pieces, and the stem was given the following locus numbers: 31.0.010 - .014, .016 - .020, .022 - 026. These soils were described as a brown and reddish brown sandy silt getting siltier with depth where the deck planks, locus 31.0.029, were contiguous with the hull, and grading to a greenish grey clay where the wood has collasped away from the hull. These deposits containing early-eighteenth century artifacts, varied in thickness from 4 to 14 inches. Underlying these deposits were the outer hull planks, locus 31.0.031. Once the actual excavation in Lot 31 was completed, a team of archaeologists, under the direction of project co-director Sheli Smith, began recording the structural timbers of the ship's hull (see Hull Documentation).

Lot 32 (172 Front St.)

Excavation began January 4, 1982. Once the debris from the concrete floor was removed, the archaeologists were able to observe the interior port side of the Ronson ship underlying the south foundation wall. This hull section, oriented in a north/south direction, became the boundary for the west side of the excavation unit. After establishing the unit (32.0), boundaries, and lot datum, a 4 feet x 16 feet test trench was opened using the exposed hull section as the western boundary and the nineteenth century lot walls as the northern and southern borders. The first locus encountered under locus 32.0.002 was 32.0.003 which consisted of very black sandy silt with a great deal of carbonized material. This locus was also contiguous with the ceiling planks of the ship's port side hull. The fill in this level contained building rubble from the preceding locus. Its thickness ranged from 2 to 10 inches across the entire unit. Based on the artifacts and the horizontal and vertical limits of the locus, it appeared that this material was used as a footing or bedding for a nineteenth century foundation wall.

Only one locus, 32.0.004, was encountered below 32.0.003. The footing material was also contiguous with the ceiling planks on the port side of the ship's hull, and was described as medium brown and grey mottled sandy silt with small inclusions of a blacker sandy silt. There was also a noticeable increase in the number of eighteenth and nineteenth century artifacts recovered from this locus. This locus overlayed the ship's weather deck, locus 32.0.018, which appeared to have collapsed from the weight of the overburden. Therefore, the thickness of 32.0.004 which varied from 4 to 27 inches, was defined by the contour of the collapsed deck and was thickest in the center of the unit. As mentioned above, the weather deck was uncovered below 32.0.004. Although it had collapsed, it remained relatively intact and consisted of planking, predominantly along the east wall, oriented in a north/south direction, sloping down and to the west and along the west wall sloping down and to the east.

Once the weather deck planks were fully exposed, a scan sketch was drawn and the planks were numbered and trilaterated using the overhead grid system. After recording was completed, the weather deck was removed exposing the deck support beams. These support beams also had suffered damage from the collapse that caused them to slope towards the center of the unit. There were two loci underlying the weather deck and support beams.

Locus 32.0.005 was described as fill consisting of reddish brown and dark brown mottled silty clay with inclusions of wood chips and splinters. The cultural material recovered from this fill level was from both the eighteenth and nineteenth centuries and included a great many bricks and much mortar and coral. The coral occurred predominately in the central and eastern portions of the unit. This locus varied in thickness from approximately 2 to 41 inches and was contiguous with 32.0.006. Locus 32.0.006 which extended across the unit, was characterized as a reddish brown and dark brown mottled silty sand with lenses of decayed coral. At approximately 18 inches, the deposit on the west side of the unit was thickest; it decreased in thickness to form a 2 inch lens of decomposed coral in the central and eastern portion of the unit. The entire deposit was contiguous with the ceiling planks on the ship's port side, 32.0.019, as well as overlying the ship's second deck, or the main deck, locus 32.0.020.

The main deck also extended across the entire unit; it consisted of 2 inch wood planks oriented in a north/south direction. Once the deck was cleared of all fill, a scan sketch was drawn and the wood planks were numbered and trilaterated using the overhead grid system; they were then removed. Where the deck planks entered the north and south lot wall, they were cut using a chain saw. The deck planks were supported by 12 inch thick deck beams oriented in an east/west direction. Several of these support beams extended across the entire unit while others extended only as far as its central portion. The support beams that extended across the entire unit were attached to the port side ceiling planks, 32.0.019, and to the hull by lodge knees that were positioned on the south side of the support beams. Below the main deck and support beams, locus 32.0.007 was exposed. This layer of fill, occurring across the entire unit, was described as a grey silty sand with brick and mortar. Lenses of white decayed coral and grey

clay were also exposed. The white decayed coral, originating from the eastern edge of the unit, actually appeared to be an inclusion that extended 72 inches as well as sloping down towards the south. The grey clay lens occurred under the main deck and support beams and extended to the eastern edge of the unit. Approximately 42 inches from the surface the main deck, 32.0.020, and the ceiling planks, 32.0.019, were continguous. At this juncture, the hull began to curve toward the east forming the hold of the ship. The fill in the hull contained eighteenth century artifacts as well as many rocks and pebbles. The locus thickness varied from 20 inches at the western edge of the unit to 75 inches along its eastern side. The keelson was exposed at the bottom of this locus.

Beneath this deposit was locus 32.0.008, a material described as whitish grey coral sand with tan yellow silt and inclusions of crushed shell. The deposit was approximately 2 inches thick and contained eighteenth-century cultural material. The rest of the ceiling planks, foot wales, and keelson were then exposed.

Once the deposit within the ship's hold was excavated, a scan sketch was drawn of the ceiling planks which were also numbered and trilaterated using the overhead grid system. After completing the measurements, a chain saw was used to remove the ceiling planks where they met the north and south lot walls. Removal of the ceiling planks exposed eight frames, half frames, and futtocks. The soil between the frames were given separate locus numbers. These deposits were described as dark brown sandy silt which became sandier with depth. It had inclusions of coral, gravel, brick, shell, and stone. These loci contained eighteenth century cultural materials. Excavation of deposits exposed the ship's outer hull planking. The contours of the frames and outer hull planking were then trilaterated under the direction of the project co-director Sheli Smith.

Lot 33 (170 Front Street)

This is the lot in which the exterior port side of the Ronson Ship was originally exposed (see Lot 33, Deeptest, Chapter 3). Initially, within a unit designated 33.10, ship excavations began while archaeological investigation of the lot's yard was still in progress further to the west. As early excavations proceeded by locus number, the size of the ship was suggested.

Locus 33.10.001, consisting entirely of nineteenth and twentieth century debris, was identified as asphalt, trash, rubble fill, and concrete floor. It was removed by backhoe and brought to an approximate depth of 77 inches. The next locus, 33.10.002, was identified as a dark brown to grey/brown silty sand with inclusions of wood shavings and rocks. This locus, approximately 50 inches thick, was followed by 33.10.003, defined as a decomposed coral or white sand with an approximate thickness of 12 inches. What followed was Locus 33.10.004, an in situ section of a deck, and the end of unit 33.10. (Note: For clarity in recordkeeping, after the deck was removed, the unit designation was changed to 33.11; this distinguished between the ship investigations undertaken while the yards were still being excavated (33.10) and those which followed when only the ship was being excavated and the remaining block excavations were complete.)

Since a delay of some 21 days occurred between the initial exposure of the upper deck in the lot and its removal, there was an accumulation of debris on top of the deck. Removal of this debris was identified as 33.11.011. Locus 33.11.002 defined a collapsed deck south of what was identified as 33.10.004. After the removal of Locus 33.11.002, 33.11.003 was defined as deck beams and decomposed coral (white sand) in between the deck beams. 33.11.004 defined the locus under 33.11.003, and consisted of decomposed coral with intrusions of grey sand and fine black silt. The depth of this locus varied from approximately 10 inches in the southwest to 60 inches in the northwest. Locus 33.11.005 was defined as a breaker beam and lodge knee adjacent to the north wall of the lot.

Locus 33.11.006 was decomposed coral with intrusions of both grey sand and fine black silt, the same matrix designation as 33.11.004. It was given a separate locus since the north wall had collapsed in the unit; the intent was to differentiate between material coming out post and pre-collapse of the north wall. This locus was followed by 33.11.007 defined as ballast and decomposed coral.

Below the keelson, original ballast, possibly associated with the ship and not a redeposited material, may have been encountered; this was defined as 33.11.008 and was described as original ballast with intrusions of decomposed coral. (Note: This may well be redefined as to whether or not it was original ballast.) The thickness of this locus varied from 5 to 6 inches. Locus 33.11.009 followed and was defined as the ceiling planking over the frames.

After the removal of 33.11.009, the frames and areas between them were exposed. Each section between any two frames was considered a separate locus. The frames in Lot 33 were labelled from north to south (I,J,K,L,M,N, and O). Locus 33.11.010 (between frames N and O) was defined as decomposed coral with intrusions of wood chips, waterworn cobbles, and grey clay. This same description fit Locus 33.11.011 between frames M and N, Locus 33.11.012 between frames L and M, Locus 33.00.013 between frames K and L, Locus 33.11.014 between frames J and K, and Locus 33.11.015 betweeen frames I and J. Excavation of these loci was followed by the measuring of the frames by the recordation team (see recording section for further detail).

Lot 34 (168 Front Street)

A backhoe trench was dug in Lot 34 along the west side of the lot to expose the landfill and define the depth to the ship's deck. The trench defined the outer hull (port side) and what later was defined as deck beams. It also defined the interior dimensions of the ship within the lot: to the north, 153 inches; to the south, 117 inches; to the east 153 inches; and to the west, 144 inches.

The soil underneath the floorboards was defined as Locus 34.0.001. The first layer within this locus was described as a mixed grey/black fine sand extending across the excavation unit. The thickness of this layer was approximately 28 inches and included mottled red/grey sand, black silt stain, and red bricks. A second layer was a dark grey fine silt that extended from the western edge of the ship and dissipated at 132 inches to the east. The thickness of this layer, which has inclusions of a light grey clay and tan silt with decomposed wood, varied from 10 to 14 inches.

The third layer articulated with and extended under the second where it had terminated, and continued across the entire lot. This third layer, a medium gray silt with oyster shell, varied in thickness from the eastern end of the lot (28 inches) to the hull in the western part (24 inches). A 3 to 6 inch lens of wood chips in this layer appeared approximately 18 inches west of the eastern side of the lot and extended southwest until it articulated with the deepest extent of the layer approximately 16 inches from the western side of the ship.

After Locus 34.0.001 was excavated, the lot was quartered and two opposing units were dug: 34.01 and 34.03. Locus 34.01.001, 4 to 7 inch level, was defined as a dark grey silty sand with inclusions of brick, mortar, oyster shell, and wood chips. Locus 34.03.001 was defined as a dark grey silty sand level varying from 8 to 11 inches.

The procedure of quartering the lot was abandoned once it was realized that the soil matrix was too unstable to maintain internal walls for profiling. Therefore, subsequent unit designations refer to entire lots rather than excavation quadrants. In this lot, the lot/unit designation was 34.05.

Locus 34.05.001 extended under Loci 34.01.001 and 34.03.001 to a thickness of approximately 54 inches. The matrix was defined as a grey clayey sand with inclusion of tan sand and a lens of yellow brick that weighed 310 kilograms. Also within this locus, a bucket (or tub) was exposed and excavated as a separate locus (34.05.002).

The next locus, (34.05.004) was divided into layers. Layer 1 was defined as a light grey sand with silt and large rocks, and nodules and fragments of flint. It extended 48 inches west from the eastern side of the lot and varied in thickness from 31 inches in the east to 4 inches where it ended at the ship's ceiling planking. This layer, a sand ballast, was either adjacent to, or overlapped by, the next three layers to be described. Layer 2, which extended from the frames along the hull eastward until it abutted with the western extent of layer 1, was brown silty sand with gravel. It varied in thickness from 4 inches in the west to 18 inches at its eastern extent. Layer 3, a grey clay, underlay layer 2 and partially sat on the ceiling planking. It extended from the west, where it articulated with the ceiling planking and abutted with layer 1 and what will be defined as layer 4, a distance of 64 inches. Its thickness varied from two inches in the west to 10 inches in the east.

Layer 4 underlay layer 3 and abutted with layer 1 to the east. It was 3 inches thick and consisted of white decomposed coral sand that extended a distance of 44 inches across the bottom of the hull above the ceiling planking. After the ceiling planking was removed exposing the frames, discrete loci numbers were given to the spaces between them. The frames in lot 34 were numbered from south to north (Numbers 7, 8, 9, 10 and 11). All the loci between these frames (34.05.006, .007, .008, and .009) consisted of a dark grey/brown sandy silt with inclusions of flint and shell.

Lot 35 (166 Front Street)

Locus 35.0.001, west of the port side of the ship and east of exterior cribbing related to the ship as landfill, was identified as dark grey/black silty sand, as was Locus 35.0.003, which extended west of this cribbing. Locus 35.0.002, inside the ship and east of the port side, was identified as a reddish brown silt.

Initially, a trench was dug in Locus 35.0.001 to determine how the cribbing related to the ship. However, since the primary concern of the excavation was to obtain the necessary measurements and other information required to understand the parameters of the ship, this testing was abandoned after one day and all work in this lot was then concentrated inside the ship.

The ship extended north for approximately 100 inches. To the east it ran a length of about 120 inches, and to the south 37 inches. The western side of the ship ran diagonally across the lot southeast to northwest. From the western corner of its southern site, the western limit extended approximately 135 inches northwest into the north wall. Within this unit, beginning approximately 48 inches east of the west corner, part of the ship's stern was exposed. Initially, Locus 35.0.002 was taken down inside this stern section. As noted above, this locus was defined as a reddish brown silty sand approximately 14 inches thick across the eastern portion of the lot, diminishing to approximately 1 inch, 80 inches east of the northwest corner of the lot. Pockets of a light reddish brown clayey silt were dispersed throughout the locus. Locus 35.0.004 was below this and extended across the stern section; it was defined as a grey/brown silty clay. Locus 35.0.005 was deck planking in the southeast quarter of the unit.

After 35.0.005 was removed, the lot was quartered and two opposing units, 35.01 and 35.03 were excavated. The former was defined as a red/orange silty clay with intrusions of grey clay, rubble, oyster shell, and brick. The latter was described as a light reddish brown clayey silt with intrusions of black clayey silt, yellow wood chips, oyster shells, and brick. The thickness of this locus varied from 1 to 18 inches. Locus 35.01.003 was a grey/brown clayey silt with depths varying between 28 and 32 inches. Because of the irregularity of the ship's position in the lot, the quartering system did not work and was abandoned. As a result, the area inside the ship was referred to as 35.3/4.

Along the northwest corner, Locus 35.3/4.001 was defined as 44 inches along the north wall from the west corner. The matrix of this locus was interpreted as a brown/grey silty sand with wood shavings. It varied in thickness from 20 inches in the northwest corner to 2 inches at its eastern extent. In the middle of this locus, a deck beam was situated along the north wall. This locus was followed by Locus 35.01.002 which was defined as a reddish brown clayey silt. This locus extended across the lot both inside and outside the ship. Inside the ship, it covered the entire excavation varying in thickness slightly from 18 to 12 inches. Outside the ship, along the south wall, this locus with small pockets of red/brown silty sand mottled with grey silt and dark grey silt/sand was the dominant soil matrix in the landfill. This may well suggest a major filling episode occurring outside the ship with only an incidental overflow into the ship, a possible interpretation for the disparate thickness of the matrix between the two areas.

After the ceiling planking was removed exposing the frames, separate loci designations were given to the exposed fill areas. The frames in Lot 35 were lettered from south to north (A and B). There were two areas designated Locus 35.3/4.005 between frames A and B and Loci 35.3/4.006 between frame A and the wind transom. Both loci were a mottled grey/green/tan sandy silt with wood chips. After their removal, the recordation team measured the frames (see recordation section for further details).

Ship Structural and Fill Loci

Lot 31 (702SH) See Figure 7.22

Locus Number	Identification
31.0.001	Brownish black silt with inclusions of light grey clay. (6-21 inches thick).
31.0.002	Brownish red sandy silt with inclusions of wood chips. (7-16 inches thick).
31.0.003	Red brown sand with large pieces of wood and inclusions of black silt. (12-19 inches thick).
31.0.004	Wood chips and splinters mixed with red brown sand. Material appears to be primarily eighteenth century. (13-34 1/2 inches thick).
31.0.005	Red brown sandy silt with gravel and lenses of red sand. Soil contained articulated clam shells. (5-49 inches thick).
31.0.006	Greenish grey clay with pockets of gravel and white sand. Soil contained artifacts from the eighteenth century. (7-32 inches thick).
31.0.007	Black sand with inclusions of gravel. Fill contained early eighteenth century artifacts. Possibly ballast. (30-40 inches thick).
31.0.008	Wooden barrel.
31.0.009	Soil clean up after east wall slump.
31.0.010	Soil to the south of frame #178 (between breast hook and frame). Brown silt. (5-9 inches thick).
31.0.011	Brown sandy silt with inclusions of brown silt. Soil cleaning between frames 182 and 183. (6-10 inches thick).
31.0.012	Brown sandy silt. Soil between Port Hawes #193 and the stem #191. (10-13 inches thick). Thicker at top of frame.

Lot 31 (continued)

Locus Number	Identification
31.0.013	Brown sandy silt. Soil between frame numbers 206 and 207 on port side of hull. (7-14 inches thick).
31.0.014	Brown sandy silt, grading into greenish grey clay. Starboard side of hull. Soil between frames 184 and 185. (10-14 inches thick).
31.0.015	Locus between frames 178 & 179 on starboard side of hull. No space between frames, therefore no soil sampled.
31.0.016	Brown sandy silt grading into greenish grey clay. Soil between frames 207 and 208 on port side of hull. (11-14 inches thick).
31.0.017	Brown sandy silt grading into a brownish red sandy silt. Soil between frame numbers 179 and 180, on starboard side of hull. (12-14 inches thick).
31.0.018	Brown sandy silt grading into greenish grey clay with depth. Soil between frame numbers 124 and 187 on starboard side of hull. (5 1/2 - 9 1/2 inches thick).
31.0.019	Brown sandy silt. Soil between frame numbers 201 & 206. Port side of hull. (6-8 inches thick).
31.0.020	Brown sandy silt soil between frame numbers 208 and 209, on port side of hull. (3-6 inches thick).
31.0.021	No soil excavated between frame numbers 185 and 187. Frames are touching each other. Starboard side of hull.
31.0.022	Brown sandy silt. Between frame numbers 125 & 138. Starboard side of hull. (2-10 inches thick).
31.0.023	Brown sandy silt. Soil between frame numbers 209 (P.F.5) and 210 (P.F.6a). Port side of hull. (4-8 inches thick).

Lot 31 (continued)

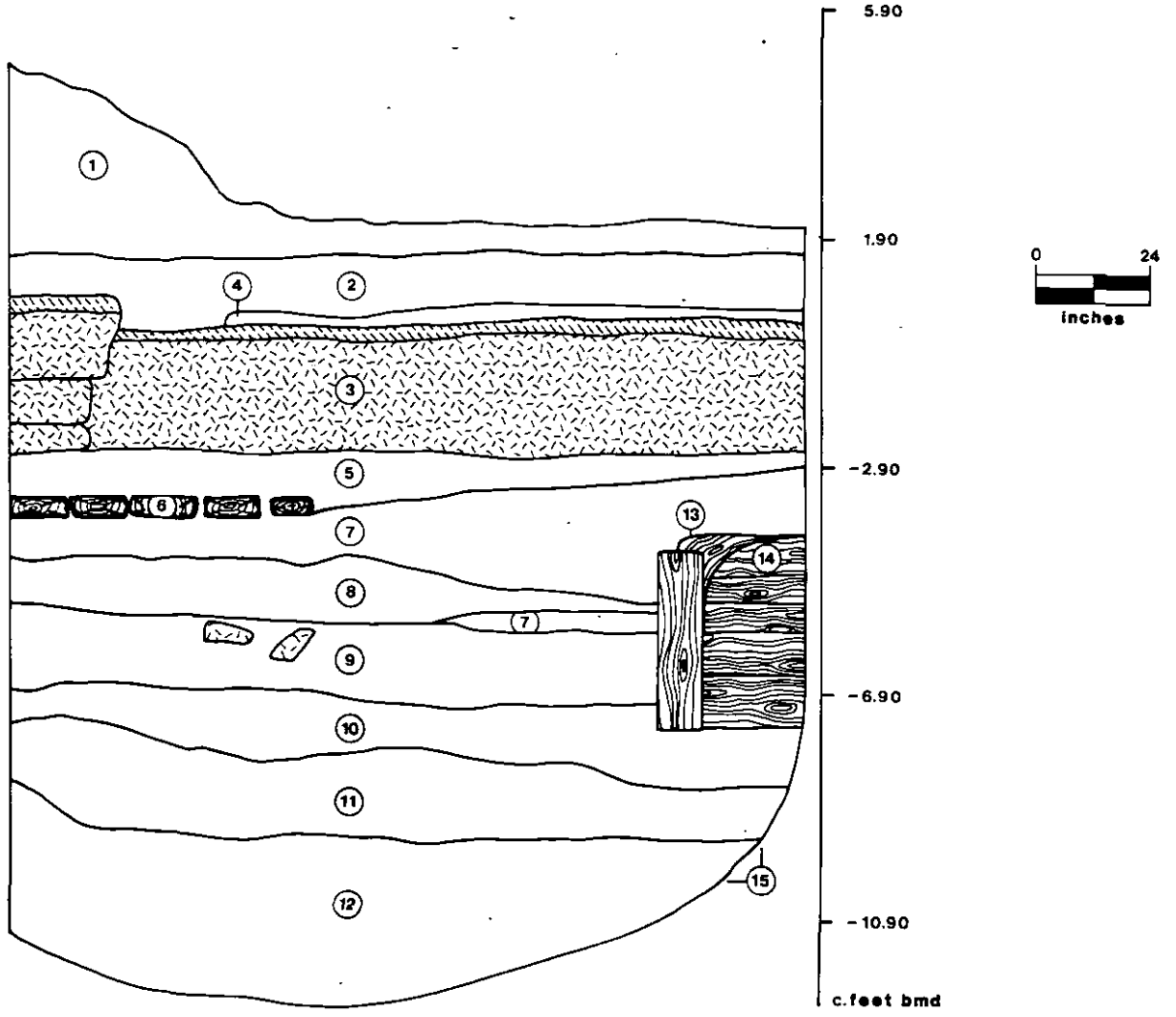
Locus Number	Identification
31.0.024	Brown sandy silt. Soil between frame numbers P.F.7 and 211 (P.F.8a). Port side of hull. (6-10 inches thick).
31.0.025	Brown sandy silt. Soil Between frame numbers P.F.9a and P.F.10a. On port side of hull. (2-6 inches thick).
31.0.026	Brown sandy silt. Soil between frame numbers P.F.11a and P.F.12a. Port side of hull. (10-14 inches thick).
31.0.027	South wall slump.
31.0.028	Pine needles with brown sandy silt and greenish grey clay. Interior of wooden barrel. (10-12 inches thick).
31.0.029	Collapsed wood deck planks. See scan sketch and triangulation measurements for loci thickness.
31.0.030	Wood ceiling planks overlying wood frames.

Lot 32 (703 SH) See Figures 7.23 and 7.24

32.0.001	Rubble above concrete floor. Nineteenth century. (6-10 inches thick).
32.0.002	Concrete floor of foundation. (1 ft. 1 in. thick).
32.0.003	Black sandy silt. Carbonized material. (2-10 inches thick).
32.0.004	Medium brownish grey sandy silt with lenses of black sandy silt.
32.0.005	Fill below weather deck. Reddish brown and dark brown mottled silty clay.
32.0.006	Reddish brown and dark brown mottled silty sand with lenses of decayed coral (2-17 inches thick).
32.0.007	Grey silty sand with inclusions of decayed coral and grey clay. (5-45 inches thick.

Figure 7.22
175 WATER STREET

The Ronson Ship, Lot 31
South Wall Profile



1. Brick and rubble
2. Brick wall
3. Cut stone wall
4. Tar
5. Black brown silt with rubble
6. Deck planks
7. Brownish red sandy silt with wood chips
8. Red brown sand
9. Brownish black sandy silt with wood chips
10. Red brown sandy silt with gravel
11. Green grey clay
12. Black sand with gravel
13. Hang knee
14. Bulk head
15. Ceiling planks

Stone
Concrete
Wood
Wood: X-section

Lot 32 (continued)

Locus Number	Identification
32.0.008	Whitish grey coral sand. (1 1/2-2 inches thick).
32.0.009	Soil between frames; letters A&B. Dark brown sandy silt with inclusions of coral, gravel, brick, shell, and stone. (6 inches thick).
32.0.010	Soil between frames; letters B&C. Dark brown sandy silt with inclusions of coral, gravel, brick, shell, and stone. (6 inches thick).
32.0.011	Soil between frames, letters C&D. Dark brown sandy silt with inclusions of coral, brick, gravel, shell, and stone. (6 inches thick).
32.0.012	Soil between frames, letters D&E. Dark brown sandy silt with inclusions of coral, gravel, brick, shell and stone. (6 inches thick).
32.0.013	Soil between frames; letters E&F. Dark brown sandy silt with inclusions of coral, gravel, brick, shell, and stone. (6 inches thick).
32.0.014	Soil between frames, letters F&G. Dark brown sandy silt with inclusions of coral, gravel, brick, shell, and stone. (6 inches thick).
32.0.015	Soil between frames, letters G&H. Dark brown sandy silt with inclusions of coral, gravel, brick, shell, and stone. (6 inches thick).
32.0.016	Soil between frames, letters H&I. Dark brown sandy silt with inclusions of coral, gravel, brick, shell, and stone. (6 inches thick).
32.0.017	East wall slump.
32.0.018	Weather deck and support beams.
32.0.019	Ceiling planks overlying frames.
32.0.020	Main deck and support beams.

Ship Matrix Description Per Loci

Lot 33 (704 SH) See Figures 7.25 and 7.26

Locus Number	Matrix Description
33.10.001	Removal of asphalt, rubble and concrete floor. (77 inches thick).
33.10.002	Dark brown to grey brown silty sand with intrusions of wood shavings and rocks (43 inches thick). (Note: charcoal lenses not recorded on locus sheet are found in profile).
33.10.003	Since redefined as coral and decomposed shell. (8 inches thick).
33.10.004	Decking planks.
33.11.001	Cleaning deck (20 inches thick).
33.11.002	Removal of collapsed deck in the southern part of the lot.
33.11.003	Removal of deck beams and decomposed coral (4-20 inches thick).
33.11.004	Removal of decomposed coral, grey sand and black silt. (10-20 inches thick).
33.11.005	Removal of breaker beam and lodge knee along the north and west wall.
33.11.006 (705 SH)	Decomposed coral (5-35 inches thick).
33.11.007 (705 SH)	Ballast and decomposed coral.
33.11.008 (705 SH)	Ballast below keelson with decomposed coral.
33.11.009 (705 SH)	Removal of ceiling planking and foot wales on west wall and floor.
33.11.010 (708 SH)	Matrix between frames N and O consisting of decomposed coral chipped wood with inclusions of grey clay and waterworn pebbles.

Figure 7.23
175 WATER STREET

The Ronson Ship, Lot 32
North Wall Profile

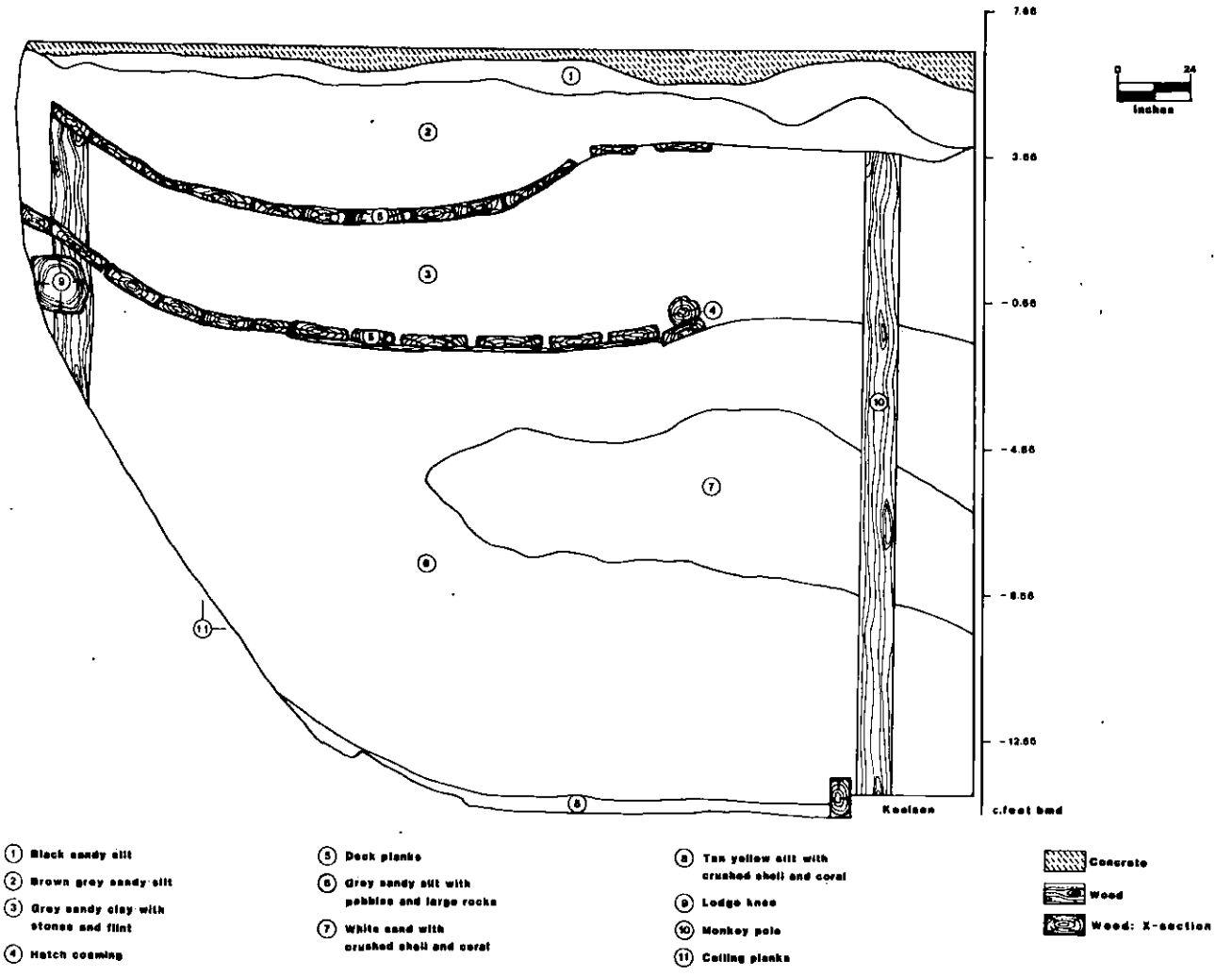
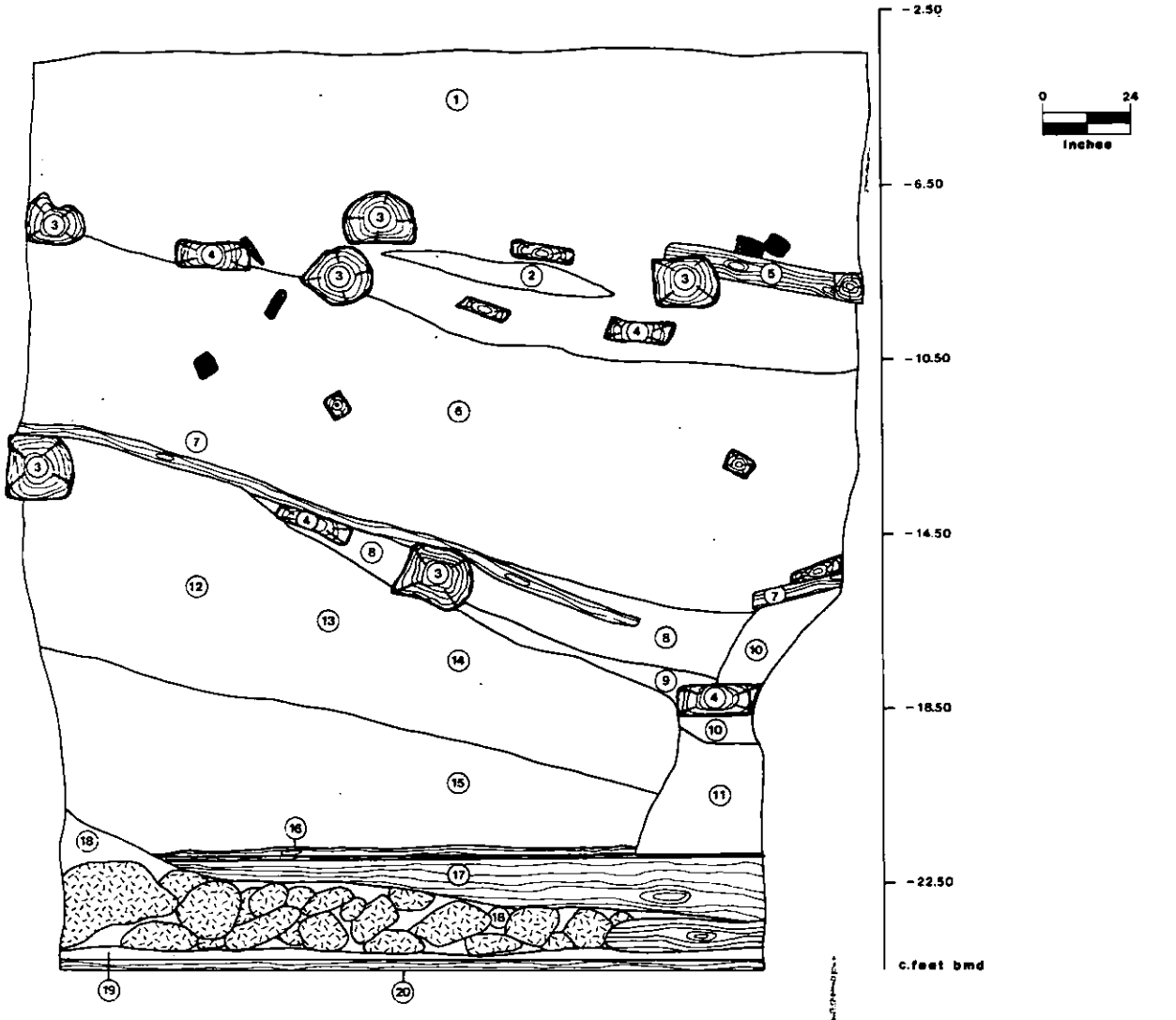


Figure 7.24
175 WATER STREET

The Ronson Ship, Lot 32
East Wall Profile

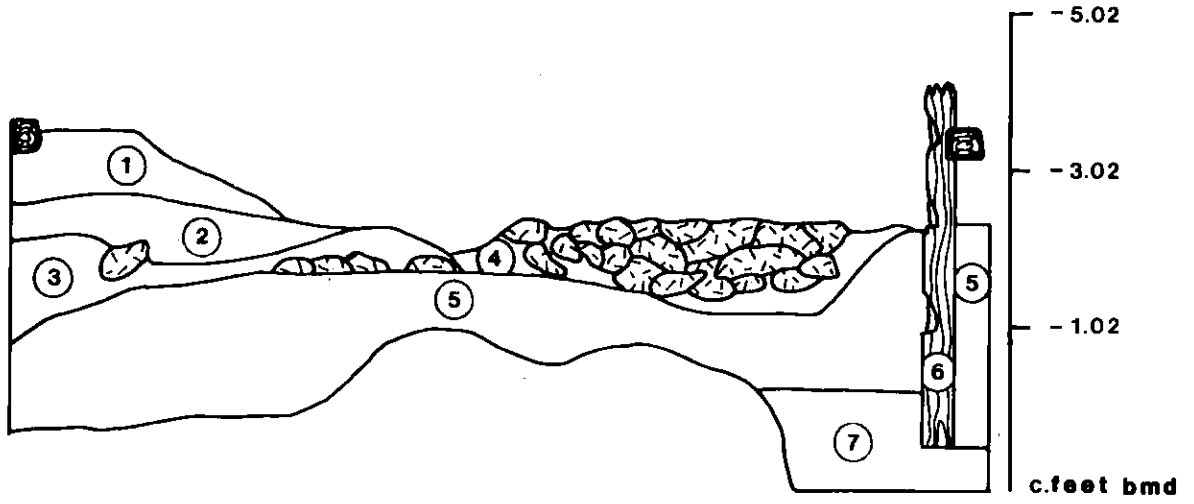


1. Brownish red sandy silt
2. Grey clay
3. Deck beam
4. Intermediate deck beam
5. Upper deck plank
6. Grey sandy clay with large stones and flint
7. Lower deck plank
8. Red silt
9. Grey silt
10. Grey clay
11. Grey fine sand
12. Light grey sand
13. Transition between 12 & 14
14. Dark grey sand
15. White crushed coral sand
16. Top of keelson
17. Keelson
18. Grey silt with cobbles
19. Grey silt
20. Ceiling plank

Stone
Brick
Wood
Wood: X-section

Figure 7.25
175 WATER STREET

The Ronson Ship, Lot 33
East Wall Profile





1. Dark brown silty sand
2. Light grey sand
3. Dark grey fine sand
4. Grey silty sand
5. White coral sand
6. Monkey pole
7. Keelson

Stone
Wood
Wood: X-section

An historic model for nineteenth-century mercantile development is applicable to the shifts occurring on the block. This model documents two stages of development. The first, the merchant specialist/middleman, an outgrowth of the colonial all-purpose merchant, evolved from this earlier merchant after 1815 to act as a retailer and wholesale-supplier in a developing commercial market. The second, a warehouse/distributor, developed after 1850 in response to the need to store and distribute goods in a time of increased availability of goods and a burgeoning market.

It is obvious that at least one commercial feature deposit represents the merchant specialist/middlemen, in this case a china and glass merchant in Lot 22. The dates for this deposit, most closely associated with an 1800 to 1808 occupation, anticipate the development suggested in the model. However, the early evidence for this specialized merchant on the 175 Water Street block, while interesting in terms of New York City's involvement in commerce, is incidental to the application of this historic model to an archaeological context. Mainly through negative evidence, a shift to the warehouse/distributor, the next stage of this development, is suggested from a privy deposit, dated from 1842 to 1865, in Lot 33. (This shift, too, appears to predate the historic model.)

As previously mentioned, these archaeologically discernible mercantile shifts suggest an archaeological model for determining the increasing commercialism of an American seaport district in the nineteenth century. Another possible variable in this model is the late adoption or availability in this district of city services in the form of piped-in water and sewage disposal. This is suggested by the fill dates for the block's excavated cisterns and privies. On the 175 Water Street block, adoption of these services after 1865 apparently occurred more than twenty years after water of good quality was available and at least ten years after sewers were theoretically installed throughout the city. This time lag in adopting city services--perhaps reflecting cost or the late extension of these services to commercial sections of the city--may be a variable in determining commercially urbanizing districts in the nineteenth century, but this needs to be tested further.

The approach to the archaeology of the 175 Water Street site was intended not only to expand our knowledge of New York's commercial development, but also to document the information available from an intensively utilized and perhaps highly disturbed urban site. While the initial hypotheses guiding this research were ultimately expanded to realize the site's research potential, many of the original research objectives were achieved. For example, chronologies were developed, landfilling techniques were documented, and economic data were recovered. Information from this investigation adds to the growing archaeological data base that documents New York's development from the seventeenth through the nineteenth centuries.

As a means to documentation and model formulation, the extensive artifact assemblage was tabulated and analyzed. The computerized data base, which is currently stored at the University Computer Center at the University of Massachusetts, is organized for further research; the artifacts and documentary data are housed at the South Street Seaport Museum.

While many facets of the commercial-urban situation and process are documented with data from 175 Water Street, additional research possibilities for the data appear almost limitless. The archaeological investigation of this site illustrates the growing awareness of the research potential of "salvage" archaeology.

SUGGESTIONS FOR FURTHER RESEARCH

Every artifact category developed for this investigation has been analyzed to some extent; however, the analytical techniques and research focus varied in intensity and sophistication. Methods ranged from simple comparison of numbers and percentages to the statistical elegance of a stepwise discriminant analysis. Similarly, the research objectives included the basics of feature dating and the complexity of developing an archeological model for determining patterns of mercantile development in a nineteenth-century American seaport district. It remains for future researchers to expand the research done for this report or, using this data base, investigate existing problems and those not yet considered.

It is hoped that the 175 Water Street data will be used comparatively with relevant sites both in New York and elsewhere. Along with 175 Water Street, several large New York City sites--Stadt Huys, Hanover Square, and Telco--fit into a chronological urban progression. Only by comparison with relevant sites such as these will the model proposed in this report be tested and refined. It is also anticipated that these data will similarly be applied to other models.

The 175 Water Street data offer unprecedented comparative material for future research. This includes research into trade networks and product availability as reflected in glass and ceramics. It also includes research into diet, species availability, and patterns of animal consumption and use as documented in the site's fauna and flora. The research value of these four artifact categories is indicative of the potential for much of the site data. The following suggestions for further research merely touch on this potential, and are mainly concerned with expanding the research done for the current analysis.

Ceramics and Glass

These were among the artifacts most intensively analyzed, and feature material received the most in-depth analysis of all; yet, several analyses might refine the dating and identification of feature deposits. A stratum by stratum analysis, as suggested by the ceramic analyst, might accomplish this, as might a function analyses of bottles. This latter possibility was suggested by the success of this analysis in identifying a mid- to late-nineteenth-century warehouse deposit. The glass analyst has suggested that cluster analysis might reveal primary domestic components of low archaeological visibility within redeposited fill or a primary commercial deposit.

As will be discussed below, in addition to documenting the landfill process, this investigation developed a basic tool for urban research and analysis by providing archaeological criteria for distinguishing between domestic and commercial deposits. This is a distinction based mainly on patterns of use or wear on ceramic and glass vessels. Feature analysis based on these distinctions archaeologically defines nineteenth-century American commercial development. It also suggests an archaeological model for determining increasing urbanization as it is represented on a commercial block in a nineteenth-century American seaport.

In theory, the factors just enumerated are purely archaeological considerations. To recover much of this information requires asking the right questions of the right data. However, preliminary and ongoing historical research provided the guidelines, hypotheses, and elaborating data for this investigation. This independent resource provided models and theories that expanded the archaeological data and suggested relevant questions. Historical documentation and archaeology together refute, corroborate, or augment the information that each offers.

To recover data to successfully complete the archaeological investigation of this site, four months were spent in the field and, with some overlap with fieldwork, one year was devoted to laboratory analysis. The yards of six Water Street and four Front Street lots were cleared and excavated in a two-part testing and mitigation program. Mitigation was conducted with an explicit sampling strategy to ensure that all yard features were sampled and that one quadrant of every yard, including the features in that quadrant, was excavated extensively. These yard excavations documented more than fifty-five occupation-related features and also revealed a massive timber wharf/grillage, a landfill construction that apparently supported, and continues to support, most of the block's Water Street properties.

In order to test for other landfill constructions and river bottom, a backhoe was used to dig four deeptests. It was in one of these tests that the exterior port side of the Ronson Ship was first exposed. Ultimately, it was found that this aged 92 foot merchant vessel had been recycled and tied into a bulkhead system to serve as cribbing for the eastern block limit.

The fill from the ship, two deeptests, and many of the deepest levels from feature deposits served as samples of the landfill used to make the block in the mid- to late-eigthteenth century. Data from these primary, or original, landfill deposits indicated that the eastern segment of the block was actively being filled by 1750. However, this fill process, apparently structured by the wharf/grillage to the west and, by 1754, the Ronson ship and associated bulkhead to the east, was a slow, long-term process rather than the relatively rapid fill maneuver suggested from historical documentation. In some yards, landfilling may not have been complete until 1790. The basic fill matrix was a trash-based, organic material often including shell, wood chips, and leather, all common components of harbor fill. Another component was decomposed coral sand, a ship's ballast, also characteristic of harbor build-up.

Features in several yards suggested additional, or secondary, filling after the settling of new-made land apparently formed pockets where stagnating, pestilence-breeding water collected. This is most strongly suggested by a box/cofferdam-like feature in Lot 20, a domestic deposit, and a ceramic concentration in a pit or depression in Lot 23, a commercial deposit. Both are dated between 1795 and 1820 or 1830. Faunal and floral analyses suggest that the domestic deposit may represent a summertime fill episode. This was both a time and a season when yellow fever epidemics prompted filling of these trouble spots.

Computer analysis effectively handled the site's large volume of recovered artifacts. The investigation produced over 310,000 tabulated artifacts and approximately seventeen tons of weighed bone, shell, and construction material. This artifactual material was organized into nine categories: glass, ceramics, small finds, coins, fauna, flora, leather, pipes, and construction materials. Of these, all but nonmetal construction material were analyzed in some detail. However, analysis focused mainly on artifacts from feature deposits and selected deeptests, and centered on ceramics and glass.

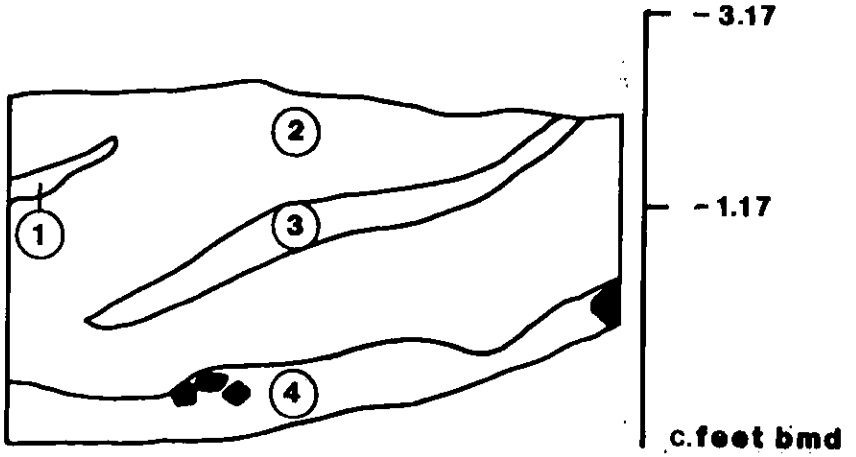
Based on these ceramic and glass analyses, occupation-related deposits from the features provided a chronological framework for the block's post-fill development as well as information to identify three deposit types. Two of these, comprising mendable or nearly whole ceramic and glass vessels, were considered "primary" deposits attributed to the domestic or commercial activities of a lot's occupants. The other, a redeposited fill, was a fragmentary, mixed, trash-based soil that was perhaps taken from elsewhere in the lot and deposited in an abandoned feature, often to fill it quickly.

As noted above, the archaeological documentation of the site's nineteenth-century mercantile shifts and indications for intensifying commercial urbanization is based mainly on the identification of primary deposits. Glass and ceramic analysis indicated that the bases of vessels from a primary deposit related to domestic, or household use showed evidence of wear. Those from commercial inventories, such as the china and glass stores in Lot 22, showed little if any wear, suggesting discard after breaking in shipping or while on display.

Analysis of wear patterns and selected tests applied to further identify deposit types suggest that a shift from mainly domestic to mostly commercial deposits occurred on the block sometime between 1795 and 1830. In addition to wear analysis, the tests used to identify deposits and therefore determine shifts include a modification of South's Carolina Artifact Pattern analysis and a stepwise discriminant analysis, the former quite definitive, the latter less so.

Figure 7.30
175 WATER STREET

The Ronson Ship, Lot 35
East Wall Profile





(1) Light reddish brown grey silty sand

(2) Light red brown clayey silt

(3) Light grey brown silty sand

(4) Dark green grey sandy silt

Brick

CHAPTER 8: SUMMARY AND CONCLUSIONS

(Joan H. Geismar)

By definition, since archaeological investigation preceded site development, the 175 Water Street project is salvage archaeology. Yet the research objectives, the site-specific information, and the research potential for the data recovered from this investigation expand this definition.

The scope of the investigation is in part attributable to the excellence of the support system provided by the developer during fieldwork and laboratory analysis. It is also due to the caliber of the historic research that was part of the project and the analystic detail made possible through the computer. And finally, it reflects the current state of archaeological inquiry and the research goals of those involved in historical archaeology in general, and urban historical archaeology in particular. All these factors have lifted this project out of the realm of salvage.

On a site-specific level, the archaeological investigation of 175 Water Street provides information about the making and developing of this commercial seaport block. In the larger context, it suggest patterns of urban development in a commercial district that are applicable to other similar blocks. Its potential, therefore, goes beyond the site-specific to that of the theoretical. On the other hand, site data applied to models of nineteenth-century mercantile development illustrate a case of applied archaeology. A brief summary and description of the methods and results of this application is presented here.

Archaeological data from this investigation document several eighteenth-century landfill techniques and suggest the engineering capabilities of the block's land-makers. They also indicate the availability of wood in the eighteenth century and the readaptation to this resource made by colonials employing ancient landfill techniques, many of them documented at Roman and Medieval European sites. At least in part, the block's land reclamation suggests a commercial motivation and, since sections of the block were obviously filled cooperatively, implies interaction between the members of New York's eighteenth-century merchant elite who apparently organized the landfilling.

This cooperative fill effort was suggested when backhoe excavation exposed and documented a unique nautical artifact, a derelict merchant ship incorporated into the eighteenth-century landfill process. The ship was found to extend across five separate water lot grants, all of them owned by New York merchants. The vessel's construction, materials, and design provide unprecedented information about late-seventeenth or early-eighteenth-century methods of shipbuilding. The presence of tropical teredo, or ship worms, in the ship's outer sheathing suggests its participation in a Caribbean-New York trade network. Except for the site itself, which is an artifact of the city and its involvement in world trade, this ship is the most spectacular single artifact recovered during the excavations. However, in a sense, the glass or ceramic sherd, while obviously less spectacular, offers data in kind.

Lot 34 (continued)

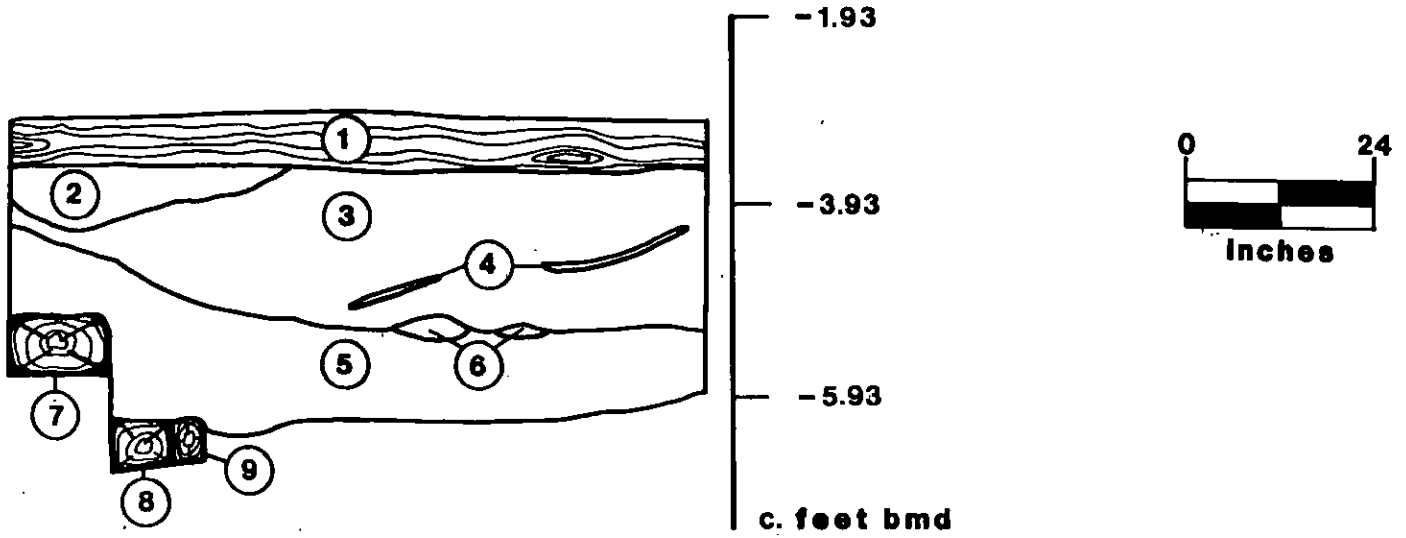
Locus Number	Matrix Description
34.01.001	Dark grey silty sand with inclusions of brick, mortar, oyster shell and wood chips (4-7 inches thick).
34.03.001	Dark grey silty sand (8-11 inches thick).
34.05.001.1	Dark grey silt with sand with inclusions of grey clay and tan sand (7-20 inches thick).
34.05.001.2	Test trench: dark grey silty sand with wood chips, flint and coral (35 inches thick).
34.05.002	Wood at bottom of 34.5.001 (dark beams)
34.05.004	
Layer 1	Ballast? Light grey sand with silt with inclusions of boulders, and nodules and fragments of flint (4-31 inches thick).
Layer 2	Brown silty sand with gravel (4-18 inches thick).
Layer 3	Grey clay (2-10 inches thick).
Layer 4	White decomposed coral sand (3 inches thick).
34.05.005	DOES NOT EXIST
34.05.006	Dark grey/brown sandy silt from between frames 7 and 8.
34.05.007	Dark grey/brown sandy silt from between frames 8 and 9.
34.05.008	Dark grey/brown sandy silt with flint and shell from between frames 9 and 10.
34.05.009	Dark grey/brown sandy silt from between frames 10 and 11.

Lot 35 (707 SH) See Figures 7.29 and 7.30

Locus Number	Matrix Description
35.0.001	Dark grey/black silty sand.
35.0.002	Reddish brown silty sand (1-14 inches thick).
35.0.003	Dark grey/black silty sand.
35.0.004.1	Grey brown silty clay. Clayey silt (13-15 inches thick).
35.0.004.2	Grey brown silty clay (10-11 inches thick).
35.0.005	Decking planks in the southeast quarter.
35.01.001	Red/orange silty clay; grey clay/rubble with inclusions of rubble and oyster shell and brick.
35.01.002	Light reddish brown clayey silt with intrusions of black clayey silt, yellow wood chips, oyster shells and brick (1-18 inches thick).
35.01.003	Grey/brown clayey silt (28-32 inches thick).
35.03.001	Mottled red/brown clayey silt with green/grey silty sand (6-10 inches thick).
35.3/4.001.1	Mixed light reddish brown clayey silt with dark green/grey organic sandy silt smelling of ammonia (1-6 inches thick).
35.3/4.001.2	Dark grey/black sandy silt (11-13 in. thick).
35.3/4.002	Decking planks, beams and lodge knee.
35.3/4.003	Cleanup before wood removal. Three matrices defined: red/brown silty clay, dark grey/green silty sand, and grey clay.
35.3/4.004	Wood removal (ceiling planking).

Figure 7.29
175 WATER STREET

The Ronson Ship, Lot 35
North Wall Profile



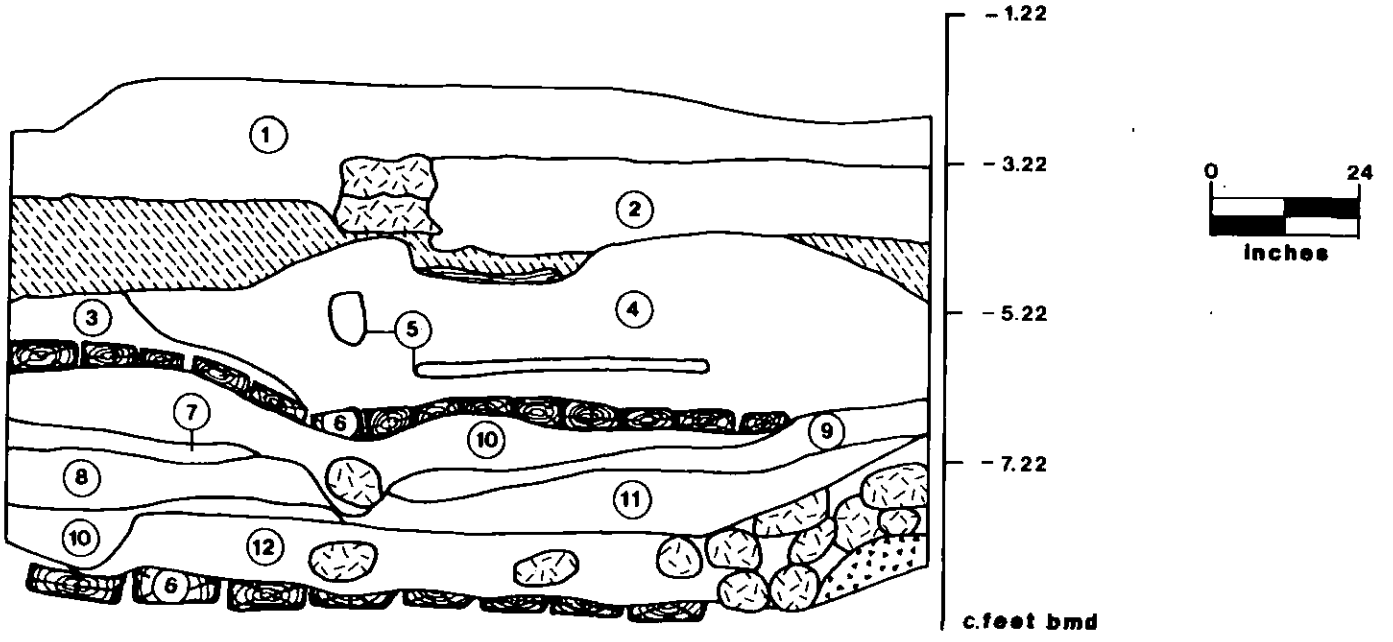
1. Deck beam
2. Reddish brown silty sand
3. Light reddish brown clayey silt
4. Lens of light grey sand
5. Dark greenish grey sandy silt
6. Dark brown silty clay
7. Transom knee
8. Waterway
9. Molding

Wood Wood: X-section

Locus Number	Matrix Description
35.3/4.005	Fill between frames A and B. It was a mottled grey/green/tan silty sand with wood chips.
35.3/4.006	Fill between frame A and wind transom mottled grey/green/tan silty sand with wood chips.
34.4.001	Light reddish brown clayey silt with pockets of organic material and tar.

Figure 26
175 WATER STREET

The Ronson Ship, Lot 33
North Wall Profile

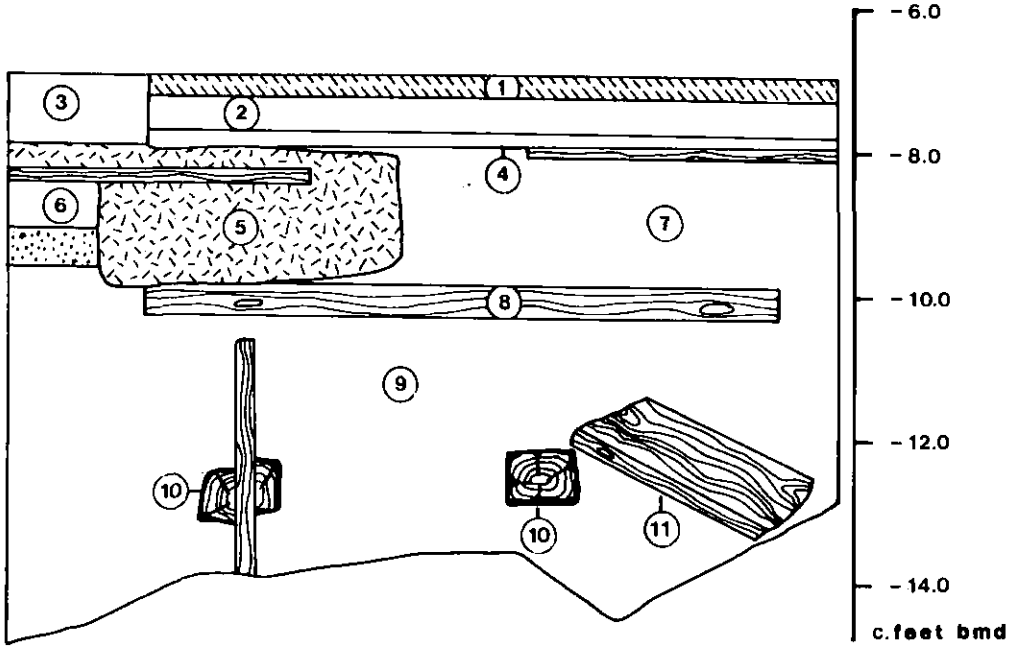


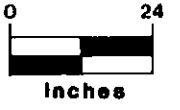
1. Brick wall
2. Tar paper
3. Black silty sand
4. Grey sandy silt with cobbles and brick
5. Charcoal
6. Deck planks
7. Grey clayey sand
8. Wood chips and cobbles
9. Charred wood
10. Grey silty sand
11. Coral and cobbles
12. Cobbles

Stone
Coral
Concrete
Wood
Wood : X section

Figure 7.27
175 WATER STREET

The Ronson Ship, Lot 34
East Wall Profile



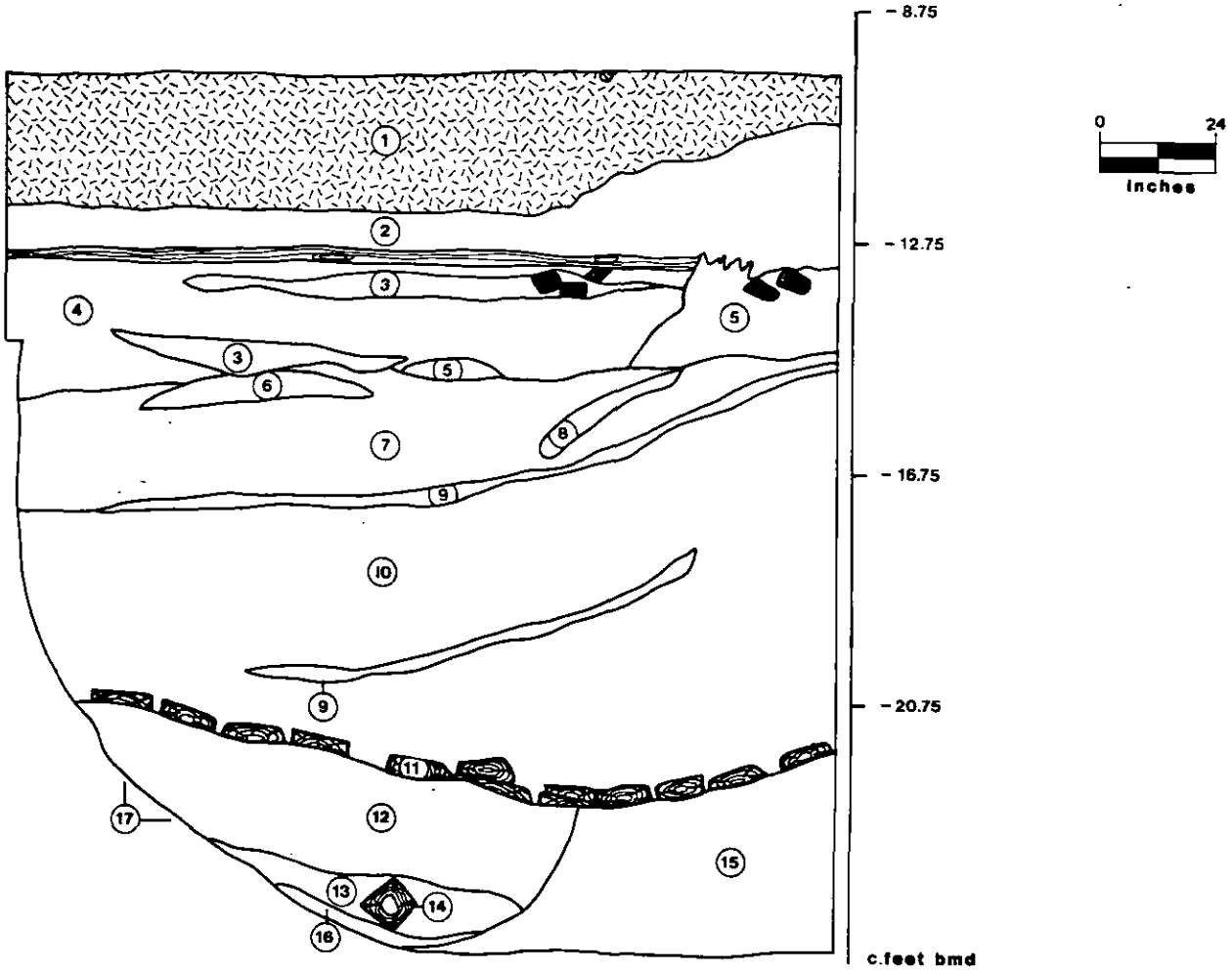


1. Concrete block wall
2. Red silt with mortar
3. Brick and concrete ledge
4. Asphalt
5. Stone wall
6. Grey and brown fine sand
7. Grey and tan silty sand with brick and mortar
8. Foundation beam
9. Grey silt with oyster shell
10. Deck beam
11. Mizzenmass step

Concrete
Stone
Mortar
Wood
Wood: X-section

Figure 7.28
175 WATER STREET

The Ronson Ship, Lot 34
North Wall Profile



1. Cut stone wall
2. Broken concrete floor
3. Red grey sand
4. Grey black fine sand
5. Black silt stain
6. Light grey clay
7. Dark grey fine silt
8. Tan silt with decomposed wood
9. Leather and wood chips
10. Grey silt with oyster shell
11. Collapsed deck planks
12. Brown silty sand with gravel
13. Grey clay
14. Lower deck scupper
15. Brown silty sand with stones, flint, and coral
16. White coral sand
17. Ceiling planks

Stone

Wood

Wood: X-section

Lot 33 (continued)

Locus Number	Matrix Description
33.11.011 (708 SH)	Matrix between frames N and M consisting of decomposed coral, chipped wood with inclusions of grey clay, and waterworn pebbles.
33.11.012 (708 SH)	Matrix between frames L and M consisting of decomposed coral, waterworn pebbles with inclusions of wood and grey clay.
33.11.013 (708 SH)	Matrix between frames K and L consisting of decomposed coral with inclusions of grey clay and waterworn pebbles.
33.11.014 (708 SH)	Matrix between frames J and K consisting of decomposed coral, grey clay, waterworn pebbles, and chipped wood inclusions.
33.11.015 (708 SH)	Matrix between frames I and J consisting of decomposed coral with inclusions of chipped wood and grey clay.
33.11.016 (704 SH)	No information. Locus came from Box with Mast Hole. Soil discarded accidentally.

Lot 34 (706 SH) See Figures 7.27 and 7.28

34.0.001	Rubble fill down to floorboards (82 in. thick).
34.0.002	Crosshatched floorboards above landfill (3.5 inches thick)
34.0.001	
Layer 1	Mixed grey/black fine sand with inclusions of red/grey clay sand, black silt stain and red brick.
Layer 2	Dark grey fine silt with inclusions of light grey clay and tan silt with decomposed wood (10-14 inches thick).
Layer 3	Medium grey silt with oyster shell (24 to 28 inches thick).
34.0.001.2	Dark brown to medium grey silty sand with intrusions of oyster shell.

Then too, using these analyses, the unidentified primary deposit in Feature 4 might be classified. With this research, the shift from a mainly domestic to mainly commercial city block could be more accurately dated and defined.

A detailed analysis of a comprehensive sample of the block's ceramics and glass from general lot fill is also recommended. Analysis of these fragments, which was limited to gross identification, would refine the dates for this yard fill.

In addition to the site-specific data available, the ceramics and glass offer other research tools. For example, the inventories from the china and glass store in Lot 22 might be compared with artifacts recovered from chronologically compatable rural and suburban sites to both identify the objects from these sites and suggest trade networks extending beyond the 175 Water Street area. Similarly, technological data from bottles recovered from 175 Water Street could provide manufacturing and dating information for bottles from other relevant sites.

Fauna

While the report of major domesticates from selected features provides faunal data unique for urban American sites, the analysis of this category is far from complete. There is a wealth of economic information to be recovered from the bird, small mammal, and fish material from the site. Birds and small mammals from privy deposits have been identified and tabulated; fish from these features were partially tabulated but not identified. By identifying and quantifying fish remains, a comparative analysis of species could be correlated with ceramic and glass chronologies. This would provide data to trace changing patterns of fish availability and could conceivably indicate past river pollution.

A general comparison of edible and non-edible species over time could be integrated with the model for the block's commercial development. For example, cat bones are apparently an important faunal component at the site. The apparent preponderance of this animal perhaps can be explained by cat populations introduced to fight a growing rat problem as the site became more commercial. Analysis correlated with chronologies would test this hypothesis.

Flora

Neither macro-flora from lot fill nor micro-flora in general have been tabulated. However, eighteen micro-floral samples have been analyzed, and the results demonstrate the caliber of information available relative to site formation and diet. It is suggested that analysis of the micro-flora from selected features, particularly the privies, would provide information relating to diet and species availability over time.

Construction Materials

Nails and window glass counts have been used in organizing four features for comparison with the Carolina Artifact Pattern model; other than this, no analysis of these artifacts has been undertaken. Since only window glass, nails, and building construction hardware have been tabulated by counts (other materials, such as brick and mortar were weighed in the field and discarded), most analysis would be limited to these objects. However, an intra-site comparison of nailtypes, correlated with ceramic and glass chronologies, would not only indicate changes in nail manufacture over time as represented at this New York site, but would perhaps suggest the caliber of workmanship found in the buildings these nails were used to construct.

Carolina Artifact Pattern Analysis

As mentioned above, the data from four features were organized for this analysis and the results supported the identification of feature types. It is suggested that other site features be similarly analyzed since nuances from this analysis may suggest identification for the type of commercial activities found on the block.

Discriminant Analysis

It was noted in the discussion for this analysis that a reorganization of the variables, mainly to include a wear-pattern variable and perhaps a different choice of classifying models, would help to define variations among commercial deposits.

Ship

Ongoing and future analyses are described in Chapter 7.

It is anticipated that the 175 Water Street data, available at the South Street Seaport Museum, will be the focus of analyses such as those suggested here, and of many others. In its variability, quantity, and quality, it is a collection that warrants research attention for years to come.