64 PEARL STREET: AN ARCHAEOLOGICAL EXCAVATION IN 17TH CENTURY LANDFILL

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PREFACE

The circumstances which brought about the archeological investigation described in this report are unusual. The five properties on the Fraunces Tavern block were threatened with demolition for several months before the Conservancy acquired them in May of 1978. The purchase was made possible with the assistance of The Vincent Astor Foundation and Warner Communications, Inc. The buildings are part of a designated historic district in lower Manhattan which comprises a single block, located on Pearl and Water Streets between Broad Street and Coenties Slip. The Conservancy's properties face the Slip, and are located on the site of what is believed to be the earliest landfill in New York City. The buildings, vernacular commercial structures built as warehouses beginning in the 1830's, and expanded throughout the nineteenth century, are currently undergoing restoration. The Conservancy selected a developer who has signed a long-term net lease for the buildings, and is converting them to apartments on the upper floors and commercial space on the ground floor. In early 1982, the apartments will be ready for occupancy.

The Conservancy sensed that a great and rare opportunity to learn about the daily lives of early New Yorkers existed when the buildings were vacant and a developer was being sought. Our planning for the dig began when we had secured the properties. An historic structures report completed by The Ehrenkrantz Group in 1979 described the rich cultural resources which may have been beneath the buildings, and recommended that further archeological investigations be carried out. The Conservancy raised funds for the archeology project, and sponsored the dig beneath the most stable of the five buildings, 54 Water Street/64 Pearl Street, in the early spring of 1980.

The New York State Council on the Arts provided $4,000.00 to match a grant-in-aid of $4,970.00 awarded to the Conservancy and administered by the New York State Office of Parks, Recreation and Historic Preservation. We are very appreciative for the support and cooperation of these public funding sources. In addition, we are proud of the excellent efforts of the consultant team, led by Nan A. Rothschild and Arnold Pickman.

New York Landmarks Conservancy

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On the completion of the field work and analyses, Paul Huey was, as usual, very generous with his time and knowledge. Diana Rockman gave excellent advice and was patient about scheduling. Meta Janowitz, Nancy Stehling and Kate Morgan were very helpful with artifact identifications. Phyllis Dillon of the Haye Foundation analyzed the fabric, Roberta Taylor of Temple University identified plant seeds, and Tom McGovern of Hunter College assisted in identifying faunal remains. Eve Jewelers tested the non-gold pins. None of these is, of course, responsible for any errors in the report. We are also grateful to an exceedingly tolerant crew, working in very difficult circumstances.

Nan Rothschild
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INTRODUCTION

Background (figure 1)

64 Pearl Street - 34 Water Street is a six story trapezoidal brick building, built in 1858 and located in lower Manhattan, New York City, in a block bounded by Pearl, Broad and Water Streets and Coenties Slip. The block has been designated an Historic District and is listed on the National Register of Historic Places. It comprises 16 structures, all dating from the early to middle 19th century, except for one late 19th century structure. The best known building, the Fraunces Tavern, is an early 20th century reconstruction of an 18th century building.

In 1979, the New York Landmarks Conservancy and the Sons of the Revolution, owners of the majority of these structures, were planning the restoration of the eastern half of the block (those on the western half having previously been restored). Since the restoration would necessarily involve some disturbance of the original ground surface on which the buildings were constructed, known to be very early land fill, the Landmarks Conservancy recognized that there would be an impact on potentially significant archaeological resources. Therefore, they contacted one of the authors

(N. Rothschild) to arrange an evaluation of some portion of the archaeological deposits to be affected.

The plans available at the time of excavation (Jacobs, dated 2/19/80 and conversation with Alfred Wen) indicated that the only ground disturbance would take place in limited portions (see plans) of the basements of the buildings fronting on Coenties Slip. Installation of an elevator and two chutes in an existing air shaft and structural repairs to facades would cause this disturbance. Optimally, archaeological testing should have taken place in these areas. However, the consulting architect, Theodore H. M. Prudon, thought that the condition of these structures made them unsafe for excavation. Because 64 Pearl Street was adjacent to the area in which the greatest ground disturbance would occur and was structurally sound, the test excavations were placed in the basement of this building.

The test excavations were first planned for Spring, 1979 as part of a field methods course being taught at Hunter College. However, due to various problems, the project did not get underway until a year later, March 1980. At this time, it was no longer feasible to incorporate the project into a field class. Therefore, excavation was carried out by a crew of experienced archaeological excavators under the direction of Arnold Pickman. Dr. Nan A. Rothischild was the principal investigator for this project. The project was sponsored by the New York Landmarks Conservancy and funded by the New York State Council on the Arts and a matching grant-in-aid from the Historic Preservation Fund of the Department of the Interior. (In New York State, the matching grant program is administered by the Division of Historic Preservation within the State Office of Parks and Recreation.)

Research Focus

It was considered appropriate to investigate the archaeological deposits by means of several small test cuts, rather than excavation of a large area. The latter approach could provide data on any earlier structures present in the eastern half of the block or any sub-surface archaeological features present in former backyard areas. However, an important consideration was the need to preserve archaeological resources in this Historic District which would not be impacted by construction under the existing restoration plans. Opening large excavation areas did not seem justified given the relatively small area which would be disturbed to any depth. We therefore decided to make the focus of the project the nature of the fill itself. We believed that the small scale excavations planned would provide this type of data.

Research questions asked of excavations such as these are somewhat different from those considered for excavations which take place on original ground surfaces. Since 64 Pearl Street is known to be built on landfill, a series of questions about the composition and nature of this fill as well as the date or dates and processes of filling seemed most significant. We also considered that two other types of cultural material might be present on the site in addition to the fill. Structural remains of a documented earlier building (and another which is more ambiguously documented) on the site was one possibility. Another type of archaeological deposit would consist of builder's trenches, trash heaps and other concentrations of material from the existing or earlier structures. The excavations were designed to recover information from all three types of cultural remains, as discussed below.

A number of specific questions were considered which we hoped to answer

by means of these excavations. Some of these were related to the history and morphology of the site: How many buildings existed on the site prior to that built in 1858? What was the extent of the structure known to predate the one built in 1858 and when was it built? When was the fill deposited? How was it deposited (was cribbing or any other special technique used)? Where, precisely, was the original shoreline?

Anthropological questions were also considered: What was daily life like (as seen in the archaeological record) for inhabitants of this block in the 17th century, and how has it changed through time? In particular, are there changes in diet, technology, trade or refuse disposal patterns (Bowen: 1975, Kardas and Larrabee 1972; Schiffer 1977) that can be observed through analysis of material recovered from either fill or post-fill deposits?

Archaeological Significance of Fill Deposits

The potential of fill as an archaeological resource is gradually being realized (Salwen 1978). The influence of national and international events (e.g. change from colonial rule and the opening of the Erie, and Delaware and Hudson canals) would be expected to affect archaeological material found in fill or other deposits. The rate of adoption of innovations (new ceramic styles, nails and tools, for example) would also be reflected. One might expect such changes to occur more quickly in this location at the very center of import-export shipping activity than in outlying or rural areas (Salwen, Bridges and Rothschild 1980). A cumulative body of comparative material with which to answer such questions is gradually being gathered by historical archaeologists while models for the interpretation of these data are being developed (South 1977; 1978).

Questions can be asked that are specific to the occurrence of the filling itself. Since the making of land by filling represents a statement as to the value of the land, one can expect to see reflections of cultural processes in the choice of areas to be filled. Land filling is a signal that there is something happening on, or projected for, the adjacent land. Theoretically one should be able to determine the important activity centers in a community by noting where the first land was made. In this case it is significant that the first area to be filled in Manhattan was the two block area at the southern tip (Dukes Plan 1661; Miller Plan 1695), adjacent to the heart of New Amsterdam and early New York, and the location of the first Town Hall, or Stadt Huys.

The composition and sources of fill may raise other interesting questions. Fills are known to have been composed of a variety of materials, including, at Liberty State Park, old locomotives. However, all laws of common sense and energy conservation suggest that people will use the closest available suitable material. It seems likely that some of the earliest filling of the East River shoreline, which occurred in front of the State House, came from an adjacent hill (Innes 1902). One may also be able to infer broad cultural or social conditions from material found in fill. For example, Kardas and Larrabee suggest that when fill has little building debris in it, one can assume "frontier" conditions (1979). This statement may be too simplistic; we need to know more of the whole cultural system of refuse disposal practices before making such an assertion, but hypotheses such as these can be tested using fill and other supplementary material.

The cultural material within fill represents an accumulation of material from a given period of time in a given area. It is material

without provenience, as material in a midden or dump is without provenience, but it can be very informative if it can be dated and analyzed as "a slice of life" from a particular point in time and space.

Documentary History: Background

Before excavation, documentary research was undertaken for several purposes. One was to place the building in historical perspective, and to consider the changing land use patterns in this area. The other was to get as much detailed information as possible on land transfers, the number of buildings on the lot over time, their sizes, functions, and any alterations involving the basement or foundation.

Most of this research was done by Prudon & Burditt for the Historic Structures Report (1979) prepared for the Conservancy as part of the New York State Division of Historic Property requirements for restoration funding. Some pre-excavation documentary research was also done by Roberts (1979). The two reports used a variety of primary and secondary sources: Stokes (1915-1928) and other similar compendia; New York City Tax Assessments, Land Records, Department of Buildings Records, Minutes of the Common Council, and Abstracts of Wills. Most of this information has been summarized in the Historic Structures Report. We will outline it briefly, and describe that which is relevant to our research questions and archaeological purposes in greater detail.

The southern tip of Manhattan was the focus of New Amsterdam. Fort Amsterdam, most important commercial buildings (those of the West India Trading Company), the Stadt Huys, and the greatest concentration of population were all located within three blocks of the tip (Castello Plan 1660). A great deal has been written of the early development of New Amsterdam and

New York (Albion 1939; Bridenbaugh 1968; Disturnell 1837; Cresson 1912; Flick 1962; Harrington 1964; Lockwood 1976; Lossing 1884; Roter & Livesay 1971; Wilson 1893; Van der Zee & Van der Zee 1978). Lower Manhattan seems always to have had at least a partially commercial function. In the 17th century, both in New Amsterdam and New York, residential and some commercial structures were found along Pearl Street; in the 18th century, owners often lived above their businesses, while in the 19th century, either purely commercial buildings or structures combining a series of apartments above a commercial main floor were common.

The entire area was linked most closely to the development of various forms of transportation. Even though Pearl Street was no longer on the water front after the 17th century shore line filling discussed below, it was still involved in activities related to commerce. In later periods Pearl Street was particularly noted as a dry goods and hardware center (Disturnell 1837:12-13).

Before 1820 the major form of transport was by ship, and most shipping was trans-oceanic (Johnson ms., n.d.:14). While shipping remained a dominant activity after this time, much of it now related to domestic commerce as well as trade with other nations, especially during the War of 1812 and after the opening of the Erie and the Delaware and Hudson canals in 1825 and 1829 (see Prudon & Burditt for a fuller discussion of these events). Later events such as decreased trade during the Civil War, competition with other shipping routes (on the Gulf and West coasts), and the development of train transport affected the state of southern Manhattan as a port. The volume of trade was reduced, and the center of transportation was shifted to the West Side of Manhattan where "practically every important railroad in North America has a terminal in New York . . . at the most desirable

locality" (Cresson 1912, cited in Prudon & Burditt 1979:9).

This extensive development of the West Side of Manhattan continued into the early 20th century. The East Side retained a pattern of mixed land use until the late 1940's when it became dominated by New York's financial district during a post-war period of affluence and construction (Prudon & Burditt 1979:10).

Documentary Research: The 64 Pearl Street Lot

Subsequent to our archaeological excavations, we carried out additional documentary research to supplement that contained in the historic structures report. This provided a more complete picture of the history of the filling of the lot.

Prior to 1686 the south side of what is now Pearl Street was the East River shore line. The first indication of land-filling activities on the block on which 64 Pearl Street stands is provided in the Minutes of the Common Council. Although not recorded until May 4, 1688, it was on September 15, 1686 that the city surveyors were ordered to survey and lay out lots, "beginning ffrom ye weigh house to ye Citty Hall . . . Eighty foot long into the Dock and about four and twenty ffoot broad leaving sufficient space for ye Street . . . also to lay out ye street Ranging with ye Here Graft . . ." (1905 vol. I:195-196, original spelling retained). The reason for the laying out and sale of these lots was to raise money to pay the debts of the City government (Stokes I:177, 1918). The desirability of this location is reflected in the fact that inhabitants were willing to purchase these water lots, which required filling, rather than move to available land further uptown. (figure 1A)

Although the Historic Structures Report states that "there seems

to be no record of the owners to whom these original lots (the water lots) were sold" (Prudon & Burditt 1979:4), we were able to locate the original water lot grants in the City of New York Topographic Bureau. Six water lots were sold between what is now Broad Street and Coenties Slip. The grants are dated November 19, 1686 except for the easternmost lot. The latter grant is dated December 18, 1686. As reflected in the surveyors' orders referenced above, each lot was eighty feet in length. The easternmost lot, granted to the Governor, Thomas Dongan, and sold by him to Frederick Phillipse in 1688 was forty five feet wide and was bounded "on the west by the lott of Peter Jansen Messier, on the north by the Streete (and) on the east by the vacant ground and wharfe before the City Hall" (Grants of Land Under Water Liber A:12-13). The land on which 64 Pearl Street now stands was granted, therefore, to the above mentioned Peter Jansen Messier (usually spelled Mesier). The grant for this 28½ foot wide lot gives the eastern boundary as the lot granted to Thomas Dongan, the western boundary as the lot granted to John Hedrix Bruyn, and the northern boundary (as was the case with all the grants) as "the Streete" (Grants of Land Under Water Liber A:15-17).

We assumed that the eastern boundary of the Dongan lot as given in the grant was coincident with the present western side of Coenties Slip. This assumption is supported by a modern map (Bromly 1961) which gives the present lot sizes. The lot on the southwest corner of Coenties Alley and Pearl Street has a Pearl Street frontage of 45' 11", eleven inches greater than the original water lot. The next three lots to the west have the same 28½ foot frontage. The two lots closest to Broad Street are 1 3/4 foot smaller and ½ foot greater, respectively, than the original water lot frontages. Since the 17th century and modern boundaries of these

six lots are practically the same, we can say with reasonable certainty that the original grantee of the 64 Pearl Street lot was Peter Jansen Mesier.

Each water lot grantee supposedly filled his own lot (Prudon & Burditt 1979; Kardas and Larrabee 1977:22). The water lot grants do not contain any specific requirements for the individual owners to fill the lots. However, subsequent water lot grants do have such requirements. In addition the Minutes of the Common Council (1905 vol. I:225) for June 14, 1691 record an order to the owners of the water lots to fill up "all Vacant holes and Spaces."

The first structure recorded on the block was built by Frederick Phillipse, probably on the lot at the corner of Pearl Street and Coenties Slip, which he acquired from Governor Dongan. An entry in the Minutes of the Common Council dated August 4, 1688 (1905 vol. I:200) orders him to build his house "Square upon the Wharfe . . . the Said house is to be built, twenty ffive foote broad: rounding twenty ffive foote to the Old Dock."

We have no firm evidence about the transfer of title to the lot on which 64 Pearl Street now stands immediately subsequent to Mesier's purchase of the water lot. However, we do know that by 1700, the lot had been purchased by Frederick Phillipse, who also owned the adjacent lot to the east, and that a house stood on the lot by this date. Frederick Phillipse's will, dated October 26, 1700, left the 64 Pearl Street property and the house standing on it to his son Adolphus Phillipse (Pelletreau 1892:369-374). The sketch by P.E. du Simitiere of about 1769 shows what is probably this building next to the original house built in 1689 by Frederick Phillipse on the corner lot (see illustration 11, Coenties Slip Historic Structure Report). Therefore, the first structure on the 64 Pearl Street lot was probably constructed between 1689 and 1700.

Before continuing with the history of the 64 Pearl Street lot it is

important to discuss the extension of the water lots which took place in 1692. On November 26, 1691, the Common Council ordered that water lots be sold which would extend the eighty foot lots previously sold an additional 25 feet into the dock (Minutes of the Common Council 1905 vol.I:256). The owners of the existing lots were to have rights of first refusal on these 25 foot extensions. The width of the extension lots as given in the grants indicates that the water lot extending the one originally purchased by Peter Mesier was bought by Jacobus (van) Cortlandt (Grants of Land Under Water, Liber A). This suggests the possibility that Cortlandt had bought the Mesier property prior to the sale of the extension lots, although it is possible that Mesier still owned the northern property and declined to exercise his right of purchase. The former interpretation is strengthened, however, by the fact that in October 1691, prior to the sale of the 25 foot extension lots, a report to the Council noted that "Mr. Cortlandt" was among those having failed to complete his wharf fronting "½ Lott" (Minutes of the Common Council (1905 vol. I:251). Since Cortlandt (not to be confused with Stevanus van Cortlandt, an original water lot purchaser) was not among the original water lot grantees, it is likely that he had purchased the original water lot from Mesier prior to its acquisition by Phillipse. A transfer of land between Jacobus (van) Cortlandt and Phillipse would not be surprising in view of the fact that the former was Phillipse's son-in-law (Pelletreau 1894 vol. I:369-374).

Sometime subsequent to the entering of Frederick Phillipse's will for probate in 1702, and prior to 1740, his son, Adolphus, must have transferred the property to his brother-in-law Jacobus van Cortlandt, because the latter's will transfers the present Lot 25 (64 Pearl Street - 34 Water Street) to his daughter Mary, married to Peter Jay (Pelletreau 1894 vol. III:307-310). If

our assumption that Mesier sold the land to van Cortlandt is correct and if Pelletreau correctly identified the property left by Frederick Phillipse to his son Adolphus as 64 Pearl Street, then it seems that the property was transferred from the van Cortlandt family to the Phillipse family and back again.

Three other transfers of the building and its site took place before the present building was constructed. In 1789 the Jay heirs sold the property to Bernardas Swartwout (N.Y.C. Land Records, Liber 46:105) who sold it only two months later to Leomontis Noe (N.Y.C. Land Records, Liber 45:552). Finally in 1856 the Noe heirs sold the property to Harry Seymour and Malvin C. Burrell (N.Y.C. Land Records, Liber 714:377-386).

A second building may have replaced the 17th century structure erected by Frederick Phillipse prior to the 1858 construction of the present building. The building shown in the du Simitiere sketch was probably also demolished in the late 1820's or early 1830's and replaced by a brick structure. Tax-assessment records for the property show an escalation in value ($3,000 between 1829 and 1830) similar to that assessed on other properties in the block when new buildings were erected. Contemporary descriptions of the area further confirm that by the 1830's virtually all of the 'Dutch style' buildings had been demolished" (Prudon & Burditt 1979:20, based on Disturnell 1837:12). The 1858 building was probably considerably larger than the previous structure on this lot because the tax assessment figures went from $15,500 ($8,000 for 64 Pearl Street and $7,500 for 34 Water Street) to $28,000 (New York City Assessment Records).

No known major structural changes relevant to our archaeological findings were made subsequent to construction. Many transfers of ownership and some changes in the use of the building occurred in the years subsequent

a depth of 63 inches below the surface of the basement floor. This test yielded eleven inches of medium brown sand and black sandy silt and five additional inches of black and brown mottled sandy silt. The black and mottled soil yielded faunal material, including mammal and fish bone, fish scales and oyster and mussel shell fragments, as well as small pieces of wood, mortar and plaster fragments. Fourteen small pieces of leather and a nail fragment were also recovered. Between 43 and 56 inches another layer of sterile, reddish brown sandy soil was encountered. At 56 inches, a stratum of silty clay containing wood and shell fragments was encountered and at a depth of 63 inches what appeared to be a large beam prevented further excavation with the post hole auger.

A third auger test was placed toward the rear of the lighted area, approximately 70 feet from the front of the basement. This test encountered dark brown sand to a depth of 38 inches beneath the basement floor. At this depth a layer of black silty soil was encountered and tested to a depth of 48½ inches. It was not possible to test beyond this depth because the post hole auger was blocked by a dense deposit of large oyster shells. This test produced a greater yield of artifacts and faunal material than auger test #2. Most of the material came from the black silty soil below 38 inches. Artifacts included bottle glass, a wrought nail, pipe stems, a ceramic fragment and a marble. Yellow brick, red brick, mortar, and wood fragments were also present. The deposit also contained fish and bird bone, fish scale, oyster shell fragments and whole valves, and a few clam shell fragments.

The results of the preliminary auger testing suggested that the fill deposits may have been stratified and that at least one stratum contained substantial concentrations of organic material and artifacts. Also, there appeared to be variability in the density of material in the areas tested.

to its construction. However, the listed occupants were mainly merchants with the exception of a hotel which remained in business for only a year (N.Y.C. Directories and Assessment Records).

II

FIELD METHODS

Prior to the conduct of the test excavations in the basement of 64 Pearl Street, we decided to place a number of auger holes in order to obtain preliminary information as to the nature, depth and variability of archaeological deposits. In general we concentrated on the east side of the basement since the area of greatest planned disturbance in the basement of 1 Coenties Alley would occur closest to that part of the 64 Pearl Street basement.

The auger holes were made with a variety of tools. A jackhammer was used to break up the thick basement floor. As discussed below, this proved to be a difficult task. Once the brick and concrete was removed, a two person, six inch diameter gasoline motor driven power auger was used to extend the tests another foot or so until the auger's maximum depth was reached. A four inch diameter, hand driven post hole auger was used to further extend the depth of the test holes.

Auger test #1 was placed 4½ feet west of the east wall and approximately 7 feet from the front of the basement. After penetrating only some five inches below the basement floor, this test encountered large rocks which prevented further excavation. Therefore, we placed auger test #2 further from the east wall and closer to the front of the basement at the northern edge of the lighted area. We were able to test at this location to

Therefore, we decided to place test excavations near the locations of auger tests #1 and #3 in order to more accurately and extensively test the fill deposits at these locations. Test cut (TC) A (figure 2) was located to the southwest of auger test #2. This test measured 4 by 4 feet at the surface of the basement floor, although, as indicated by the profile drawings, the actual size of the excavation below the floor was slightly smaller than this. TC C was located at the same location as auger test #3. The auger test was enlarged to make the test cut, which measured 3 by 3 feet. The auger test was thus present in the south portion of the test cut. All debris which filled the auger test as the floor was broken up for the test cut was carefully removed and discarded as each stratum was excavated.

We suspected that the rocks which prevented us from conducting auger test #1 may have been part of an architectural feature. Therefore, TC B was placed at the auger test location in order to expose any such feature. TC B measured 5 feet by 3 feet at the surface of the basement floor, with the long dimension running north to south. However, below a depty of 38 inches the dimensions of the test were reduced by about a foot in the north-south direction and about 6 inches east-west in order to support several large rocks which were protuding into the square.

TC B^1 is an extension of TC B. The southernmost 2 feet of the latter excavation were extended 3 feet to intersect the east wall of the basement. This extension was made to expose the foundation of the present structure and to detect any possible underlying architecture.

Each test cut was excavated by "natural" strata. Where a stratum was more than 4 inches in thickness each 4 inch level within the stratum was excavated separately. All of the soil (with one exception) removed from

each level was screened through ¼ inch mesh. Because the time allotted for excavation was approaching an end, only 50% of the soil removed from one of the levels in TC C was screened. All artifacts, vegetal and faunal materials recovered were bagged separately for each level.

The upper "strata" of each test actually consisted of the basement floor of the building, which is discussed in the following chapter. This floor was broken up using a jackhammer, and the loose brick, mortar and other materials shoveled out of the square. Samples of these materials were taken, however, and are available for analysis. All other soil was shoveled out of the test cuts and screened. Large concentrations of mortar and brick from below the floor, and coral from TC B, were weighed, sampled and discarded in the field. All of the bagged artifacts and vegetal and faunal materials were removed from the site to the laboratory. Appendices to this report present in tabular form the results of the analyses of these materials.

Upon the completion of excavation, profiles were drawn of all four walls of each test cut. Small soil samples were taken from the various strata of each test cut. Additional, larger samples were taken for flotation from those strata which yielded substantial amounts of organic material.

Several unique problems not usually faced by archaeologists were encountered in the conduct of this project. The East River occupied the locus of the tests in the 17th century. The present surface of the basement floor is now approximately 5 feet below the surface of Pearl Street. The bottom of our test cuts was thus some 11 feet below Pearl Street and near the present water table. Fortunately, until the end of the excavations water was only a minor problem. The water which seeped slowly into the test cut was periodically removed by using a small electric pump. Pumping was facili-

tated by first excavating a corner of the test cut to a given excavation level. This corner then acted as a "sump" into which the pump was lowered. Pumped water was discharged by hose onto Water Street. Shortly before the end of the project, however, drainage following a very heavy rainstorm resulted in a rapid accumulation of water in the test cuts, with a foot to a foot and a half of water accumulating in an unpumped square, necessitating more frequent pumping. Fortunately, most of the excavation work was completed when this occurred.

Another problem was created by the need to "water screen" some of the soil removed from the test cuts because the damp organic soil tended to adhere to materials in the soil matrix, making the identification of artifacts and floral and faunal remains difficult. After loose soil passed through the screen in the usual manner and large items were removed, the remaining material was washed to remove the adhering soil. In addition, each test cut contained a stratum of silty clay, as discussed in the following chapter. Artifacts and other materials were embedded in this clay, which would not pass through the screen. A strong jet of water was used to "blast" the clay through the screen, leaving the artifacts, stones and other material.

In order to accomplish this water screening, a hose was run into the basement from a hydrant on the corner of Water Street and Coenties Alley. A 50-gallon steel drum was placed at some distance from the test cuts so that spilled water would not drain into the excavations. Soil was wet screened over the drum, with an electric pump in the drum pumping the water out to Water Street and into the New York City storm sewer system. Both water and soil were washed through the screen into the drum and dirt accumulated at the bottom of the drum. We found that ele-

vating the pump a foot or so above the bottom of the drum with cinder blocks avoided clogging the pump, and the soil which accumulated on the bottom of the drum was periodically dumped out. This below ground level water screening system worked quite well although rain gear was needed by those doing the screening.

The other difficulty involved in this project was due to the fact that the excavation took place in March. The combination of chilly temperatures and water screening created considerable discomfort for the excavation crew. This was alleviated to some extent by using a large kerosene heater. Although there was ventilation in the basement, the heater had to be used sparingly to avoid a build-up of noxious fumes in the confined space.

III

TEST EXCAVATIONS - STRATIGRAPHY

Test Cut A (figure 3)

The topmost 24-25 inches of all of the test cuts consisted of the basement floor of 64 Pearl Street. Its construction is the same at all of the locations tested and will be described here. The topmost 11-12 inches of the basement floor consist of three courses of brick laid in mortar. Sample bricks measured 2½" x 3½" x 8". Mortar underlies the third course of brick and immediately below is a layer of asphalt or tar, ¼ to ½ inch thick, followed by a layer of slate, 1/8 to ¼ inch thick. Beneath the slate, a thick layer of concrete extends about a foot to a depth of 24-25 inches.

It is probable that the thick concrete layer topped with slate repre-

sents the original basement floor of the present mid-19th century building. The thickness of the concrete may be related to the depth of the basement and its consequent dampness and possible water seepage. The layer of tar and three brick courses were probably added at a later date and most likely represent an additional effort to deal with the problems of dampness and seepage.

Immediately beneath the concrete, a thin layer of light brown sand containing a large quantity of brick, wood, mortar and other rubble was excavated. This could represent the remains of an earlier floor or rubble from the demolition of an earlier structure on this location. The presence of machine cut nails and the absence of wire nails in this rubble indicates an early nineteenth century deposition. Another layer of mottled light and darker brown sandy silt underlay this lighter soil. Dateable artifacts include early 19th century types, such as a whiteware sherd, and a sherd of earlier delftware.

Beneath the early 19th century debris, the earlier fill was encountered. All of the dateable artifacts associated with this material are consistent with a late 17th century deposition. A layer of brown sandy silt began at a depth of approximately 26 to 30 inches and extended to a depth which sloped downward from approximately 38-46 inches in the north part of the square to approximately 53-56 inches in the south. This material contained few artifacts and comparatively little architectural debris (e.g. brick, mortar, stone), faunal or vegetal material. At the base of this stratum we encountered what appeared to be a layer of black silty sand with dark brown mottling which began in the northeast corner of the test cut and sloped downward to the south. This stratum contained a considerable amount of organic material and artifacts. Upon examination of the test cut profiles we realized that the

soil below the semi-sterile medium brown silt did not represent a single mottled stratum. Rather, there were several lenses and pockets consisting of essentially three types of soil. A lens of dark brown-black silt was present in the north wall of the test and it may have been this soil which yielded the dark organic material sampled by auger test #2. In the north wall of the test cut, the brown-black soil was overlain by a mottled layer and underlain by a lens of medium brown sandy silt similar to the uppermost layer of fill. The lenses of dark brown-black and medium brown soil only extended 1 - 1½ feet south of the north wall and the remainder of the test cut consisted of the mottled soil. That these distinctions were not noted as we excavated was probably due, at least in part, to the relatively poor artificial lighting under which the excavations were conducted.

The deposits of fill ended at a depth of 56-61 inches. At this point, a deposit of gray silty clay was encountered, sloping downward slightly toward the south. This stratum undoubtedly represents the 17th century bottom of the East River. The clay contained fewer artifacts than the overlying fill, but relatively more shell, brick, and wood including a number of large boards, planks, rocks and large pieces of brick. A large plank ran diagonally across the southwest corner of the test cut at a depth of 63 inches, slightly below the top of the clay. We drew a plan view of this debris before removing it, but no patterning was noted. The clay in TC A was 5-8 inches thick.

Because this was the first of the test excavations to reach the base of the clay, we continued the excavation another 11-16 inches. The soil consisted of various lenses and pockets of gray, brown and gray-brown mottled soil varying in texture from clayey silt to silty sand. Only one artifact and some debris and faunal material was recovered from the top

of this soil with the final levels yielding only a few shell and brick fragments. From the bottom of the test cut at 79 inches, we used a post hole auger to probe an additionaly 30½ inches. The soils encountered were sterile and appeared to be similar to those encountered in the final excavated levels. The material below the clay seems to represent various strata of the original river bottom.

Test Cut B (figure 4,5)

Beneath the basement floor, we excavated a thin layer of light brown silty sand containing mortar and rubble. This layer did not show clearly in the profiles, however, and could be interpreted as a mixture of crumbling concrete from the base of the concrete layer combined with brick chips from the breaking up of the basement floor. However, two nail fragments were excavated with this layer, along with the mortar, wood and brick and shell fragments. This indicates that the deposition of this material probably occurred before the pouring of the concrete floor, possibly in connection with the hypothesized 1829-30 building noted in Chapter I. Beneath the light brown sandy soil a thin, 1 inch layer of dark brown sandy silt overlay a layer of rocks encountered at a depth of 26-29 inches. The dark brown soil above the rocks contained six diagnostic ceramic sherds which date the deposition of this soil to the early 19th century. Thus it is not part of the 17th century fill. It should be noted that the top of the rock layer is at approximately the same depth as the top of the fill deposits excavated in TC A and C.

We excavated two courses of dry laid stones with a third course present in most of the test cut. It was these stones which prevented the completion of the auger test at this location.

Each stone course was excavated separately and the soil which lay between and beneath the stones was screened separately for each course. The soil matrix among the stones was similar in color and texture to the soil immediately overlying the stones. Some lighter colored soil was also present beneath some of the stones. Artifacts present in the soil matrix surrounding the stones suggest the probability that their deposition predates the 19th century construction episodes represented by the current basement floor and the underlying rubble layer. Diagnostic artifacts include three delftware sherds and a wrought nail. In addition, a white shell tubular "wampum" bead was found beneath one of the stones in the first course. This may indicate an early, probably 17th century, deposition of these stones. The base of the stone courses occurred at a depth of 32-36 inches. It should be noted that in TC A, a mottled layer occurred immediately beneath the light sand at 26-32 inches. In TC C a lens of dark brown sandy silt was encountered immediately below the light brown sand at 26-28 inches. It is possible that rather than being a part of the fill, these soils may have been deposited during the same later event which led to the deposition of the stones and the surrounding dark soil in TC B.

It does not appear likely that the stones were deposited as part of the filling process. They appeared to be deliberately laid, rather than being piled up haphazardly. The stones in the second and third courses appeared to be, in general, larger than those in the first course. The possible function of these stones could have been as part of a walkway, yard, basement floor or wall of an earlier structure. The latter appears unlikely, however, because maximum thickness of the three stone courses was only some 10 inches and the presence of smaller stones in the top course indicates that this is not the base of a higher wall.

Although the elevation of the original East River shore line remains uncertain, it is likely that the original surface of the 17th century fill was at a higher elevation than that at which it was encountered in the basement of 64 Pearl Street. It is likely that later construction episodes removed the top of the fill. An early stone walkway or other exterior area would have been laid on top of the original fill and thus subsequently removed. The most likely explanation is that the stones are part of the basement floor of an early structure at this location.

During excavation we removed those stones which were not deeply imbedded in the wall of the test cut. One large stone in the south wall and several in the north wall of TC B did not appear to be removable. These remained projecting into the test. We did not undercut these stones in the interest of safety. As noted in the previous chapter, this somewhat reduced the site of the excavated area. After the loose stones were removed, additional stones were noted in the south and north walls of the test cut. However, there were only a few stones present in the east wall and none in the west wall. The excavation of TC B[1] confirmed that TC B practically coincided with the eastern boundary of the stones. However, as discussed below, there are indications that stones to the east were removed when the currently standing structure was erected in the mid-19th century. To further determine the extent of the feature, we probed into the walls of the test cut with a 12 inch long surveyors pin subsequent to excavation. Probing in the south wall between the visible rocks indicated that additional stones were present at a depth of 3-4 inches. Probing in the east wall of TC B indicated that the feature did not, in fact, extend any further to the east. Probing in the west wall indicated that additional stones were present in the southernmost 26 inches of the west wall only. No stones were detected north of this.

This would tend to weaken the interpretation of the stones as an early basement floor, unless 19th century construction at this site resulted in removal of stones to the west as well as to the east of the test cut location. The recovery of a 19th century wire nail from the area in the west wall from which the stones were missing (discussed further in Chapter IV) indicates that such disturbance did, in fact, occur.

Beneath the stones, we encountered the fill deposits present in the other tests. To a depth of 45-53 inches, the fill consisted of dark brown sandy silt. In most of the test cut this was mottled with a dark black, clayey soil, but lenses of unmottled soil were also present. This material was excavated as stratum IV. A lens of heavily mottled brown sandy silt in the south part of the square was excavated separately as stratum V. Beneath this, a 2-8 inch thick layer of darker, grayish-black silty sand was encountered. The gray clay stratum began at a depth of 54½-60 inches in TC B. The deposit was 10-16 inches thick in this test cut, thicker than in TC A but not as thick as in TC C. As in TC A, the gray clay contained larger pieces of debris than the overlying fill. In addition to rocks and bricks, the TC B clay stratum yielded 10 large pieces of coral, weighing 93½ pounds, in addition to smaller fragments. There was only one board present in TC B unlike the clay stratum in TC A. The clay deposit in TC B differed from that in the other tests in that it yielded a substantial number of artifacts as well as architectural debris, shell, and vegetal and faunal material.

We excavated the southwest corner of the test cut an additional 5-6 inches in order to sample the gray-brown silty sand which underlay the clay. This soil yielded some brick and mortar and tile fragments and a pipe stem as well as shell fragments and soft shell clam valves.

Test Cut B^1 (figure 5,6)

TC B^1 was an extension of TC B eastward abutting the foundation of the present structure. Its primary purpose was to acquire information about the sequence of construction at this location. The brick basement floor extends to the east wall of the building. Four additional brick courses, only one course wide, were laid in tar or asphalt against the wall above the level of the cellar floor. This is another indication that the brick addition to the floor was an attempt to seal the basement against dampness and seepage. The concrete underlying the brick was poured over the foundation stones which extended westward from the wall. The layer of brown sand with mortar underlying the concrete appeared to overlay the foundation stones indicating that this material was spread after the foundation was built. It contained one sherd of an early 19th century ceramic type.

Beneath the concrete and the sand/mortar layer, we encountered a brown and tan mottled soil with inclusions of clayey silt to a depth of 33-34 inches with a pocket of darker soil near the foundation. All of this soil represented the trench dug during the construction of the foundation. Several sherds of whiteware and soft paste porcelain indicate a deposition during the mid-19th century, consistent with the known date of construction of the present structure. The bottom of the stratum yielded some earlier material, two delftware sherds and a Dutch "belly bowl" pipe. This was probably part of the original fill which was excavated for the wall "trench" and redeposited after the construction of the foundation. To a depth of approximately 34 inches, therefore, all of the soil to a distance of 2½-3 feet west of the foundation wall was deposited during its construction. This construction involved removal of the stones which constituted the floor or walkway discussed above and any of the earlier fill which may have been adjacent to or

beneath these stones.

To this depth, the foundation consisted of layers of small building stones which are seated on very large foundation stones. A large foundation stone exposed by TC B^1 was nearly 2 feet in length. Earth settling left an empty space several inches in width beneath this stone. This space enabled us to measure the width of the stone at 38 inches. It thus ran beneath and supported the entire wall. It is possible that some of the stones used in constructing the foundation may have been those removed from the earlier feature exposed by TC B.

Below an approximate depth of 34 inches, the stratigraphy in the westernmost part of TC B^1 is a continuation of that in TC B. Brown sandy silt with darker mottling and lenses of brown sandy silt overlie a darker brown silt with the gray clay beneath the latter stratum.

In the eastern portion of the test, the wall trench continued downward. We excavated this trench separately, undercutting the wall slightly to determine the method of foundation construction. Below the large footing stones mentioned above, the trench had apparently been filled with mortar and brick fragments with brown sand present in some places immediately below the stones. About 3 inches below the large footing stone we encountered the top of a round wooden post 7 inches in diameter. On the south side of the post mortar with brick fragments was packed against the post to a depth of 44 inches. The south wall profile indicates that from 34 to 44 inches, the wall trench extended to a point only 16 inches from the wall, with the earlier fill strata continuing west of this point. A board was apparently placed flat against the side of the fill in the west wall of the trench to support the mortar. At 44 inches the dark brown silty sand stratum noted in TC B and the western part of TC B^1 continues beneath the wall trench.

North of the post, the trench was filled with mortar to a depth of 40 inches, with another sizeable rock present among the mortar. The placement of this rock to fill the excavated trench and anchor the mortar and the fact that the trench was several inches shallower on this side apparently eliminated the need to place a board against the side of the trench as noted on the other side of the post.

The dark soil containing mortar which comprised the wall trench fill was screened separately below the level of the footing stones to determine whether the post and the mortar supporting it may have been associated with earlier construction and reused for the existing building. This portion of the wall trench yielded two whiteware and ironstone sherds, indicating an early-mid-19th century deposition.

The brown and mottled brown sand was excavated to a depth of 44-45 inches. At this depth, just above the darker brown sand layer, we confined the excavation to the northernmost 1½ feet of the test cut in order to explore the nature of the wooden post by exposing one side of it. We proceeded in this manner in order to shorten the time needed for excavation and also to minimize any possible weakening of the building support which might have occurred if the entire post was exposed.

The clay stratum was encountered at a depth of approximately 48-53 inches, sloping downward from east to west. The stratum was excavated to a depth of 58-59 inches. A layer of mortar approximately 1-4 inches thick was present at the top of the clay stratum--in the northeast corner of the excavated area, running under the foundation and abutting the wooden post. Stratigraphic considerations indicate that this mortar is not part of the wall trench. Artifacts excavated from the sand and clay strata below the wall trench indicate that this material is part of the earlier fill and

the mortar at this depth was probably deposited with this fill.

At 51 inches, concentric bands of brown and light brown sand appeared to surround the post. A ½ inch band of light brown sand abutted the post and another 2½ inch band of brown sand surrounded this. At the base of the excavated level, however, the clay surrounded the post. A piece of coral in the clay was found to be flush against the side of the post. The stratigraphy and the presence of this coral indicates that the post was driven through the layers of fill and clay below the wall trench as a support for the foundation. Although no further excavation was carried out below 58 inches, a small area next to the post was dug out with a trowel to attempt to determine its maximum depth. This probing extended to a depth of 79 inches, which penetrated below the bottom of the clay stratum at approximately 64 inches and into the underlying brown sandy silt. Although the post continued below this depth, small pieces of wood were found at a depth of 77 inches. These may have broken off as the post was driven downward, suggesting that the base of the post may not be too far below this depth. Unfortunately, it was physically impossible to excavate deeper in the confined space available.

Test Cut C (figure 7)

Beneath the basement floor, we excavated a thin (1-3 inch) layer of light brown sandy soil with rubble, similar to that encountered in TC A. We discarded the rubble from this stratum and no dateable artifacts were recovered from it (one sherd of bellarmine stoneware encountered at the bottom of the stratum may have been associated with the underlying soil). This soil and rubble was probably deposited by the same event which led to the deposition of the rubble beneath the floor in the other test cuts. As

in TC A, TC C profiles revealed the presence of a number of lenses of dark, medium, and mottled dark-medium brown silt and sand. Lenses of dark brown and medium brown sandy silt were present in the south part of the square underneath the light brown rubble stratum. The dark brown soil was excavated with the mottled soil while the medium brown material was excavated separately. This latter soil contained a relatively small number of artifacts and little faunal and vegetal material. The brick and mortar may be associated with the overlying rubble layer. At depths beginning at 26-33 inches and ending at 48-56 inches the soil in TC C consisted of lenses of medium brown sandy silt and medium and dark brown mottled sandy silt. At the bottom of the fill, a 1-7 inch lens of dark brown sandy silt extended across most of the cut, except in the southwest corner. While we attempted to excavate the various soil types separately, the interbedded lenses and the poor lighting made this a difficult task and toward the bottom of the fill we decided to excavate in arbitrary 4 inch levels. All of this material contained substantial concentrations of artifacts, as well as floral and faunal material. Where we attempted to excavate the medium brown sand separately, this soil appeared to have a lower density of artifacts and other materials than the mottled and darker soil, although the shell concentration appeared to be comparable.

At a depth of 53-61 inches we encountered the gray clay stratum. It sloped downward toward the south and east in this test cut. The clay in TC C had a lower concentration of all materials than in the other tests. While some rocks and bricks were present, we encountered neither the large planks and rocks excavated in TC A nor the large quantity of coral in TC B. However, the clay stratum in this test cut was substantially thicker than the others. The entire test cut was excavated to a depth of 68-69 inches without reaching the base of the clay. Because of a lack of time only 50% of the last 7 inches

of this material was screened. Below this depth, we excavated only the northwest quadrant of the square in order to reach the bottom of the clay. In this portion of the square the clay ended at a depth of 76 inches. A log was present in the extreme northwest corner. Thus the clay in this test is approximately 25 inches thick. The presence of the log suggests that other large pieces of debris may be present at the bottom of the clay. Dark gray sandy silt was detected immediately under the clay in the excavated corner of the test.

Summary

The base of the stratigraphic sequence at the present location of 64 Pearl Street consists of the sands and silts which constituted the bottom of the East River in the 17th century. Above this, a layer of silty clay was formed by the river bottom sediments which existed close to the shoreline. The artifacts, flora and fauna recovered from these river bottom sediments could have been deposited by two processes. Some would have been deposited in the River either deliberately or accidently before the area was filled in the late 17th century; others could have been deposited with the fill and pressed by their own weight and that of the overlying fill into the river bottom sediments.

Overlying the river bottom sediments is the fill deposited in the latter part of the 17th century. This consists of several soil types, mainly a medium brown sandy silt, a dark brown sandy silt and a mottled soil representing a mixture of the two. To the extent that we were able to separate these soils during excavation, it appears that the medium brown soil is comparatively sterile. The stratigraphy indicates that these soils were not deposited in clear strata but, rather, that the fill consists of interbedded

lenses of the various soils. This suggests that all of this fill was deposited at the same time rather than representing separate filling episodes. It also suggests that various loads of fill were taken from different locations. It could be that the medium brown sand represents loads of sterile subsoil. The darker soils containing archaeological materials may have been taken from the surface, and thus included both naturally deposited materials such as twigs and nuts and trash deposited by human activities. Lenses containing especially heavy concentration of archaeological materials may represent soil taken from areas where trash was intentionally deposited.

TC B provided possible evidence, perhaps part of a basement floor, of a structure which existed on the site between the filling of the land and the 19th century. A thin stratum of dark and mottled soil in the other tests may represent the same period. It is possible that architectural debris immediately below the present basement floor is associated with a previous 19th century structure at this site. The foundation of the east wall of the 1850's structure which now stands at the site was definitely constructed during the 19th century. It was either laid when the existing building was constructed or represents the foundation of an earlier 19th century building which was reused for the present structure. Some slight evidence for the latter interpretation is provided by the fact that a thin layer of sand and mortar beneath the present floor appears to overlie the existing footing stones. This layer could, however, have been deposited during the construction of the present basement floor, after the construction of the foundation.

The original basement floor of the present structure apparently consisted of concrete covered by a layer of slate. Apparently a later construction episode involved the deposition of a layer of tar and three course of brick which completed the existing basement floor. This was probably added to seal

the basement against dampness and water seepage.

Documentary Evidence

As discussed in the introductory chapter, documentary research indicates that the original filling of the 64 Pearl Street lot extended only 80 feet from the existing shoreline. An additional 25 feet were filled subsequent to the letting of the extension water lot grants in 1692. Unlike the recipients of the original 80 foot grants, the later grantees were required to fill the lots by using "the Dock Mudd Twenty ffoot into the Dock." This was specified in the original order of the Common Council (1905 vol. I:259) and also in the grants themselves (Grants of Land Under Water, Liber A). Therefore, the land fill in the portion of the present 64 Pearl Street lot closest to Water Street should be different from that uncovered during our excavations. However, we did not test in this portion of the building. The southernmost excavation, TC C, was located approximately 70 feet south of the front of the building. We know that at the time of the filling of the original water lots the present location of Pearl Street was at least partially on dry land. The water lot grants themselves specify "the Streete" as the northern boundary of the lots, and various sources refer to open ground, usually referred to as the Strand or Water Side, in front of the structure built on the north side of what is now Pearl Street. We do not know what the width of this open space or street was. However, the width of the present Pearl Street in front of #64, including sidewalks, is only 34 feet. Thus it is highly unlikely that the location of TC C is further than 80 feet from the original shore line. Therefore the change in the character of the fill from the sand encountered in our tests to the clayey silt which represents the "Dock mud" would be encountered south of the area tested. It is possible that the fill in the latter area would be

difficult to distinguish from the original river bottom deposits since the fill would consist of these same deposits, perhaps mixed with some of the underlying sand.

IV

ARTIFACTS RECOVERED (Table 1)

Smoking Pipes

A total of 262 smoking pipe fragments were recovered from the test excavations. These included 123 pipe stem fragments with measurable bore diameters. Harrington (1954) noted that during the 17th and 18th centuries, pipe stem bore diameters became increasingly smaller, with particular diameters being most common during particular time periods. Although the collection of measurable stems from the 64 Pearl Street excavations is relatively small, it is sufficiently large to give a fairly accurate idea of the manufacturing dates of the pipes. All but ten of the stems (91.8%) were either #6 or #7 stems (i.e. 6/64 or 7/64 inch bore). According to Harrington's data, #6 stems date between 1650 and 1750, with their greatest popularity falling between 1680 and 1710. 61.8% of the measurable pipe stems from 64 Pearl Street were #6. #7 stems (30.1% of the collection) date from 1620 to 1710, with the greatest popularity falling between 1650 and 1680. Nine #8 pipe stems were recovered. These date between 1620 and 1680. One #9 stem, dating to 1620-1650, was recovered. Since clay pipes are fragile, it is reasonable to assume that in general there was a short time (a few years at most) between the date of manufacture of a pipe and its deposition in primary archaeological context. However, it must be kept in mind that with the possible exception of stems recovered from the river bottom deposits (19 measurable stems), these artifacts

represent refuse redeposited in the fill. According to Harrington's data, it is extremely unlikely that deposition took place before the 1650's, when #6 stems first make their appearance, and it is unlikely that the fill could have been deposited after about 1710, when a large number of #5 pipe stems would be expected. These were absent from the excavated material.

Binford (1962) devised a method, based on Harrington's data, for rapidly calculating a mean date for a collection of pipe stems. Applying this method to our data, we arrived at a date of 1684.25 years, which indicates that the filling probably did not occur prior to the 1680's. The filling could have occurred at any time after this, although not much after 1710. The complete absence of #5 stems which began to appear as early as 1680 indicates, furthermore, that the filling most likely did not occur too long after the 1684 mean date of primary deposition. The documentary evidence indicates that the land on which 64 Pearl Street now stands was probably filled by 1692. Pipe stem dating thus tends to support the documentary evidence.

Decorated Pipe Stems and Bowl Fragments

A number of the pipe stem and bowl fragments recovered from the excavations had decorations or other features worthy of note. Two pipe stems have maker's marks which enable their dates of manufacture to be rather closely determined.

A. HG mark - Catalog #14.8 (Photograph 1)

This fragment was recovered from the TC A fill deposits (stratum IVb), It contains a maker's mark "HG" impressed on the heel of the pipe. A trace of a crown is visible above the initials. According to McCashion (1979), this was the mark of Hendrick Gerdes, an Amsterdan pipe maker. McCashion

dates HG pipes to 1670-1684, Gerdes having died on February 29 of the latter year. McCashion illustrates a pipe with an HG heel mark which has a crown above the initials (1979:130, plate 39).

B. (L)?E mark - Catalog #50.41

This stem fragment was recovered from the fill deposits in TC C (stratum IIId). It has a maker's mark "?E" with a double zig zag design circling the stem on either side of the mark. Unfortunately, the first initial of this mark has been obliterated on the specimen. This mark could be either of two illustrated by Alexander (1979:46, 48). Both have a similar zig zag design surrounding the initials. The WE mark is attributed to two pipemakers working in Bristol, England. William Evans (I) ended his apprenticeship in 1660 and William Evans (II) in 1667. Both were working in 1682 and one may have been active as late as 1697. Both were known to have exported their pipes. The LE mark is attributed to Llewelyn Evans, who ended his apprenticeship in 1661 and died in 1658 or 1689. He was probably the brother of William Evans (I) and is also known to have exported his wares. This specimen could have been deposited in primary archaeological context between the 1660's and 1680's. Because of the small size of the obliterated area we believe that the missing initial is more likely to have been an L rather than the wider W.

A number of other recovered fragments contain elements that, while not precisely dateable provide general information about the origin and date of the pipes.

A. Fleur-De-Lis Motif

Two examples of pipe stems with fleur-de-leis motifs were discovered:

Catalog #56 - This specimen from the gray clay stratum (VIIc) in TC B has the fleur-de-lis design arranged in what McCashion (1979) calls the "four on diamond" pattern.

Catalog #47.28 - This stem fragment from the fill deposits in TC C , (Stratum IIIc) has the fleur-de-lis design arranged in a linear pattern.

Both McCashion (1979) and A. Noel Hume (1979) note that the fleur-de-lis stem mark was most popular in the mid-17th century.

B. Runs-of-Dots and Rouletted Designs

Four pipe stems contain a design which McCashion (1979) terms the "runs of dots" design which is combined in various ways with rows of rouletting. The provenience of these stems is:

Catalog #45.7 - TC B, Stratum VIIIa (grey clay)

Catalog #46.36 - TC C, Stratum IIIb (fill)

Catalog #54.11- TC C, Stratum IIIf (fill)

Catalog #28.2 - TC B[1], Stratum IIb, Feature I (builders trench for present structure, probably redeposited from earlier fill during filling of trench).

McCashion (1979) calls this design a "typical Dutch pipe maker's stem mark and notes that it occurs on 17th and 18th century American sites.

An additional pipe stem fragment, from Catalog #43.13, I (TC C, Stratum IIIa, fill) is decorated with rows of rouletting, but no runs of dots are present.

C. "Alligator" Design

This design appears on a pipe stem from Catalog #53, TC C, Stratum IIIf (fill). This pattern appears on the stem of pipes which have "Walter Raleigh" heads on the bowl, and are dated to the 17th century. (photograph 1)

D. Rose Mark

This mark appears on the heel of a pipe fragment (Catalog #12.1, TC A, Stratum IVb, fill). While somewhat worn, this appears to be the "rose mark"

attributed to 17th century Dutch pipes by McCashion (1979). McCashion's plate 23 (1979:104) illustrates an example of this design which has a center dot surrounded by five dots representing flowers and five diamond shapes between these dots representing leaves. The bowl part of this fragment has the "belly bowl" shape characteristic of Dutch pipes. (photo. 2)

E. "Milk Maid"

The heel of this fragment from Catalog #43, TC C, Stratum IIIa (fill) has a design which is largely obliterated. It is possibly the "milk maid" design found on 17th century Dutch pipes.

F. "Belly Bowl" With Dots on Heel

The bowl portion of this fragment from Catalog #29.2, TC B^1, Stratum IIIa (wall trench) has the characteristic Dutch "belly bowl shape. The specimen has a raised dot on the right side at the junction of the heel and body of the pipe. A second dot may also be present near the base of the heel portion. McCashion (1979:120, plate 31) illustrates a pipe with a raised dot on the left side, although he notes that such dots are usually found on the right side of the pipe. McCashion notes that this dot is unique to seventeenth century Dutch pipes. He speculates that it may be a mark used to differentiate pipes of different quality. He does not note any pipes with two dots, however.

G. Belly Bowl Shape with Spur Heel (Photograph 2)

This specimen from Catalog #64.1, TC C, Stratum VIc (gray clay) represents the major part of a pipe with only the stem missing. In common with #12.1 and #29.2 discussed above, the bowl of this specimen has the "belly bowl" shape characteristic of Dutch pipes. Unlike the other specimens, this pipe has a more pronounced heel. The series of pipes illustrated by I. Noel Hume (1970:303, fig. 97) shows a spur-like heel on pipes manufactured between 1690

and 1750. However, these pipes are of English manufacture, and the specimen illustrated by Hume does not have the belly bowl shape.

H. Elbow Pipes (Photograph 2)

These specimens, Catalog #16.13, TC A, Stratum Va (gray clay) and Catalog #54.7, TC C, Stratum IIIf (fill), are apparently from 17th century Dutch elbow pipes. #16.3 has enough of the stem present to show that the "elbow" portion is sharp, which is supposedly a characteristic of pipes manufactured in the third quarter of the century in contrast to the more rounded elbow manufactured later in the century. #54.7 has little of the stem present, but this specimen also appears to have a sharp elbow.

Summary

The specimens discussed above, together with dating based on bore diameters, appear to support a deposition date for the fill during the late 1680's or early 1690's. There is an absence of types dating later than the 17th century.

According to McCashion (1979:69) most pipes imported into New York State between approximately 1630 and 1690 were of Dutch manufacture. Only a few English pipes were present during this period. About 1690 the import of English pipes increased and these replaced the Dutch pipes shortly after 1700. Only one of our specimens (the L or W Evans pipe) is clearly of English manufacture. If the fill was deposited after 1690, we would have probably found more English pipes.

Ceramics

A total of 336 ceramic sherds were recovered from the test excavations. As discussed below, most of these are dateable only within a broad range. Those

which can be more closely dated will be discussed in greater detail. In general, the ceramics recovered from the fill and river bottom deposits are types which had broad popularity during the seventeenth century. Table 2 shows the distribution of the various ceramic types discussed below.

A. Delftware

Ninety-five delftware sherds (28% of all ceramics) were recovered. These have a generally buff-colored paste and a tin glaze. Delftware was made in both Holland and England during the 17th century and for the most part the origin of the small sherds recovered from the excavations cannot be determined.

Delftware was produced throughout the 17th and 18th centuries (Noel Hume 1970: ; South 1972) and most of the white and blue-on-white decorated sherds cannot be dated more closely.

Two of the blue-on-white decorated sherds (Catalog #50.5 and #54.24) may be from a vessel decorated with a Wan-Li type design. The "Wan-Li" pattern was popular in the early part of the 17th century. However, Noel Hume (1970) points out that pseudo-Chinese motifs were also popular during the latter part of the 17th century. The actual design cannot be determined from the two small sherds recovered from the excavation. An additional sherd which can more definitely be identified as having a Wan-Li design was recovered from a flotation sample taken from the TC A fill. This sherd is from a charger, a decorative plate with holes through the rim which enabled the plate to be hung on a wall. An additional sherd of blue-on-white delft which could not be identified further was recovered from another flotation sample taken from the TC C fill.

One blue-on-white sherd (Catalog #45.9) is probably from an apothecary jar of the type popular during the 17th century. South (1972) gives the

date range for monochrome decorated apothecary jars as 1620-1775. However, the presence of what appears to be a chain pattern in what would have been the middle of the jar represented by this fragment indicates that it dates to the earlier part of this range. (Photograph 3)

Eleven of the delftware sherds are of a light or "Robin's egg" blue color, some having a darker blue decoration on the light blue background. This light blue delftware was manufactured between approximately 1690 and 1780 (Paul Huey, personal communication). This is not inconsistent with the date of filling the late 1680's or early 1690's suggested by the documentary evidence and the other excavated artifacts.

Seven Majolica sherds were included among the delftware sherds for purposes of tabulation. These have a tin glaze on one side but have a clear lead glaze on the other. Majolica was made in both Holland and England between approximately 1550 and 1660 (Charlotte Wilcoxen, personal communication). After this date delftware which was tin glazed on both sides became more popular. The relatively small number of earlier Majolica sherds together with the relatively small number of light blue delft sherds supports a late 17th century date of deposition for the fill deposits.

Three sherds from Catalog #53 have a deep blue tin glaze on both sides with a design of white "clouds" over the blue glaze. This ceramic type is known as Nevers bleu persan. It was manufactured in Holland, France, and England. Archer and Morgan (1977:22-23, plates 22 and 23) illustrate two vessels of this type which are dated to 1680-1700. (Photograph 3)

Six sherds of delftware tile were recovered, of which three were plain white and three had blue decoration. These tiles were probably used for fireplaces and wall skirtings, as opposed to the thicker tiles used for flooring. After the 16th century, such delft tiles were manufactured in England as well

as Holland (Hume 1970:285). One large sherd shows a design which includes houses (Catalog #45.12), one with a Dutch type sloping roof and what appears to be the end of a windmill blade (Photograph 3). Water appears to be flowing in the foreground indicating that this may be a harbor scene. According to Hume (1970:292-293), tiles of the last quarter of the seventeenth century tended to have designs which filled up the center of the tile whereas the earlier tiles had larger plain white areas. Designs of the latter part of the seventeenth century included depictions of "ships, harbors ... and landscapes." This suggests that this tile fragment probably dates to the last quarter of the seventeenth century. It is interesting to note, however, that an apothecary jar illustrated by DeJonge (1969:19) shows what appears to be a bridge supported by two towers with water flowing underneath (DeJonge terms this structure "city gates"). A tall structure on our tile specimen may represent a similar "bridge tower," and other elements of the two designs appear to be similar. The apothecary jar illustrated by DeJonge is dated to 1600-1625.

A second delftware tile fragment (Catalog #62.3) is from the corner of a tile and contains a portion of the design which usually appeared in tile corners. This appears to be a part of what Hume (1970:290-293, figure 94, #12) refers to as the "Bug" or "Spider's-head" design. Hume dates this design to the second half of the 17th and into the 18th century.

The delftware sherd numbered 56.21 is of an unusual type. The design is composed of both a light blue and a darker, blue-black shade on a white background. While the nature of the design is uncertain, it is most likely some form of the chinoiserie designs which were popular during the last quarter of the 17th and into the 18th century. (Noel Hume: 1970:109). The back of this sherd is unusual. It is coated with a dark brown glossy tin

glaze. French faience of the 18th century was coated with a heavy lead glaze on the reverse side, but there are no recognized types known to us which have a brown tin glaze. The French faience of the latter part of the eighteenth century also tended to have simpler decorations than that present here. (Photograph 3)

B. Buff-pink Bodied, Lead Glazed Earthenwares

Eighty-eight of the sherds recovered from the excavations have been tabulated in a group which includes lead-glazed wares with bodies ranging from gray through buff to pink.

C. Green and Yellow Glaze

Nine sherds have a green glaze on the exterior and a yellow glaze on the interior. Seven additional sherds with a green glaze on one side and the glaze missing from the interior are assumed to be vessels of the same type. Ceramics with a buff paste, exterior green glaze, and a yellow glazed interior are considered to be of 17th century Dutch (or possibly English) manufacture. Three sherds (Catalog #45.10, 45.64, and 50.17) have a distinctive rim profile characteristic of 17th century Dutch (and English) ceramics. The two sherds from Catalog #45 crossmend. One sherd (Catalog #14.29) has a salmon pink body with a green glaze (the glaze is missing from the reverse side). This type of ceramic is considered to be of French rather than Dutch origin.

Eighteen sherds have a yellow glaze on both sides, and thirty-six sherds have a yellow glaze on one side only with the glaze missing from the reverse. These sherds are probably of seventeenth century manufacture. One interior glazed sherd (Catalog #50.2) is probably a part of the foot of a pipkin, a three footed vessel common during the 17th century. Nine sherds have a mustard colored glaze. These are considered to be of 17th century

Dutch manufacture. One of these sherds (#43.67) is probably from a colander.

D. Red Bodied Earthenwares

One hundred and fourteen red bodied earthenware sherds were recovered. Nineteen of these sherds had a ginger colored glaze with a silvery iridescence. One of these (#14.4) has the typical 17th century Dutch rim profile noted above. Ten of these sherds were from the same excavated level in the TC A fill deposits, and probably represent fragments of the same vessel. (Photograph 3)

Thirty-seven of the red earthenware sherds have a dark iron manganese glaze. Fifteen are glazed on both sides. The glaze on the other sherds is always on the interior of the vessel, in those cases in which it is possible to distinguish the insides and outside surfaces of the sherds. One sherd (#5.1) is probably from a colander. Two sherds (#43.2 and #46.1) cross-mend. One sherd (#50.38) has a shiny glaze somewhat darker than the others in this group.

Forty-one sherds have a clear lead glaze over a red body. Two sherds (#52.4 and #14.6) have the 17th century rim profile. One large sherd (#53.19), glazed on the exterior, is either a crock lid or the base of a large plate. A second sherd (#51.8) appears to be from the same vessel, although the two sherds do not cross-mend. Sherd #14.17 has an unglazed portion where a foot or handle has broken off. The glaze on two sherds in this group (#10.2 and #16.8) is slightly yellower than on the others.

Seventeen red earthenware sherds are unglazed. Four contain traces of slip (#14.2, #48.1, #50.15, and #43.60). One sherd from Catalog #54 is a possible piece of kiln furniture (ceramic used to support vessels in the kiln during firing).

A cylindrical piece of what is probably burnt ceramic was recovered from TC A (#16.5--not included in ceramic tabulations). It measures 5/8 of

an inch in length and 5/16 in diameter at its base, tapering towards the top. This may also be a piece of kiln furniture. The presence of these objects suggests that some of the ceramics may have been manufactured locally.

E. Slipwares

Three slipware sherds were recovered. One sherd of buff bodied, combed slipware was recovered from TC A (#12.17). This type of ceramic was manufactured in both Staffordshire and Bristol, England (Noel Hume 1970:135). South (1972) gives the dates of manufacture of combed slipware as 1670-1795. However, Noel Hume (1970:135) notes that in general the early combed slipware had narrow and zigzagged stripes, while the later examples had straighter and wider stripes. The present example is of the former type, indicating its probable manufacture during the late 17th century.

A second slipware sherd, also from TC A (#14.18), has a red body with traces of a thick white pipeclay slip under a clear lead glaze. The sherd is too small to permit a firm identification to be made. However, it may be from an English "metropolitan" slipware vessel of the Wanfried type, manufactured c. 1580-1625. We would expect to find some sherds of these earlier ceramic types in fill deposits of the latter 17th century.

A third slipware sherd (#105) recovered from the stone basement floor in TC B has a salmon color body with a mustard colored glaze and white pipeclay slip. This is probably of 17th century Dutch manufacture.

F. Stoneware

Nineteen stoneware sherds were recovered. Nine of these are gray bodied stoneware with a mottled brown glaze. This type of glaze was typical of the Rhenish stoneware bellarmine type bottles manufactured between 1550 and 1700 (Noel Hume 1970: South 1972). However, English copies of Bellarmine bottles were manufactured beginning in the 1670's and continuing into the

eighteenth century (Noel Hume 1970:112, 144). Unfortunately, none of the sherds recovered from the present excavations have any of the decorative Bellarmine features which could enable a closer dating.

Three sherds of a gray bodied, cobalt blue decorated stoneware were recovered (#45.5, #56.10, #54.34). Cobalt blue, gray bodied Rhenish stoneware was produced beginning in the later part of the 16th century and continuing into the eighteenth century (Noel Hume 1970). Two of the sherds (#56.10 and #54.34) represent sprig molded portions of Westerwald vessels. This decorative technique was used between 1650 and 1725 (Hume 1970; South 1972). The former sherd contains a cobalt blue ornament and the latter, manganese purple ornamentation. The use of manganese purple for ornamentation of Westerwald vessels began in the 1660's, but did not become popular until the last quarter of the 17th century and did not survive long into the 18th century (Noel Hume 1970:281).

Seven gray and buff-gray salt-glazed sherds are non-diagnostic.

G. Whiteware-Ironstone

Sixteen whiteware sherds were recovered. None of these originated in the fill or river bottom deposits. All were probably deposited during 19th century construction activity. Some of the whteware sherds have a slightly harder paste and may be considered as "ironstone." These ceramic types were introduced in approximately 1820 and continue to be manufactured into the twentieth century.

Three of the whiteware sherds (#5.4, #23.1, and #24.2) are of a type known as shell edged decorated, with the decoration being molded and painted blue underglaze. Edge decorated pearlware was manufactured between 1780-1830 (South 1972) and the decorative technique continued to be used on whiteware until the Civil War.

One of the undecorated sherds (#24.3) may be a late example of pearlware, manufactured until about 1830.

Three other decorated whiteware/ironstone sherds were recovered. One (#24.1) has a pink transfer printed design. Pink and purple became popular decorative colors in the 1830's. Another sherd (#28.1) has a design consisting of a circle of six dots around a seventh central dot, all in green overglaze. The third decorated sherd (#5.5) has a purple sponge decorated design. This decorative technique came into use in the 1830's.

Other Artifacts

A. Marbles

Six ceramic (stoneware) marbles were recovered. Three of these (16.1, #16.2, and #16.6) come from the same stratum in the TC A river bottom clay deposits, and one (#56.19) was recovered from the river bottom clay deposits in TC B. A fifth clay marble (#48.2) was recovered from TC C fill deposits. The sixth marble was from auger test #3, adjacent to TC C. The marbles measure 1.4-1.6 cm. in diameter.

A larger, almost spherical, smooth, stone object (#64.4) measuring approximately 15/16 inches (2.4 cm.) in diameter was recovered from the river bottom clay deposits in TC C. While this may have been a deliberately fashioned marble, the fact that it is not perfectly spherical suggests that it may be a naturally occurring water-worn pebble.

B. Musket Ball (?) (Photograph 10)

An irregularly shaped piece of lead (#45.54), in the general form of a flattened hemisphere, with maximum dimensions of 1¼ x 1 x 5/16 inch, was recovered from the clay stratum in TC B. This object is most likely the remains of a musket ball which was flattened after having been fired.

An alternate identification as a drapery weight was suggested for this object, but its shape makes the former explanation more likely.

C. Buttons

Three metal and seven wooden buttons were recovered from the excavations, all from the TC C fill deposits.

Catalog #54.23. Unidentified metal (iron?) with a brass-plated surface approximately ½ inch in diameter. Its shape is that of a flattened hemisphere. The surface of the button has a "basket-weave" design. The back loop is missing and was probably soldered on. This is probably a military sleeve button. (Photograph 4, 5)

Catalog #54.33. This specimen is also of a flattened hemispherical shape and approximately ½ inch in diameter. The button itself is of an unidentified metal (possibly pewter) with a brass loop soldered to the back. The face is undecorated.

Catalog #43. This button is also of a flattened hemispherical shape and slightly less than ½ inch in diameter. It is made of an unidentified metal and the loop, originally soldered to the back, is missing. The face has a rosette design. Noel Hume (1970:89, fig. 22) illustrates a button with a similar design which dates to the late 17th century. (Photograph 4,5)

Wooden buttons - These buttons are discoidal in shape with a circular hole in the center. Six are 7/16-1/2 inch in diameter with one being 3/8 inch in diameter. Four were recovered from the fill deposits and three from the river bottom clay stratum. The buttons may have been attached by means of a wooden or leather "rivet" which passed through the central hole. The remains of such a "rivet" may be present in two of the specimens. (Photograph 4)

D. Tacks

Two tacks were recovered. The head of a brass tack measuring 7/16 inch in diameter was recovered from the fill in TC A (#7.6). The shank,

which was broken off, has a square cross-section and is welded or soldered to the head. A second tack head, 3/8 inch in diameter, was recovered from the fill, in TC C (#54). This head is of discolored brass or some other metal. It is likely that these artifacts are furniture tacks. Noel Hume (1970:22) notes that brass tacks with welded brass shanks were used to "ornament and anchor the leather of straight-backed side chairs of the second quarter of the 17th century." However, these tacks measured up to one inch in diameter. "Smaller tacks were used around the skirts of seventeenth century chair seats" (Hume 1970:228).

E. Wooden Head (Photograph 6)

A carved wooden head of a man, 3/8 inch in height, was recovered from the gray clay stratum of TC B (#45). When excavated, this artifact was waterlogged but, through an accident of storage, it was allowed to dry out and substantial shrinkage occurred. In its present form, the head can be interpreted as having Indian features. Indian combs of the period often had carved wooden heads as ornamentation. The head was recovered from the same gray clay stratum as the comb discussed below. However, in its original waterlogged form, probably closer to its shape when originally carved, the features appeared more African. This is interesting insofar as documents indicate that at least some of the 17th century filling was done by slave labor.

F. Wooden Comb (photograph 7)

A fragment of a wooden comb was recovered from the gray clay stratum in TC B (#45). It measures approximately 1 3/4 inches in length and 7/16 inches in width at its widest point. Two pairs of incised lines and another, single incised line at the base of the teeth are visible on one side of the fragment, while only one pair of lines and the single line are present on

the other side. It is likely that the decoration on the undamaged comb was the same on both sides. Two of the teeth of the comb, 7/16 inches in length, are present on the fragment, as well as the stubs of three other teeth which have been broken off.

G. Comb Tooth

A small, tapered piece of wood, 13/16 inches in length, 1/8 inch wide, and 1/16 inch thick was recovered from the gray clay in TC B (#45). It has beveling on the edges and traces of cut marks. Upon examination it appeared that this artifact is a tooth from the above listed comb, and, in fact, we were able to match this tooth with one of the stubs on the body of the comb.

H. Beads

Wampum bead (#45) - This tubular shell bead, ¼ - 5/16 inches in length, was recovered from the stone "basement floor" feature in TC B. This type of bead is common on contact period Indian as well as early colonial sites. The beads were manufactured by the Indians and traded to the colonists, who used them as a medium of exchange. Two types of wampum were in use. The more highly valued was purple and was made from the colored portion of the shell of a hard shell clam (Mercenaria mercenaria). The other type was white and was made from whelk shell (Busycon spp.). The present specimen is of the latter type. This bead was whole when excavated but was damaged during subsequent handling and is now in fragmentary condition.

Glass bead (#43.85) - This artifact from the TC C fill deposits is a long glass bead. The fragment recovered is 1 3/8 inches in length although it was apparently originally longer. Its diameter is 3/32 inches. The bead has striations running lengthwise. The original color may have been blue although this is difficult to determine because of the patination. Noel Hume

(1970:54) notes that long cylindrical glass beads were in use from the seventeenth through at least the beginning of the nineteenth century.

Barrel-shaped bead (#54.2) - This bead was recovered from the TC C fill deposits. It is 3/16 inches in length and flattened on the ends with a maximum diameter of ¼ inch. It is white in color and is manufactured either from glass or a very hard type of shell or coral. (Photograph 8)

I. Cork Stopper

(Catalog #57). A cork bottle stopper was recovered from the fill deposits in TC B[1]. Its diameter in its present dried out condition is 5/8 inches. A hole running lengthwise through the cork may have been made when the bottle was opened.

J. Wooden Strip

(Catalog #45). A strip of wood, approximately 15 inches in length with a maximum thickness of ¼ inch and maximum width of 9/16 inch was recovered from the TC B gray clay. It has ridges running lengthwise on both sides, is tapered, probably purposefully , on both ends and is slightly curved. Its function is unknown but it could be a strip of decorative molding used either on furniture or architecturally.

K. Bottle Glass

Fifty-three pieces of curved glass, from both bottles and drinking vessels, were recovered from the test excavations. Several pieces are worthy of mention.

Bottle Base (#52.1) - The base of a large green glass bottle, with heavy patination, was recovered from the TC B gray clay stratum. The base is round, approximately 4½-5 inches in diameter, and has a pontil mark and approximately a 1½ inch kick. Noel Hume (1970:62) notes that prior to the mid-seventeenth century most bottles were square sided with a flat base. This specimen would therefore date subsequent to the mid-seventeenth century. (Photograph 9)

Bottle Lip (#45) - A fragment of a green glass applied string lip was recovered from the gray clay stratum in TC B.

Bottle Base Fragment (#14.27) - A small green glass pontil mark and kick was recovered from the TC A fill stratum. The kick is approximately 7/16 inches high. The size of this artifact indicates that it is probably part of a glass pharmaceutical bottle such as these illustrated by Noel Hume (1970:72, fig. 17). Noel Hume (1970:74) notes that the conical basal kick did not appear in these bottles before the mid-17th century.

Lip Fragment (#14.35) - A small fragment of a green glass bottle lip was recovered from the same TC A stratum as the above artifact. The relative thinness of the glass suggests that it may be from the same pharmaceutical bottle as the basal portion discussed above.

Bottle Neck (Auger test 3.2) - A fragment of a thick, green glass bottle neck was recovered from the auger test. No mold seam is visible on the fragment. The neck is flaring, with no lip. Noel Hume (1970:75, fig. 17) illustrates an early seventeenth century "flask" type pharmaceutical bottle with this shape.

Basal Fragment, Rectangular-shaped Bottle (#2.6) - This pale green glass fragment was recovered from beneath the basement floor in TC A. The vertical edges of the bottle were beveled. The bottom of this bottle fragment contains a black "iron pontil" mark. According to Newman (1970) this characteristic was present on bottles manufactured between 1840 and 1870. Ketchum (1975:34) notes that the bare iron pontil came into use shortly before 1854 and that this technique was used until about 1870. However, according to Muncey (1970) pontil marks with a black residue are characteristic of bottles manufactured during the 1860's. Furthermore, Lorrain (1968) notes that so-called 'French squares' which were "tall, four-sided bottles with beveled

edges" were first manufactured during the early 1860's. The presence of this artifact in the sub-floor deposits raises the possibility that the concrete basement floor was laid down several years after the documented 1858 date of construction of the present structure. The fact that this is the only artifact datable later than the date of construction and the absence of any artifacts datable after the 1860's suggests that the dirt floor was sealed by the concrete floor covered with slate shortly after the construction of the building, with the three course brick floor probably added later.

L. Prunts

Two glass prunts (decorative pieces of glass added to goblets) were recovered from the excavations. One, from the TC B gray clay stratum (#45) has a stippled outer surface. The second, from the TC A fill deposits (#8), has a smooth outer surface and is heavily patinated. A third prunt was recovered from a flotation sample taken from the TC A fill.

M. Decorative glass Element

A piece of amber glass with ridges from the TC C clay deposits (#55.2) may represent a decorative element from the base of a goblet which was added in a manner similar to the prunts noted above.

N. Straight Pins

Eleven straight pins were recovered from the excavations. These range in length from 2.0 to 2.6 cm. and have wire wrapped heads. According to Noel Hume (1970:254), this type of head was in use from the beginning of the 17th century through the early 19th century. Hume notes that most pins were made of brass with a few iron pins also being manufactured. At least ten of the pins appear to be made of brass and the eleventh is of another unidentified metal. Originally we thought the brass pins (or some of them) were gold, but a jeweler's test for gold was negative. The shininess of the metal and lack

of discoloration probably is related to the anerobic condition of the fill. Six of the pins came from the same fill stratum in TC A (#12.8 - #12.12; #14.1). Five were recovered from TC C fill, three of these from the same level.

O. Nails

A total of 133 nails (including two larger metal spikes) were recovered from the excavations. Until the last decade of the 18th century all nails were hand wrought and all of the identifiable nails recovered from the 17th century fill and river bottom deposits (except one to be discussed below) were of this type. Nails recovered from 19th century contexts can be useful for dating. However, the rusted and corroded condition of most nails has made identification difficult. Manufacture of machine cut nails began in the 1790's and of the 26 nails recovered from the strata immediately below the cellar floor and from the building wall trench, all were either cut or wrought nails. The first wire nails were produced in the 1850's, although they did not come into wide use until the third quarter of the nineteenth century (Nelson 1968). The fact that no wire nails were recovered from the 19th century sub-floor deposits supports the inference that the concrete floor was poured at the time the building was constructed or shortly thereafter.

One nail, however, was identifiable as a wire nail. (Photograph 10) It is 3 5/8 inches long. The shape of the head, which protrudes over the shaft only on one side suggests that it may have been a finish nail. It also has somewhat unusual gripper die marks. The point of the nail may have been hand hammered. According to Nelson (1968) the earliest wire nails were only available in small sizes and have bulbous heads. Larger nails such as this example were not available until the last quarter of the 19th century. The wire nail (#42.6) was recovered from the bottom level of the 17th century fill deposits in TC B. There were no other artifacts in the TC B fill, suggesting that the fill was

disturbed. The excavators noted that this nail was found embedded in the west wall of the test cut with only some 1½ inches projecting into the test cut. While it is not uncommon in excavations for intrusive objects to be present in a stratum due to the action of roots, rodents, etc., the nature and location of these deposits preclude the presence of most of these disturbances. Furthermore, there was no difference in soil color or texture to indicate that the area in which the nail was found had been disturbed. The presence of this 19th century artifact may explain the absence in the northeast corner of the test cut of the stone "basement floor" which overlay the fill deposits. As noted previously, probing in the west wall of the test cut indicated that the feature continued to the west only in the south portion of the west wall and was absent from the northern portion where the nail was found. It is possible that subsequent to the laying down of the concrete basement floor and possibly at the time that the brick floor was added, excavation for some purpose took place adjacent to the location of our test cut. This may have resulted in the removal of the earlier stone floor and the disturbance of the underlying fill deposits. If the nail was deposited at the time this excavation was back filled and the excavated area was adjacent to our test cut, the nail could have been driven through the wall to protrude into the area of the test cut. This interpretation is admittedly speculative and could only be tested through further excavation.

P. Roofing Tiles

Twenty-six fragments of clay S-shaped pan tiles were recovered from the fill and river bottom deposits. Fifteen of these were recovered from TC A and eight from the TC B clay stratum. These were used as roofing tiles. Six other pieces of terra cotta tile were recovered from TC A. These were probably also used for roofing.

Q. Porcelain "Insulator"

A porcelain object, apparently elliptical in shape, was recovered from the stratum underlying the concrete basement floor in TC B. The object is 1 1/8 inch wide and 11/16 inches thick. It is perforated by a 3/16 inch diameter hole, apparently used to attach this object by nail or screw. The "front" side is glazed and has the molded letters "CROUSE," apparently the name of the manufacturer. The reverse is unglazed and the center is raised some 3/16 inch above the edge of the object. This object may have been used to secure electrical wire, with the wire wrapped around the raised center. If this interpretation is correct, it would date this object well after the 1858 - 1860's date when the soil deposits were probably sealed by the poured concrete floor. However, field notes indicate that this object may have been associated with the intrusive auger test hole, made during the preliminary testing. When the auger test encountered what turned out to be the stone "basement floor" feature, the test was terminated and the area surrounding the auger test was incorporated into TC B. It is possible that this object was originally part of the debris which littered the basement floor prior to testing, and may have fallen into the auger test hole before or during the breaking up of the brick and concrete floor in the TC B area.

R. "Gunspalls"

Six chert or flint flakes were recovered from the test excavations. Such flakes were produced by prehistoric native Americans as a by-product of tool making activities. However, European colonists also produced these flakes for use in "flint-lock" muskets. The flakes recovered from the excavations could have been deposited in the soil of lower Manhattan prior to the arrival of the colonists and deposited with the landfill. However,

no other native American artifacts were recovered in the fill, suggesting that these flakes may have been produced by the colonists. One flake (#56.18) shows indications of use wear on one edge. Noel Hume (1970) notes that 17th century gunspalls were used as struck off from the stone core without further preparation unlike 18th gunflints which were manufactured from prepared blades and had a characteristic shape. Therefore, it is difficult to distinguish between aboriginally and colonially produced flakes on strictly morphological grounds. Further analysis of the type and origin of the stone and the wear marks on the flakes might permit such a determination to be made, however.

Three of the flakes (#17.7, 46.67, and 12.20) were recovered from the fill deposits and three (#65.7, 56.18, and 56.20) from the underlying gray clay. One of the flakes (#65.7) was manufactured from a light brown colored chert-like stone but has a black outer cortex. The other flakes were manufactured from a dark gray or black chert or flint. One (#56.20) may be an argillaceous type of stone.

In addition to the above flakes, four other chunks, chips and/or spalls were recovered. These were probably also produced during the manufacture of gun spalls or prehistoric stone tools, but do not have the characteristic bulb of percussion and striking platform found on flakes. All of these were recovered from the TC C fill deposits. Two are gray, one black, and one light brown in color. In addition, a fractured chert pebble from the TC B gray clay deposits is chipped on the edge of the fractured face and may have been intentionally fractured.

S. Leather

A total of 347 pieces of leather were recovered from the test excavations. Most of these probably represent fragments of shoes or scrap leather

from shoe manufacturing. The major portions of two shoes and a large part of a third were recovered from the 17th century fill in TC B[1]. Large portions of two other shoes were recovered from the clay deposits in TC B and C. These shoes are discussed below. Thirteen additional pieces of leather were identified as portions of shoe soles and five as heels or heel fragments. Seventeen other pieces were tentatively identified as portions of shoe uppers and 58 pieces as shoe laces or strips or stages in their manufacture. The TC C fill deposits (#53) yielded a piece of leather from which shoe soles were apparently cut, providing additional evidence that debris from shoe manufacturing was included with the fill. This "pattern" is a two-ply piece of leather measuring roughly 6 by 6 inches but of irregular shape. Shoe soles were apparently cut from several places. One edge has a rounded indentation approximately 2½ inches wide at the edge of the pattern and a trace of an adjoining cut-out. A second edge has a similar indentation approximately 2 3/4 inches wide at the pattern edge. One side of the pattern is slightly curved with a thin strip extending outward at the top of the pattern, as if a sole had been cut from this side of the pattern.

Of the 347 pieces of leather, 56 have holes indicating that they were originally sewn. 220 of the pieces can be identified as having been cut from larger pieces.

T. Shoes (figure 8)

Substantial portions of a number of shoes were recovered from the excavations, providing examples of construction methods and styles of the period. Several pieces from the same shoe were recovered from the TC B river bottom clay deposits (#45). A stacked heel made of nine pieces of leather, graduated in size, is held together by five wooden pegs arranged in a cross pattern. One peg protrudes from the top of the stack. This fits beneath a two-ply

piece of leather with a hole which fits over the protruding peg. This piece of inner sole may have been cut from a two-ply pattern similar to that discussed above. The inner sole of this shoe was apparently produced in two portions, front and back, as the piece fitting over the heel appears to have been cut off, not broken. The total thickness of the heel/inner sole combination is 1½ inches. Portions of a second shoe were recovered from a separately excavated level (#52) within the TC B clay deposit. An entire inner sole is attached by means of wooden pegs, seven of which are still present, to at least two additional underlying pieces of leather. A large hole is present at the heel portion of the inner sole where the heel was originally attached. The length of the inner sole is 8 3/4 inches and it has a rounded toe.

Portions of what are probably two children's or small women's shoes were recovered from the clay deposits in TC B[1] (#63). These were, therefore, deposited adjacent to the shoes described above. The first shoe has an inner sole 6¼ inches long. The toe appears to be square. The sole has traces of peg marks, but none of the wooden pegs are present.

Much of the upper portion of this shoe was recovered. Two separate pieces comprised the back of the shoe. These wrapped around the inner sole and were stitched to it. Two separate pieces were recovered which formed the side of the shoe. A strip of leather extends from each side, with an approximately 1/8 inch hole near the end. These pieces covered the instep. A separate "wing-shaped" piece of leather with two 1/8 inch holes apparently formed a decorative element on the instep. The holes match those in the side pieces mentioned above. The points of the decorative wings pointed away from the wearer. Warwick, Pitz, and Wycoff (1965:259) illustrate a children's shoe with this type of decoration. The upper portion of the front of the shoe was also recovered. This part also apparently curved under the inner sole

and was attached by stitching. A second inner sole measures 6½ inches in length. This also has peg marks. This inner sole, however, has a rounded toe and several additional layers of leather are present beneath the inner sole.

Portions of two shoes were recovered from the clay deposit in TC C. One shoe shows elements of construction similar to that of the "child's" shoe described above. The inner sole is approximately 8 inches long; however the front portion is missing so it is not certain if the toe was square or round. The two back and side portions of the uppers with 1/8 inch holes as described above were recovered. These were stitched to the bottom of the shoe. The "heel" portion of a second two-ply inner sole was recovered from the same level. A second piece of leather apparently attaches beneath the inner sole. A third piece of leather fits at the back of the inner sole on the inside of the shoe, suggesting that this may be a portion of a sandal or slipper.

The fill in TC C (#53) yielded the rear portions of two inner soles. One had five small holes which were probably made by pegs used to attach the heel, in a similar manner as the inner sole and heel recovered from Catalog #45.

The TC B fill (#42) yielded a 9½ inch long portion of an inner sole. However, the front portion was damaged so that it was not possible to determine the toe shape.

Studies of historical costume have proceded largely through studies of pictorial evidence (Warwick, Pitz, and Wycoff 1965). This evidence suggests that in the last quarter of the 17th century, the style in shoes tended toward square toes, high heels painted red, and high tongues or fronts. Ties replaced the earlier shoe rose as a fastening, being in turn, replaced by

buckles after approximately 1680 (Warwick, Pitz, and Wycoff, 1965; Holly & Schwabe 1929). The sample obtained from the present excavations is not large enough to draw any definite conclusions. However, the results do suggest that archaeological materials have the potential to revise the history of style. Such material would probably better reflect the range of styles prevalent at a certain period as well as the styles popular among various social classes. The excavated material did provide an example of the high heels supposedly popular at this time. However, two of the soles have a clearly rounded, rather than a square toe. No shoe buckles were recovered from the excavations. However, several thin strips of leather may have served as ties or laces. This would be consistent with deposition of the fill during the 1680's.

The most complete specimen recovered, a child's shoe, does have a square toe. However, in their illustrations of colonial American children's shoes, Warwick, Pitz, and Wycoff (1965:259) show a square toed shoe with "wing" decoration similar to this specimen, but date this style to approximately 1720. Based on the other evidence discussed elsewhere in this report the shoe recovered from TC B^1 would have been deposited during or prior to the 1680's. In this case the weight of archaeological evidence suggests that the stylistic analysis based on pictorial evidence should be modified.

U. Coral

A substantial quantity of coral was recovered from the excavations. With the exception of a few very small pieces from the fill in TC C, all of this coral was recovered from the gray clay river bottom deposits. The largest amount, 101.34 pounds, was contained in the TC B clay deposits. In contrast, only 9.24 pounds were recovered from the TC C clay and less than a pound (.88 lb.) from TC A. None was recovered from TC B^1, but this is

not comparable to the other figures since only one level of the clay deposit was excavated and because of the much smaller size of the excavation. The possible significance of this distribution is discussed in the following chapter.

Examination of the coral indicates that two types appear to be present. By far the most prevalent is a type with cups having widths between 1-2 mm. A second type with cup width of 8-9 mm was present in TC B[1] (#63). However, it should be noted that most of the large amount of coral recovered from TC B was weighed and discarded in the field so that not all pieces were available for laboratory examination.

We were not able to determine the place of growth of these corals. However, while individual corals can grow in colder waters, reef corals of the type producing the large pieces excavated grow only in tropical waters, not much further north of 23½ degrees north latitude. Thus, the nearest coral reefs would be found in the neighborhood of Bermuda, the Bahamas, and the West Indies (Smith 1948). The most likely explanation for the presence of the coral in the river bottom deposits is that it was carried here as ballast in the holds of ships and thrown overboard while the ships were docked. This would explain the presence of coral in the river bottom clays, but not in the fill deposits.

Non Diagnostic Materials

Large quantities of materials associated primarily with the construction of buildings were found in the three test cuts. Brick, both red and yellow, dressed stone, mortar and wood were all found in large quantities.

Brick and Mortar

More than 32 kg. of brick were recovered, of which 7 are yellow brick,

generally identified as "Dutch" or "Swedish" brick (Becker 1977), brought as ballast in Dutch ships during the 17th century and used here as trim or for architectural detail (Huey, personal communication). We hope in the future to analyze trace elements in this brick, and by comparison with brick of known origin, establish a more positive identification as to its source. Red brick is more common and less diagnostic. No bricks with identifying marks on them were located during excavation, and there were very few whole or almost whole bricks.

Brick is distributed somewhat differently than other artifactual materials, in that in each test, by far the greater quantity of brick was in the clay than in the fill stratum, both by actual weight and by weight per unit of volume (Table 3). This relationship holds for both red and yellow brick, with the exception being TC B^1 for yellow brick where the frequency is so small as to be irrelevant. However, in both TC B^1 and TC C, there is 1/3 to ¼ the quantity of brick in the clay stratum (gms./ft.^{3}) than in A or B.

The distribution of mortar does not parallel that of brick. In two of the four test cuts, more mortar was recovered from the fill than the clay, while the reverse is true in the others. TC B yielded less mortar than any other (in gms./ft.^{3}) test unit, approximately ¼ that of TC A which had the most.

Wood

Although some of the recovered wood has clearly been cut and/or dressed, most pieces were too small to permit a determination of the extent to which it has been altered by man. For purposes of tabulation, therefore, we decided not to distinguish between cut or dressed wood and unmodified wood. Most wood identifiable as dressed consists of pieces of board. Some

barrel parts were also recovered, including one bung (discussed previously). One post with a painted tip was found.

The only species of wood that was distinctive to botanically unsophisticated individuals were several pieces of rattan or bamboo found in TC A in the clay deposits (#22). Much of the remaining wood appears to represent a variety of hardwoods and some softer woods. A total of 34.95 kilograms of wood was recovered from the excavations, of which 8.14 came from TC A, 16.97 from TC B, 2.99 from TC B^1, and 6.85 from TC C. All of the tests combined yielded 5.88 kg. of wood from the strata identified as fill and 26.91 from the sub-fill strata.

Building Stone

Table 1 shows the amount of stone recovered which was tentatively identified as building stone (brownstone, slate, bluestone, etc.). We did not attempt to analyze this artifact category because in only a few cases could stone be identified as being dressed. Much of the stone was present as small pieces and may have been naturally occurring.

Miscellaneous

Other architectural non-diagnostic materials recorded during analysis include a number of pieces of metal and window glass which could not be identified further and some tile fragments. The majority of the latter were from "pantiles" and were recovered from TC A fill. Pieces of window glass, unidentifiable nails (too corroded to distinguish manufacturing technique) and unidentifiable metal (too corroded to identify shape) were all found in the fill strata, with nearly all of the glass coming from TC A, while the nails and metal were mainly found in TC C.

Organic Materials

Because of the excellent preservation conditions provided by the consistent dampness of the fill, an unusual quantity of organic material was

recovered from the 64 Pearl Street excavations. This includes faunal specimens (animal bone, shell, fish scales), and botanical specimens, mostly in the form of seeds and nuts. Other specimens in this category include straw, a leaf fragment, hair, and fabric (see Table 6).

Shell

The shell was sorted into the most common types, and weighed. Oyster (Crassostrea virginica) is by far the predominant type, by approximately 50:1. Hard shell clam (Mercenaria mercenaria) is the next most frequent type, with soft shell clam present about ½ to 1/3 as often as hard shell. A few other types - present in very small quantities - mussel, and a variety of snails (some tentatively identified as olivella) are present in very small quantities. These are evenly distributed among test cuts and strata and will be identified more precisely at a later date.

The distribution of shell within the site shows some variation, reflected clearly in the quantities of oyster seen in Table 1 and the density of all shell by volume in Table 4 . The clay stratum in TC B shows a significantly greater amount of shell, either in grams or gms./cubic foot, exceeded in this case only by the amount in the fill stratum of TC C. Some of this shell represents natural deposits as indicated by the fact that a number of whole shells were found in and below the clay deposits. Pearl Street was supposedly named for the deposits of oyster shells present there (Moscow 1978). However, it is clear that there were different depositional factors at work in TC B and C. This will be discussed further below.

Animal Bone

Animal bone was identified in the lab, with the assistance of Thomas McGovern, Ph.D. of Hunter College. Only some of the mammal bone was identifiable at the species level. The results are presented in Table 5 . It should

be clear that the data represent counts of bone fragments. The collection is too small for data manipulation, or any attempt to calculate minimum numbers of individuals or meat weight. Of the identifiable mammals, cow (Bos taurus) is the most frequently represented animal, with sheep and goat (Ovis/Capra) the next most frequent and pig (Sus scrofa) third. A few bones from deer (Odocoileus virginianus), domestic dog (Canis familiaris) and cat (Felis domesticus) were also recovered. A number of the bones were burned, some quite intensely (less than 5 percent), and some show marks made by the chewing of a variety of small animals (dogs, rats, or similar rodents). There are also indications of the type of butchering technique used (cleaving vs. sawing). The mammal bone will be analyzed more intensively at a later time with comparably dated material from the Stadt Huys Block Site so that the sample size will be enlarged, permitting quantitative analysis.

A small percentage of the bone (less than 5 percent) consisted of bird bones. While most of these have not been identified as to species, some turkey (Meleagris gallopavo) or goose (Anser anser) bones were identified, as well as a number from smaller species, not necessarily domesticated. A fuller analysis of these bones will also be undertaken when the Stadt Huys faunal material is analyzed.

More than half of the bones recovered, going by number of bones rather than weight, are from many species of fish. Some of these were identifiable: cod, sturgeon, sheepshead, and a variety of smaller fish. These too require expert analysis and will be identified with the Stadt Huys Block materials. The same is true for the fish scales recovered, many of which are complete enough to allow species identification by the shape and pattern of markings on the scales. A few pieces of crab claw were also found in the excavation. There are not enough to say for certain whether they represent a species that

was eaten, or simply one that was present in the environment.

What is interesting about the faunal material, even as analyzed at the relatively unsophisticated level that was possible, is how heavily dependent the inhabitants of the area were on domesticated animals. What we know about life in earlier New Amsterdam and New York suggests that there was extensive trade with local aborigines. In other early colonial settlements there was trade in foodstuffs with local Indians, but apparently that was not practiced in the New York of the latter portion of the 17th century. Nor does it seem to have been the custom for local colonial settlers to have hunted for deer or other animals. Perhaps this is because the Dutch relations with Indians were relatively hostile by this time (Van der Zee and Van der Zee 1978), or it may have to do with a pattern established by the Dutch, for whom hunting was not a normal part of their subsistence practices.

Fishing was clearly common, and from the large species represented, some of the fishing may have been done far from shore. The Dutch and English both made much use of boats for transport, and fishing could have easily been integrated into that activity. On the other hand, there is seasonal variation tion in the location of most fish species, the larger ones coming in closer to shore in colder months (Ursin 1977). Thus, the presence of larger species may reflect seasonal patterning of fishing activities.

In terms of the distribution of animal, fish and bird bone by test cut and stratum, the same pattern noted for other types of material persists. The greatest number of bones was recovered from the clay stratum of TC B and the fill stratum of TC C, the latter having more than 5 times as much material as the former.

Plant Remains

The seeds and nuts that were recovered were identified initially in

the lab, and then checked by Roberta Taylor, a paleoethnobotanist from Temple University. The species recovered are listed in Table 6 and fall into two categories, fruit seeds and nuts. Peach (Prunus persica), watermelon (Citrullus vulgaris) and sour cherry (Prunus cerasus) were the dominant types recovered, all of which Van der Donck suggests the Dutch imported and planted (1655:14-15). A few pumpkin seeds were also recovered.

Hickory (Carya sp.) and hazelnut (Corylus americana) were the most common nut types, with some fragments of white oak acorn and chestnut also occurring. One piece of coconut (Cocos nucifera) was also recovered from the clay of TC B. A number of as yet unidentified fragments of lichen, moss, straw, and leaves have also been recovered and will be identified in the future. By far the greatest quantity of botanical material comes from the clay stratum of TC B, and the most frequent species present is Prunus persica, or peach, possibly because of its large size and relatively tough pit.

Flotation samples were taken from the fill and clay strata of each of the three major test cuts (A. B. C), and flotation has been done. The samples have been dried, and are in the process of being sorted. Once again, they will be analyzed in conjunction with comparably dated material from the Stadt Huys Block to increase the sample size for analytic purposes.

Distribution

It should be noted that a common pattern was observed in regard to brick, wood, bone, shell, vegetal material, and diagnostic artifacts. Although the proportions varied, each category of material was found in greater densities in the river bottom clay deposits than in the overlying fill in TC A and B (with the exception of bone in TC A) with the greatest densities being found in the TC B clay deposits (Table 7). For TC C, densi-

ties are greater in the clay deposits only for brick and wood. The fill deposits from this test cut have much greater densities of shell, bone, vegetal material, and diagnostic artifacts than those calculated for the clay stratum. This is probably due to the presence of a domestic midden deposit in the soil which comprised the fill at this location.

V

SUMMARY AND CONCLUSIONS

The information recovered through the analysis of the material excavated from the basement of 64 Pearl Street falls into three general categories. One type consists of information about land filling: when was this specific piece of land filled, who owned it, where did the fill come from, and how was the land made? The second category of information consists of inferences which can be drawn about the way of life of a particular population in a given time and place, as represented in the material culture of that group. Finally, the data shed light on the history of construction on the site.

Before discussing our conclusions, a brief consideration of the representativeness of the material is necessary. Any body of archaeological data is a sample of the whole material culture (plus faunal and botanical remains) of a population. It consists especially of objects lost, broken, or thrown away. The relationship of the sample to the whole is biased in typical archaeological situations by at least two factors: differential preservation of materials and the way in which a society disposes of its refuse. For example, separate places might be designated for disposal of different types of materials (Schiffer 1977). Where fill is concerned, there is an additional source of possible lack-of-fit between the sample and the population as a whole,

namely those factors conditioning how a specific type of material was selected for fill and from where it was taken.

The only body of artifactual material large enough for analysis was that from the fill and from the clay riverbottom deposits: no other significant deposits were recovered. The fill, although containing lenses of differing colors and in most cases two strata (one with a greater concentration of organic material in it) seems to have been deposited all at one time, or within a period so short as to be unrecognizable by archaeological means. The presence of cultural material in the fill suggested several questions having to do with how land was made. They will be considered below.

A. Land Filling

The question of exactly when the land on which 64 Pearl Street is located was filled, who filled it, and from where the fill was taken does not appear to be answerable from the documentary sources alone. However, analysis of excavated material in combination with documentary research suggests certain conclusions.

As far as the date of filling is concerned, the documentary research indicates that the earliest possible date is 1687, after the water lot grants were issued; and that the filling of the northernmost 80 feet was probably completed by 1692, after the Council gave its attention to this matter and ordered the lot owners to complete the filling. The southernmost part of the 64 Pearl Street lot was filled after the supplementary grants were issued in 1692. The northernmost portion of the lot was either filled by the original grantee, Peter Jansen Mesier, or the person to whom he sold the lot, either Jacobus van Cortlandt or Frederick Phillipse. It is also possible that Mesier filled part of the lot and van Cortlandt the remainder

as implied by the order of the Council to land owners including "Mr. Cortlandt" in 1691. The archaeological data support a date of filling during this period but are not sensitive enough to provide dating within this time period.

Dating

A date of 1684 for the fill was obtained on the basis of pipe stem diameters. The reliability of this date is reinforced by several facts including the lack of stems with bores smaller than 6/64 inches, the absence of clearly recognizable English pipes, and the ceramic and other artifacts. It should be noted that since fill is redeposited material, it may contain artifacts from the entire period of colonial settlement form 1625 to the date of filling. Thus there is a potential gap between the pipe stem date, representing primary deposition of material and the date of filling. However, since the population of New Amsterdam was increasing dramatically over this 65 year period, from 270 people in 1636 to 2000 in 1675 and 4397 in 1698 (Rosenweicke 1972, cited in Roberts, nd) increasing quantities of artifacts would be deposited as time progressed. Therefore the deviation of the pipe stem date from the actual filling date, although not quantifiable (since one cannot necessarily assume a rate of deposition that is exactly proportionate to the population size), should be relatively samll.

The possible period of filling is between 1687 (after the water lots were granted) and 1700 when a house was known to be in existence. The artifactual evidence supports a date early in this period.

Source of fill

The archaeological excavations have shown that, unlike the later filling, which the council ordered to be carried out with "dock mud"

from the river bottom, the earlier fill used soil from dry land. A possible clue to the source of the fill is the presence in the excavated deposits of a quantity of shoe leather, leather scraps, and perhaps most significantly a leather "pattern" from which shoe soles had apparently been cut. We can thus assume that debris from shoe manufacture was present on the lots from which the fill material was taken. Since the available documentary evidence suggests that the owners of the water lots were responsible for filling, presumably taking the fill from their own property, we decided to examine the records to determine the identity and location of the shoemakers in early New York.

Several sources in the historical records provide data as to occupation. One source of particular interest to us is a judgement by the Court of the Mayor and Aldermen on January 5, 1680 against the tanners and shoemakers of New York City (Pelletreau 1893:43-32). This source provides a list of shoemakers. Among these is one Peter Mesier. There is no reason not to assume that this is the same Peter Jansen Mesier who obtained the 1686 water lot grant, although by the latter date he was engaged in other pursuits. In 1675, "Pieter Janse Mesier" was listed as one of four carters who promised to work two days free for the City. (It is likely that this is merely a Dutch rendering of the name later encountered as Peter Jansen Mesier, or Messier). By the time the water lot grants were let, however, Mesier had taken up the occupation of miller, having erected a mill near the foot of Cortlandt Street between June 18, 1682 and April 23, 1686 (Stokes 1928, vol.IV:962), which is just prior to his acquisition of the water lot. The water lot grant itself describes Peter Jansen Mesier as a "Merchant" (Grant Land Underwater Liber A:15-17). Mesier operated his mill as late as 1701

when "Peter Jansen Mesier", described as a "Miller" obtained another water lot grant from the city "in front of Mesiers Mill" (Grants of Land Under Water Liber A:391). Thus we see Mesier first described in the records as a carter, then as a shoemaker and finally as a merchant or miller. It was apparently not unusual for a man to practice several occupations at least sequentially, and in a small community it is possible that individuals needed to practice several trades in order to earn a living. If, at some point around 1680, prior to operating his mill, Peter Jansen Mesier practiced shoemaking, it is likely that shoemaking debris would have accumulated on his property and been present in the later fill, even if he no longer practiced this trade at the time the filling took place.

Assuming that Mesier did fill the water lot on which 64 Pearl Street now stands, it is of interest to see where he had property from which the fill may have been taken. According to Stokes (1928, vol. IV:196), in 1674 Mesier was part owner of a lot on Bridge Street. In the 1677 tax assessment on housed and vacant land (Minutes of the Common Council 1905 vol. I:50) "Peter Janson Mezier" is listed as owning a house on the Marvelt St (the present Whitehall Street) as well as an empty lot on Stone Street (west of Broad St.). We do not know if Mesier owned any of these properties in 1686. However, a 1686 list of members of the Dutch Reformed Church (Wilson 1892 vol 1:446-452) list Pieter Jansen Messier and his wife as residing "along the Strand". The Strand was the term used to refer to the open space between the East River shore and the buildings fronting on it. Mesier must have purchased this property between 1677 and 1686, during which period he is referred to as a shoemaker and at the end of which he purchased the water lot. We do not know precisely where along

the shore Mesier's house was located. However, of the four properties owned by Mesier this was probably closest to the 64 Pearl Street lot. It is a reasonable assumption that people will use the closest available material for fill. Thus, it is possible that the fill containing what appears to be shoemaker's debris originated in Mesier's lot located along the shoreline.

There are other possible sources of the shoemaker's debris recovered from the excavations. The 1680 court proceedings list fifteen other shoemakers in addition to Mesier. the 1686 Church records indicate that two of these (Tobias ten Eyck and Carsten Leursen) resided along the shoreline, and we know that Conraet ten Eyck, father of Tobias and also described as a "tanner and master shoemaker" lived at the time of his death in 1688 in a house on the northeast corner of Coenties Slip and Pearl Street (Stokes 1928, Vol. II: 244). It is possible that Jacobus van Cortlandt or Frederick Phillipse, wealthier members of the community than Peter Mesier, purchased fill from the land of these shoemakers or other who owned land more distant from the fill site. However, the coincidence of the presence of shoemaker's debris in the fill deposits, the identification of the grantee, Peter Jansen Mesier as a shoemaker, and his ownership of a house (and presumably an associated lot) along the shoreline suggest that Mesier may have filled in at least those portions of the lot where our test excavations were conducted. This would have occurred after 1686 and probably considerably before the grants of the water lot extensions in 1692.

Process of filling

In modern times, there are two basic procedures for land filling. Either clean fill (usually sterile sand and gravel) is brought onto a

site, or a community is asked to create fill by dumping certain types of refuse. Both relatively sterile soil and material containing refuse were used for fill on the 64 Pearl Street lot; the latter is assumed to be topsoil containing debris and the former is thought to be sterile subsoil. Documentary research indicates that some filling along the shoreline was accomplished by levelling nearby hills. The presence of large amounts of artifact-bearing topsoil in each of the tests excavated suggests that this was not the case for 64 Pearl Street but that fill was taken from large expanses of land surface.

Recovery of large quantities of certain materials in the clay stratum (brick, wooden planks, and shell) raised other questions about the process of filling. Specifically, had these materials been on the river bottom before filling took place, or did they move down through the fill because of their weight (suggested in another fill situation by Wilson 1980) It was hypothesized that if the latter were the case, there should be a consistent relationship between materials in the lowest fill stratum and those in the clay in terms of the density of these items. However, examining the ratio of material density present in these two strata (Table7) it is clear that there is no consistent relationship among the three test cuts for any of the artifact categories. The hypothesis of gravity affecting the deposition of these materials is therefore rejected, and it is our assumption that brick, wood, shell and other artifacts in this context were natural river bottom debris before filling began.

Examination of Table also shows that all categories of material in the clay stratum vary similarly among the three test cuts. TC B has the greatest density in all categories (wood, bone, shell, other artifacts), TC A is next and C is last. The ratio is approximately 3:2:1 except for

shell in which TC B has a disproportionately larger quantity. This pattern may be due to the relative proximity of the various areas tested to places from which refuse could be deposited in the river. Disposal of refuse could have taken place from either the shoreline or the Great Dock, which existed in the approximate location of Coenties Slip, 45 feet to the east (Dankaert's View 1679; Burgis 1717). Therefore, the location of TC B was most accessible, being reached either from the shore or the dock, which may account for its having the highest concentration of materials.

Finally, the supposition that the proximity of the Great Dock was responsible for the presence of a large amount of material in TC B is strengthened by the presence of a large amount of coral in the clay of this test, and lesser, but still significant amounts in the TC C clay deposits. Only traces of this material were recovered from the clay deposit in TC A, located further to the west. It is our assumption that the coral (an imported material) served as ballast, and was dumped overboard when ships were loaded with furs and other materials going to Europe. There is no other simple explanation, with the possible exception of sampling error, to account for the differential presence of this material. Further, even sampling error would not explain why large pieces of coral would be carried some 30 to 35 feet out from shore to be dumped.

Having described the variation of artifact density in the clay, we should note that there was also variation in artifact density in the fill, with by far the greatest density of material found in TC C. However, there is not a consistent ratio among the three test cuts for all artifacts in fill as there is in the clay (Table 7). It is our interpretation that this variation in the fill means something different than the variation within the clay. The former is related to the fact

that composition of fill will vary according to differences in fill source, rather than unequal proximity to the dumping site.

Position of shoreline

We had hoped to identify the precise location of the shoreline. While we were not able to do this the depth and thickness of the clay stratum in the three test cuts suggest that there was a gently sloping shoreline. This interpretation was reinforced by the observation of excavations in the basement of 1 Coenties Slip, after renovation had begun. At the northern edge of this building, the clay stratum, which we interpret as the river bottom accumulation of silt, was much thinner than in any test cuts in 64 Pearl Street. It is suggested therefore, that the shoreline was under Pearl Street intself.

B. Way of Life

For the second type of analysis noted above, we attempted to acquire information about daily life in New Amsterdam and early New York. Recent analyses of colonial material (South 1977) have identified certain patterns of artifacts, or relative proportions of functional artifact categories, as being present in specific contexts. For the present data, however, the frequency of most artifact types was too low to allow a similar analysis. Whereas South lists a number of categories (kitchen, architecture, clothing, smoking, toys, etc.), large enough samples of material from 64 Pearl Street were available in only two of these: architectural material (nails, flat glass, pantiles) and kitchen artifacts (ceramics and bottle glass). These materials were compared across test cuts following South's method, with artifacts from fill and clay strata analysed together. Kitchen artifacts represented 16-43% of the total (Table 8), with the mean being 29%. Architectural material ranged from 19-55% (high figure from TC A is due

in part to an unusual number of pieces of flat glass - 122, the probable result of a single broken window and thus sampling error)with a mean of 28%. The amount of material in the "kitchen" category is consistant with South's (1977) "Frontier Pattern (Kitchen artifacts 23-34%; architectural artifacts 43-58%). However, the percentage of architectural artifacts is lower than those for the "Frontier Pattern". New Amsterdam and early New York of the late 17th century may have already passed the "Frontier" stage of development and do not match South's description of 18th century frontier settlements. The low figure for architectural debris does, however, support Larrabee's contention that early settlement stages will have little building debris included as fill (1979).

This form of analysis does not include the full range of architectural materials since, following South, brick and mortar were not included. Further, our laboratory procedures involved weighing, rather than counting, these substances. It is suggested that an analogy to the ratio of kitchen to architectural materials might be seen in the ratio of shells (primarily food remains) to brick and mortar. Wood was not included in this analysis because it can serve both domestic and architectural uses. There is no visible relationship between kitchen to architectural artifact ratios and shell to brick ratios. One anomaly should be noted: the amount of shell in the TC C fill was unusually large, including almost 32 kilos. (Table 9)

It must be concluded that South's analytic procedure is only moderately appropriate for these data, partly because of the size of the sample. It does, however, strongly reinforce observations on the variable composition of the fill deriving from source variation as percentage varied among test cuts.

Very interesting inferences can be made about food procurement

in New Amsterdam and early New York from the faunal and botanical data. For example, it is clear that the settlers fished and raised their own meat, but did not hunt or trade for hunted game. Further analysis of the animal, bird, and fish bone in combination with a larger sample may provide information not only as to what types of meat were eaten, but what cuts (stew vs. steaks and roasts) allowing inferences about commensal group size and economic position.

The plant material is all from species that could have grown in the immediate area, although at least some of the fruits were introduced by the Dutch (Van der Donck:14). It cannot be assumed without question that plant remains represent the result of eating habits rather than simple indicators of what existed in the environment. And yet if archaeologists make the assumption that prehistoric people were "optimizers" and exploited whatever was available, why should the same behavior not be attributed to historic settlers. In that case it could be assumed that the existence of clearly edible resources, not requiring elaborate preparation, in the environment implies their use by the inhabitants. What cannot be derived from these data, mostly because of the small sample, is what proportion of different fruits, nuts and vegetables were consumed, and what the entire diet consisted of.

Shellfish remains found in the fill will also be assumed to represent food consumed. This is probably also true of most of the shell recovered from the clay deposits although the fact that some of the valves were attached suggest that some of the shellfish were naturally present on the river bottom. The overwhelming predominance of oyster among the specimens recovered indicates that the shoreline area was probably not characterized by mud flats, an environment required by clams. Oysters, however, require deeper waters, rocks or hard surfaces to attach themselves to and a

certain salinity level (Salwen 1968:338). Most of the oysters were probably harvested from boats.

Finally, it is clear that information on trade during the period in question is obtainable from these data. Most material that can be identified as imported comes from Europe. Almost all ceramics are Dutch or English, with a few French pieces. While the identfiable smoking pipes are mostly Dutch, there was a great deal of interaction between English and Dutch pipe-makers during the 17th century and presumed stylistic influence in both directions. None of this is surprising. There are two noteworthy points in relation to trade, however. One is the indication of trade with farther places derived from materials such as rattan, coral and coconut. Another is a comment on the speed with which innovation reached the colonial settlement. Robin's egg blue delft is said to have first been manufactured in approximately 1690 (Paul Huey, personal communicaion). Sherds of this ceramic type were recovered from fill which was probably deposited between 1687 and 1692. This suggests that the starting date for the manufacture of this ceramic may be a bit earlier than noted. More significantly, it means that there was only a brief lag between the manufacture of a new ware and its appearance in the New World.

C. Construction History

The third type of information retrievable from this analysis concerns construction techniques and the sequence of buildings on the site. This includes data on the type of floor built in two of the three buildings probably existing on the site, and foundation construction in the 19th century.

It is our conclusion that the stone feature in test cut B most likely represents the floor of the original Phillipse house built on the lot.[1]

Whether it represents the whole floor, or part of a floor (the remainder being dirt as seen in the mottled brown sandy silt stratum above the fill in test A and C) cannot be ascertained at this point. Since the exact position of the Phillipse house on the lot is unknown, we also cannot say to which part of the house the floor belongs, but further research on architecture of 17th century buildings might prove enlightening on this matter.

The existence of the post under the wall, we feel, is related to the existing foundation. Whether this was a standard 19th century construction technique is not known to us; it is likely that the method was used for filled land. We did not, for example, find similar use of posts under walls of comparable age on the Stadt Huys Block, across the street.

While we know that the foundation was built in the 19th century, it is not possible from stratigraphic evidence to tell whether the present foundation was constructed in 1858, or whether the foundation (or some part of it, such as footing stones and posts) were re-used from the postulated 1829-1830 building. The latter is a likely explanation because of the presence of the thin light sandy stratum below the concrete floor and extending over the footings. An examination of the foundation at the point where the two earlier buildings (64 Pearl Street and 34 Water Street) were joined, probably in 1858, should provide an answer to this question because it seems likely that the 1829-30 foundation would be in two parts, each associated with one of these two buildings.

Finally, we have direct unambiguous evidence as to middle-late 19th century attempts to waterproof the basement. There is clear evidence of the basement of 64 Pearl having been flooded, both from informants'

accounts and from the water marks which we noted on the supporting posts and walls. The concrete layer was put down either at the time of construction, or slightly later, and was probably topped with slate as the finished floor. It can be assumed that this floor was inadequate for waterproofing purposes, and the asphalt plus three layers of brick and mortar, known to have been present by the end of the 19th century was added later.

D. Conclusion

The 64 Pearl Street excavations have demonstrated that archaeological findings, in conjunction with the documentary record, can shed new light on historical questions. Furthermore, it is apparent that the fill deposits along the shoreline of lower Manhattan represent a valuable source of information on the way-of-life of the early European inhabitants of our city and the growth of their community. The limited nature of these excavations has enabled us to draw only tentative conclusions. However, the data obtained form the project will provide a comparative base for the analysis of material from other excavations being conducted in lower Manhattan. The growing data base should enable more definite conclusions to be drawn, including an analysis of changes which occurred during the development of New York City.

FOOTNOTES

[1]Since writing this report the authors have changed their minds about the interpretation of the stone feature in TCB. Based on our experience on the 7 Hanover Square Block, the next adjacent filled block, we now think that the stones were the remains of the bottom of a foundation wall for Phillipse's house. We had thought that the stones in TCB were too wide to be a wall, but it appears that foundation walls built on land fill were very wide (several on the Hanover Square Block were 3 feet wide). The difficulty in identifying the stones as a wall was due mostly to the fact that we were only able to see a small segment of the feature, and were restricted by the expense of breaking through the floor so that enlarging the test cut was not possible within our funding.

APPENDIX

FABRIC ANALYSIS

by

Phyllis Dillon, Museum of the American Indian, Heye Foundation

Prodedure: Longitudinal section of fibre were prepared on slides and examined under magnification (340 X). Where fibres were discernable, color, spin and fibre makeup were noted, if possible.

Summary: All discernible fabric was of plain, undecorated cloth. Most pieces were wool (where makeup was observable). Some were dyed yellow. Most fabric was badly deteriorated.

FABRIC ANALYSIS

Cat #	Test Cut	Stratum	Description	
16	A	Ia	Four separate bags of specimens 1), 4)	1) Has 2 specimens of paper and smaller fragements a) b) a) appears to be corner b) is heavier weight of paper 2) single strands of fibre which appear to be vegetal. Not thread which is a processed group of fibers. 3) 2 specimens of hair 4) fragments of yellow wool yarn made up of 2 spun fibres yarn dia. = .5 m yarn is covered with mud whole specimen is 3.8 mm X 2.1 mm
64	C	VIc	Two sep. bags	1) wad of hair, wad of straw hair 58 mm X 20 mm straw 50 X 20 2) 5 fragments of fabric 32 X 24, 30 X 20, 25 X 17, 18 X 12 mm maybe wool but yarns badly deteriorated and weave structure not discernable
48	C	Va	One bag	straw 35 X 15 mm
52	B	VIIb	One bag	hair
56	B	VIIc	Two sep. bags	1) wad of hair 50 X 20 mm 2) fragment of fabric 3.9 X 1.3 mm yarns deteriorated and no weave discernable
62	TCB'	Va	One bag	straw
58	TCC	VIb	One bag	straw

Cat #	Test Cut	Stratum	Description	
50	C	IId	One bag	straw
49	TCC	IIIa	One bag	7 specimens a) 2 filaments 16 mm, 14 mm long b) 5 fabric fragments 12 X 12, 7 X 7, 15 X 10 no weave or yarn makeup discernabl c) 1 vegetal fibre 4 X 2.5 mm long d) 2 smaller fragments of fabric
49	C	Wall Scrape	One bag	1 fabric fragment 2.6 X 2.1 mm no weave or yarn makeup discernable
57	B'	IVd	One bag	3 fragments of fabric, 1 of skin all compacted with debris, no weave structure a) fabric, folded, prob. wool 1.9 X .5 mm b) fabric, appears ribbed, 2 spun dyed reddish-yellow 1.5 X .7 mm c) skin 1.2 X 1.2 mm d) fabric, not wool 1.5 X .7 mm
4	C	IVa	One bag	fragment of fabric 2.2 X 1.4 mm no weave or yarn makeup discernable
45	B	VIIa	Four sep. bags	1) Hair 2) vegetal fibre or straw 3) Labelled thread. Not thread is a single filament, not spun Is still flexible vegetal fibre It is same as fibre in 16A Va 4) 35 specimens. 1 is paper, 1 is skin, 1 wood. Rest appears to be fabric. # 20 yellow wool fibre # 28 2 spun fibre # 35 heavy red dyed 3 spun single yarn (3 mm. diameter) (29 others are fragments where no weave or yarn structure is discernable)

Published Sources

Albion, R. S. The Rise of New York Port (1815-1860). New York: Charles Scribner's Sons, 1939.

Alexander, L. T. Clay Pipes from the Buck Site in Maryland, In The Archaeology of the Clay Tobacco Pipe, v. II, The United States of America. Ed. Peter Dabney, BAR International Series 60, pp. 37-61, 1979.

Archer, M. and B. Morgan. Fair as China Dishes. International Exhibition Foundation, 1977.

Becker, M. J. "Swedish" colonial yellow bricks: Notes on thier uses and possible origins in 17th century America. Historical Archaeology 11: 112-118, (1977).

Binford, L. R. A new method of calculating dates from kaolin pipe stem samples. Southeastern Archaeological Conference Newsletter 9: 19:21.

Bowen, J. Probate inventories: An evaluation from the perspective of zooarchaeology and agricultural history at Mott Farm. Historical Archaeology 9: 11-25, (1975).

Bridenbaugh, C. Cities in the Wilderness. New York: Knopf, 1968.

Cresson, B. F., Jr. The problems of the lower West Side Manhattan waterfront of the Port of New York. Transactions of the American Society of Civil Engineers, pp. 226-312, 1912.

DeJonge, C. H. Delft Ceramics. New York: Praeger, 1969.

Disturnell, J. New York as it is. New York: By the author, 1837.

Fernow, B., ed. The Records of New Amsterdam, vol. 6., Knickerbocker Press, 1897.

Flick, A. C. History of the State of New York. New York: Ira J. Freidman, Inc., 1962.

Harrington, J. C. Dating stem fragments of seventeenth and eighteenth century clay tobacco pipes. Quarterly Bulletin of the Archaeological Society of Virginia 9: 9-13 (1954).

Harrington, V. D. The New York Merchant on the Eve of the Revolution. Ira J. Friedman, Inc., 1902

Johnson, G. a. Rank size convexity and system integration: A view from archeology. MS. n.d.

Kardas, S. and E. Larrabee. 18th century landfill in Manhattan: An archaeological analysis of tests in the Schermerhorn Row block. Prepared for the New York State Division of Historic Preservation., 1978.

Kardas, S. and E. Larrabee. The process of city building through land making. Presented at symposium on the Archaeology of New York City, American Museum of Natural History, 1980.

Kelly, F. M. and R. Schwabe. Historic Costume. New York: Charles Scribner's Sons, 1929.

Ketchum, William C., Jr. A Treasury of American Bottles. Indianapolis Bobbs-Merrill, 1975.

Lockwood, C. Manhattan moves uptown. Boston: Houghton Mifflin, 1976.

Lorrain, Dessamae. An archaeologist's guide to nineteenth century American glass. Historical Archaeology II: 35-43 (1968).

Lossing, B. J. History of New York City. New York: The Perine Engraving and Printing Co., 1884.

McCashion, J. H. A preliminary chronology and discussion of seventeeth and early eighteenth century clay tobacco pipes from the New York State site. In The Archaeology of the Clay Tobacco Pipe, Vol-II. Ed. Peter Dabey, BAR International Series 60. pp. 63-148, 1979.

Minutes of the Common Council of the City of New York. New York: Mead & Company, 1905.

Moscow, Henry. The Street Book: An Encyclopedia of Manhattan's Street Names and Their Origins. New York: Hagstrom. 1978.

Muncey, Cecil. The illustrated guide to collecting bottles. New York: Hawthorn Books, 1970.

Nelson, L. H. Nail chronology as an aid to dating old buildings. In History News 24 (11). American Association for State and Local History. Technical Leaflet 48. Nashville.

Newman, T. S. A dating key for post-eighteenth century bottles. Historical Archaeology 4: 72-75 (1970).

Noel Hume, Audrey. Clay tobacco pipes excavated at Martin's Hundred Virginia, 1976-1978. In The Archaeology of the Clay Tobacco Pipe, V. II, Ed. Peter Dabey, BAR International Series 60, pp. 3-36, 1979.

Noel Hume, I. A guide to artifacts of Colonial America. New York: Knopf, 1970.

Pelletreau, W. S., ed. Abstracts of wills on file in the surrogate's office. New York: Publication Find Service, 1894.

Porter, G. and H. C. Livesay. Merchants and manufacturers. New York: Johns Hopkins Press, 1971.

Prudon, J. H. M. and T. N. Burditt. The Coenties Slip buildings: An historic structures report. On file, New York Landmarks Conservancy, 1979.

Roberts, J. C. Fraunces Tavern block historic district. MS. On file, Hunter College Dept. of Anthropology, 1979.

Salwen, Bert. Archaeology in Megalopolis: Updated assessment. Journal of Field Archaeology 5: 453-459 (1978).

Salwen, Bert. Muskeeta Cove 2: A stratified Woodland site on Long Island. American Antiquity 33: 322-340 (1968).

Salwen, B., S. Bridges and N. A. Rothschild. The importance of small samples from disturbed sites. Historical Archaeology 15: 79-94 (1981).

Schiffer, M. B Toward a unified science of the cultural past. In Research Strategies in Historical Archaeology. Ed. S. South. New York: Academic Press, pp. 13-40, 19[illegible].

Smith, I. G. W. Atlantic reef corals. Miami: University of Miami Press, 1948.

South, S. Method and Theory in Historical Archaeology. New York: Academic Press, 19[illegible]a.

South, S., ed. Research Strategies in Historical Archaeology. New York: Academic Press, 1977a.

Stokes, I. N. P. The Iconography of Manhattan Island 1498-1909. New York: Robert H. Dudd, 1918.

Ursin, M. J. A Guide to Fishes of the Temperate Atlantic Coast. New York: E. P. Dutton. 1977.

Van der Donck, Adrian. Description of New Netherlands in 1655: Old South Leaflets v. III. New York: Burt Franklin.

Van der Zee H. and B. Van der Zee. A Sweet and Alien Land. New York: Viking, 1978.

Werwick, E., H. C. Pitz and A. Wiscoff. Early American Dress. New York: Benjamin, 1965.

Wilson, James Grant., ed. The Memorial History of the City of New York. New York: New York History Company, 1892.

Wilson, W. Historic salvage archaeology in lower Manhattan. Bulletin of the Archaeological Society of New Jersey 36: 17-20 (1980).

Public records

Grants of Land Under Water.

New York City Tax Assessment Records.

New York City Land Records.

New York City Dept. of Buildings.

Maps

Costello Plan 1660.

Dukes View 1661.

Miller Plan 1695.

Burgis View 1717.

Bromley Map 1961.

TABLE 2

CERAMICS RECOVERED BY TEST CUT AND STRATUM

	DELFTWARE			BUFF PASTE	RED EARTHENW.		STONEWARE			SLIP-WARE	TOTALS
	MAJ-OLICA	ROBINS EGG BLUE	OTHER	YEL/GREEN LEAD GLAZE	GINGER GLAZE	OTHER	BELLARM.	WESTER.	OTHER		
TC A FILL	0	1	6	4	11	10	1	0	0	2	35
TC A CLAY	1	0	1	1	0	2	0	0	2	0	7
TC A SUB-CLAY	0	0	1	0	1	0	0	0	0	0	2
TC B AMONG ROCKS	0	1	2	1	0	0	0	0	0	1	5
TC B FILL	0	0	2	4	1	2	0	0	0	0	9
TC B CLAY	1	1	10	10	2	7	2	2	2	0	37
TC B' FILL	0	0	5	3	0	1	0	0	0	0	9
TC B' CLAY	0	0	0	0	0	0	0	0	0	0	0
TC C FILL	5	5	42	54	5	61	5	1	2	0	180
TC C CLAY	0	1	5	5	0	6	0	0	0	0	17
TOTAL	7	9	74	82	20	89	8	3	6	3	307

TABLE 3

RED AND YELLOW BRICK AND MORTAR
WEIGHT AND DENSITY BY TEST CUT AND STRATUM

	TC A		TC B		TC B'		TC C	
	GMS.	GMS/FT^3	GMS.	GMS/FT^3	GMS.	GMS/FT^3	GMS.	GMS/FT
RED BRICK CLAY FILL	596.9	184.8	2082	96.8	938	93.8	1620	86.2
	3531	464.5	14,715	1167.9	654	290.7	3024	293.6
YEL. BRICK CLAY FILL	946	44	.23	1.1	223	22.3	208	11.1
	1370	180.3	2316	183.8	0	0	927	90
MORTAR CLAY FILL	1822	96.9	100	4.6	1030	105.0	687	36.5
	484	63.7	597	47.4	144	64	241	25.4

TABLE 4

SHELL WEIGHT AND DENSITY
BY TEST CUT AND STRATUM

	TC A				TC B				TC B'				TC C			
	FILL		CLAY		FILL		CLAY		FILL		CLAY		FILL		CLAY	
	GMS	GMS/FT^3	GMS	GMS/FT^3	GMS	GMS/FT^3	GMS	GMS/FT^3	GMS	GMS/FT^3	GMS	GMS/FT^3	GMS	GMS/FT^3	GMS	GMS/FT^3
OYSTER	4977	154.1	5530	727.6	1090	50.7	14,704	1167.0	1408	140.8	598	265.8	36,488	1939.8	2350	228.2
CLAM (SP)	10	.3	113	14.9	44	2.0	616	48.9	11	1.1	0	0	451	24.0	75	7.3
OTHER	1139	35.3	14	1.8	4	.2	80	6.3	1	.1	0	0	20	1.1	40	3.9
TOTAL	5,179		3,303		1,138		15,390		1410		598		31,900		2,465	

TABLE 5

BONE COUNT, BY CLASS, TEST CUT AND STRATUM[21]

	TC A		TC B		TC B'		TC C		TOTALS
	FILL	CLAY	FILL	CLAY	FILL	CLAY	FILL	CLAY	
COW	2	6	3	19	1	0	32	> 16	> 79
SHEEP/GOAT	0	0	1	7	1	0	20	1	32
PIG	0	0	0	4	1	0	12	> 2	> 19
"MAMMAL"	0	5	2	34*	13	0	130	56	240
BIRD	0	0	2	3	0	0	16	15	36
FISH	0	5	3	41	5	2	325	69	450
UNIDENT.	0	0	0	0	0	1	0	0	1

*2 DOG/CAT, 1 DEER

TABLE 6

PLANT REMAINS BY CLASS, TEST CUT AND STRATUM (in gms)

	TC A		TC B		TC B'		TC C		TOTALS
	FILL	CLAY	FILL	CLAY	FILL	CLAY	FILL	CLAY	
PEACH	13	12	3	45	7	9	164	7	260
CHERRY	7	2	0	5	1	0	6	2	23
WATERMELON/ PUMPKIN	6	2	0	4	1	0	2	2	17
APRICOT	1	0	0	0	0	0	1	0	2
HICKORY	8	0	1	11	1	0	17	1	39
HAZLENUT	4	4	1	5	1	0	7	2	24
OTHER NUT	2	1	0	7	1	0	2	1	14
OTHER VEG.	1	0	0	1	0	0	3	1	6
UNIDENT.	4	0	0	6	13	0	22	1	46

TABLE 7

DENSITY OF MATERIALS IN THREE STRATA:
CLAY, LOWEST FILL AND ALL FILL
(GMS/FT^3)

	BRICK			WOOD		
CLAY	B 1400	A 708	C 407	B 1275	A 807	C 398
LOWEST FILL	C 327	A 215	B 2	C 168	A 158	B 25
ALL FILL	C 134	A 80	B 17	C 155	A 56	B 15

	SHELL			ARTIFACTS		
CLAY	B 1222	A 450	C 239	B 21	A 13	C 7
LOWEST FILL	C 2413	A 450	B 16	C 37	A 22	B 5
ALL FILL	C 1699	A 154	B 53	C 28	A 7	B 4

TABLE 8

COMPARISON OF KITCHEN AND ARCHITECTURAL
ARTIFACT CLASSES BY TEST CUT
(FILL AND CLAY STRATA COMBINED)

	TC A		TC B		TC C	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
KITCHEN	47	16	74	20	236	43
ARCHITECTURAL	165	55	77	21	103	19
OTHER	86	29	222	60	209	38
TOTAL	298		373		548	

TABLE 9

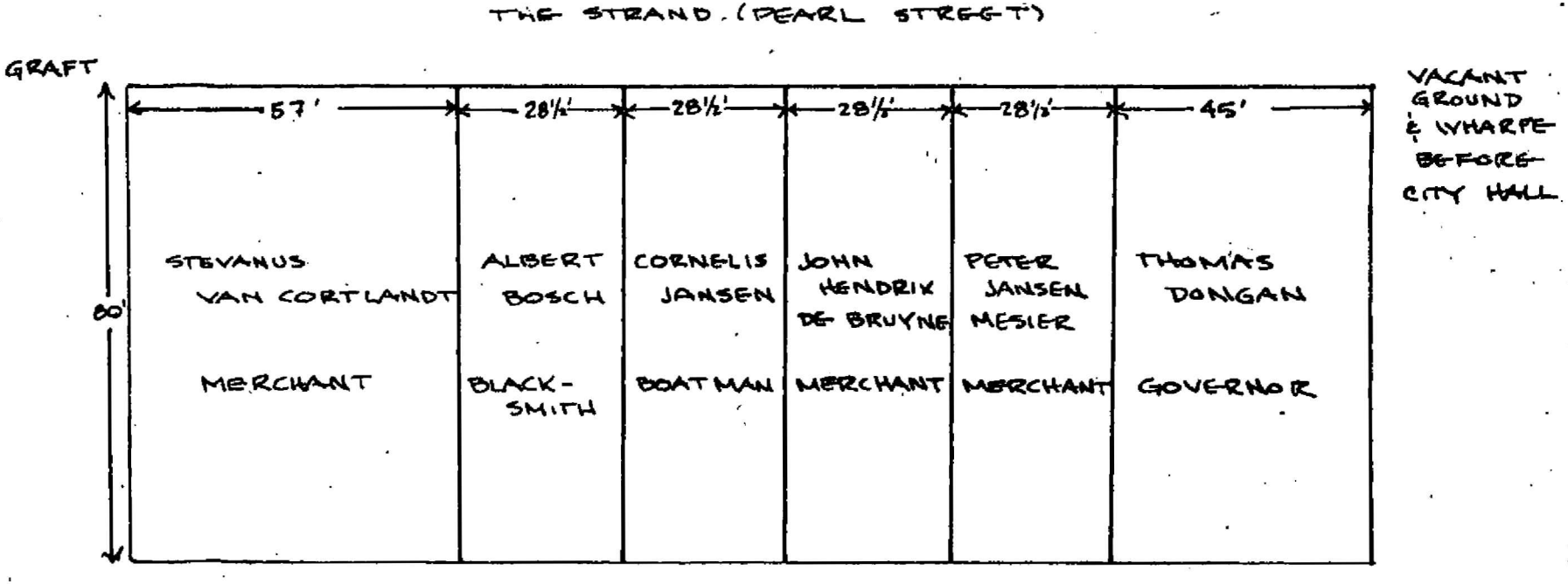
COMPARISON OF KITCHEN: ARCHITECTURAL ARTIFACTS
AND SHELL:BRICK RATIOS BY TEST CUT
(FILL AND CLAY STRATA COMBINED)

	TCA	TC B	TC C
KITCHEN: ARCHITEC.	47/165=.28	74/77=.96	236/103=2.29
SHELL: BRICK	5179/6595=:78	1138/19,136=.06	31,900/7399=4.31


PART OF
SECTION 1
Scale 160 Feet to the Inch
Bromley, Manhattan Land Book.
1955 (revis. 1974).
project area
BROADWAY
BEAVER
EXCHANGE
WILLIAM
WALL
PEARL
STONE
HANOVER
COENTIES SLIP
WATER
FRONT
OLD SLIP
BROAD EXCHANGE BLDG.
FIRST NATIONAL CITY BANK
27
WALL & HANOVER BLDG.
MUNSON BLDG.
N.Y. COTTON EXCHANGE
4 N.Y. PLAZA
U.S. ASSAY OFFICE
SUBWAY STATION
PARKING
WAREHOUSE
W.R. GRACE CO.
N.Y. TELEPHONE CO.
INTERNATIONAL TELEPHONE & TELEGRAPH
29
30
31
33
35
2

FIGURE 1

FIGURE 11A



WATER LOT GRANTS

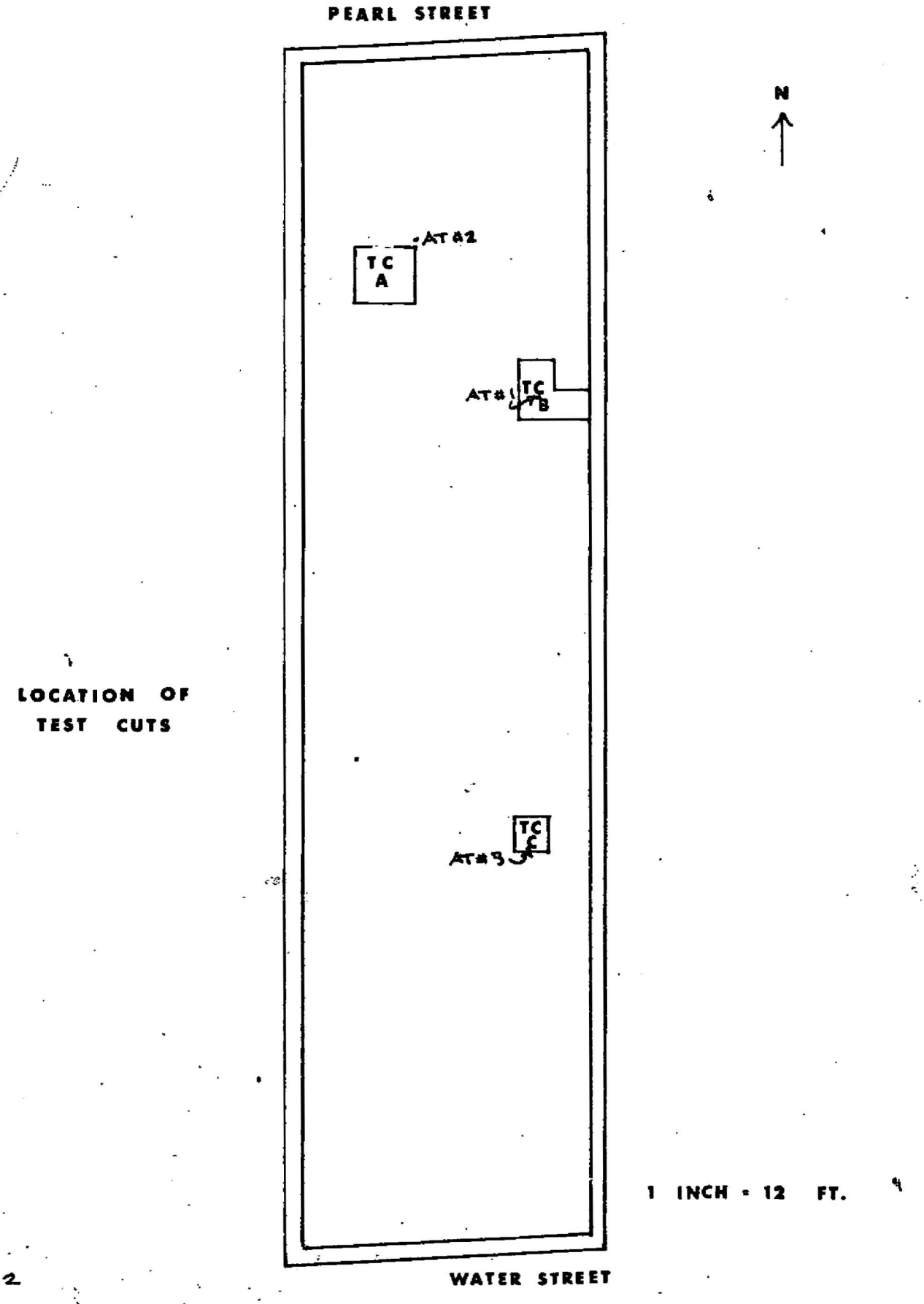

PEARL STREET
N
AT #2
TC A
AT #1
TC B
TC C
AT #3
LOCATION OF TEST CUTS
1 INCH = 12 FT.
WATER STREET

FIGURE 2

TEST CUT A

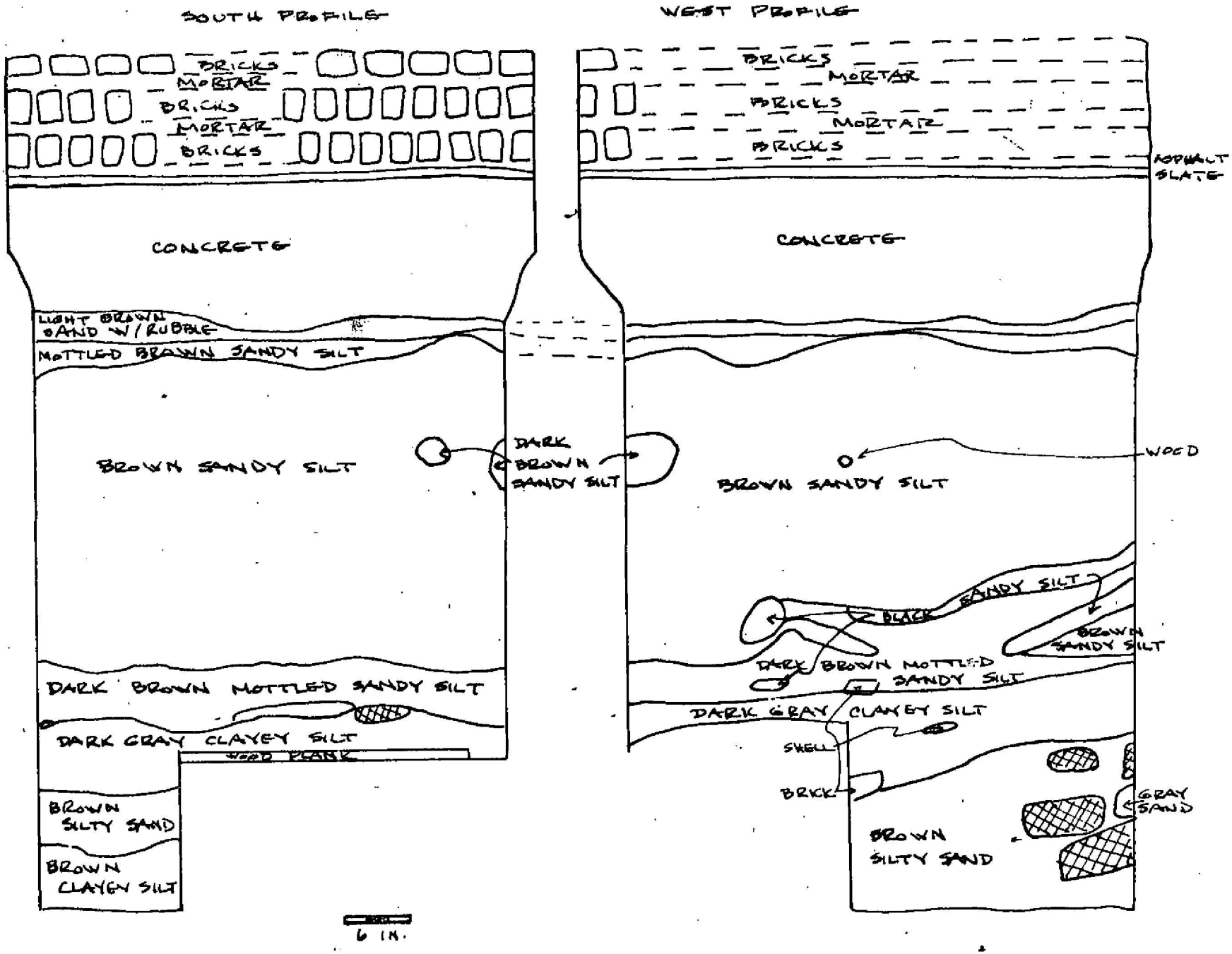


FIGURE 3

TEST CUT B

EAST PROFILE

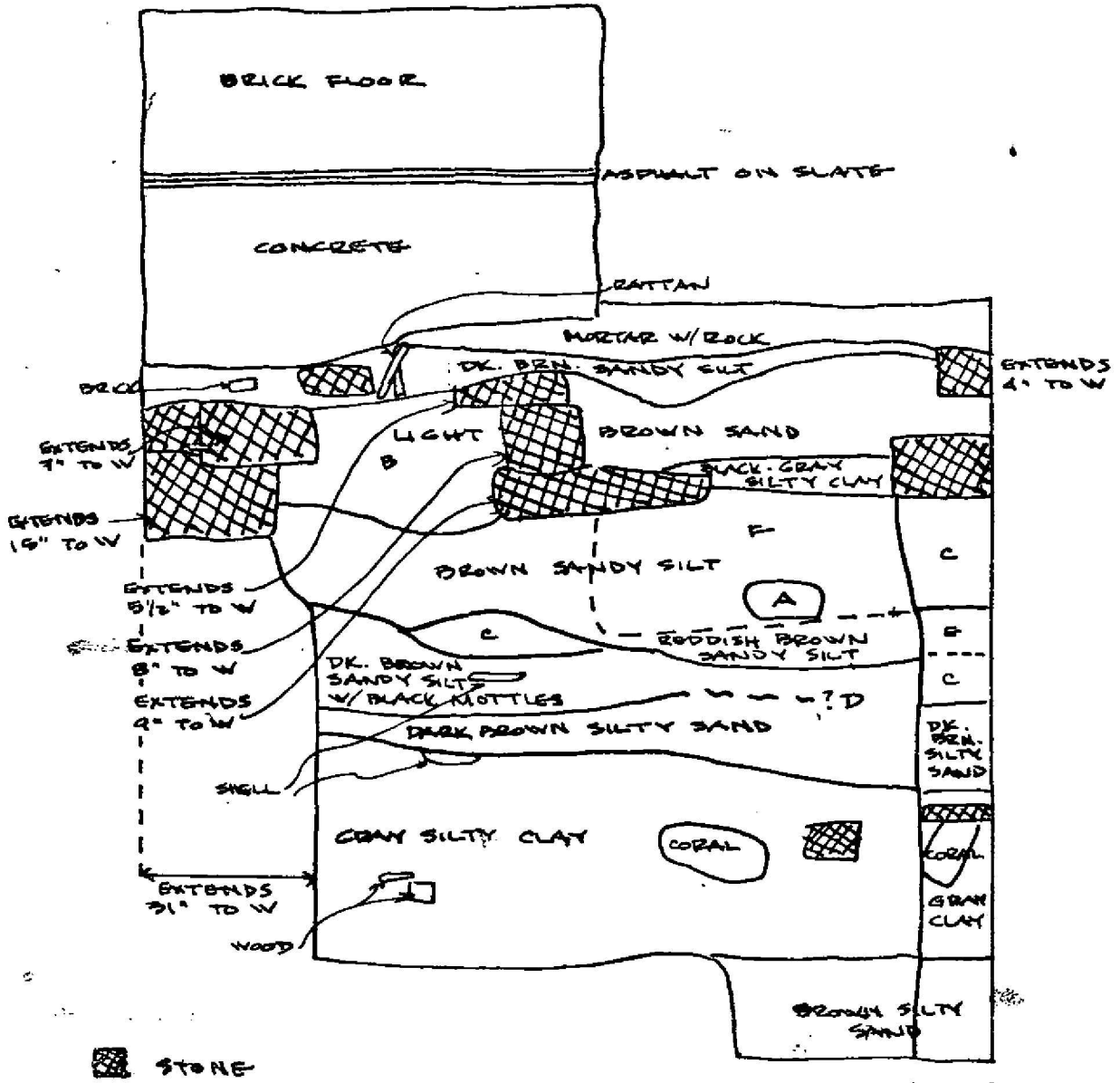


FIGURE 4

TEST CUTS B AND B'

SOUTH PROFILE

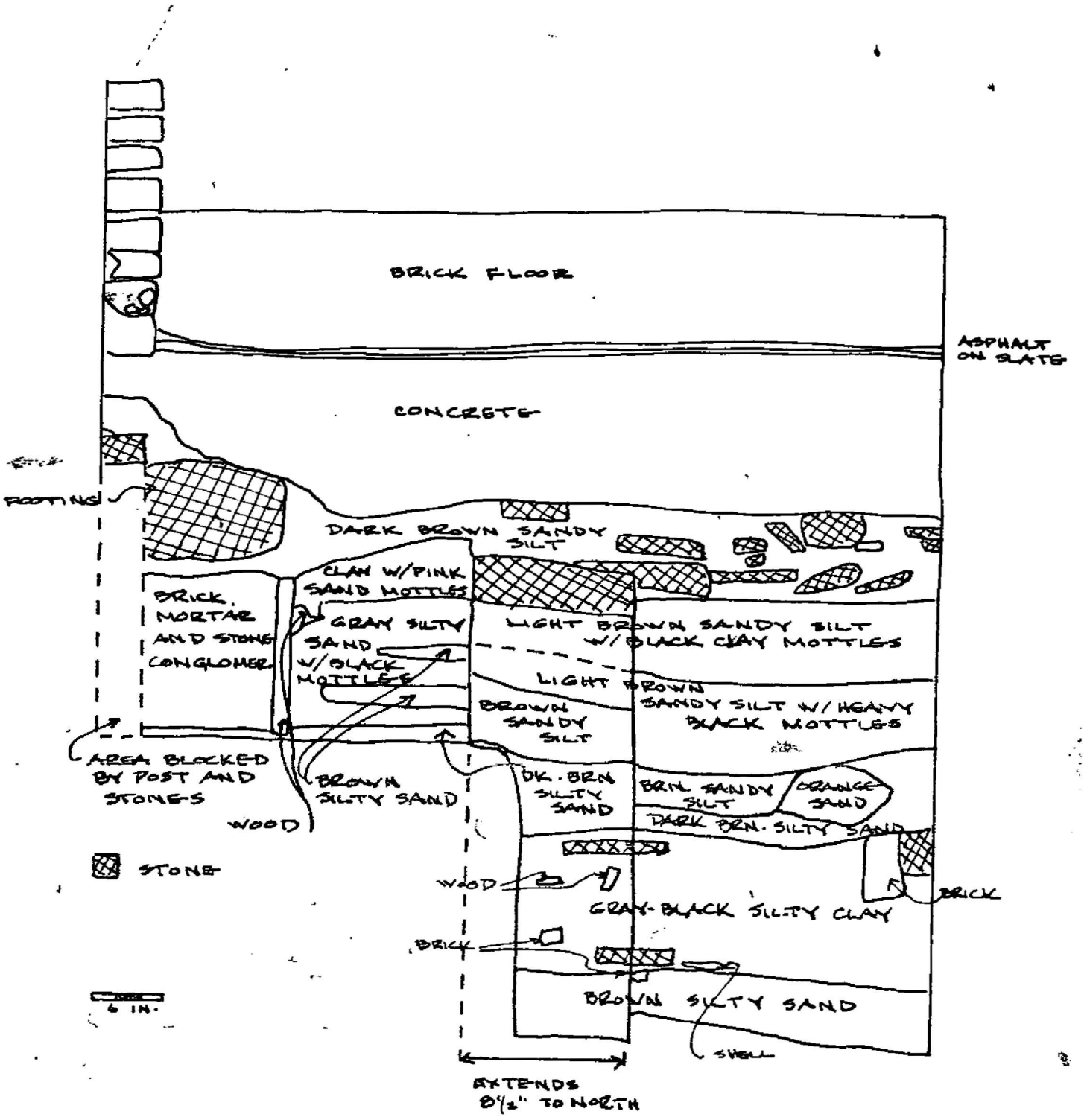


FIGURE 5

TEST CUT B'

EAST PROFILE

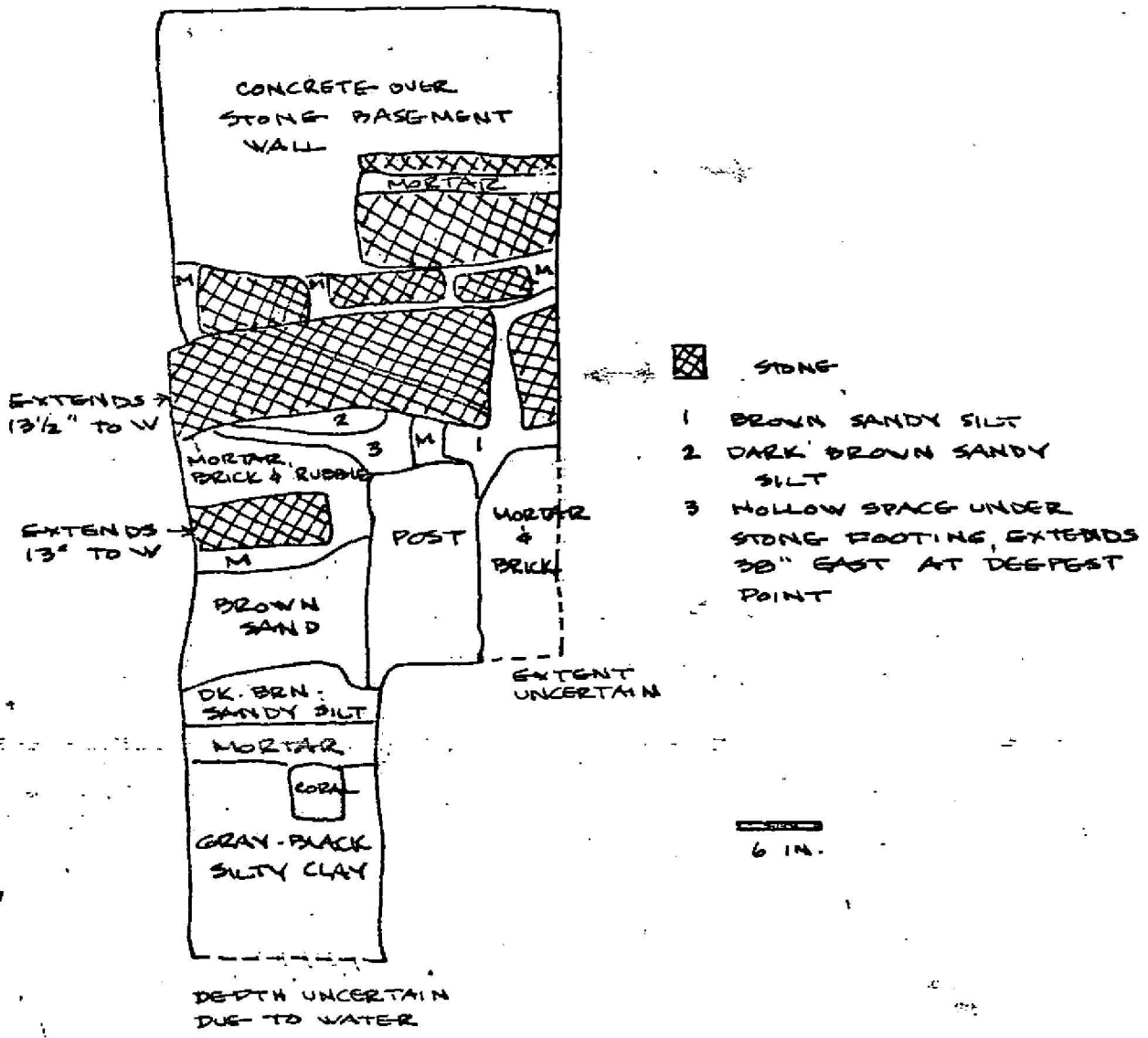
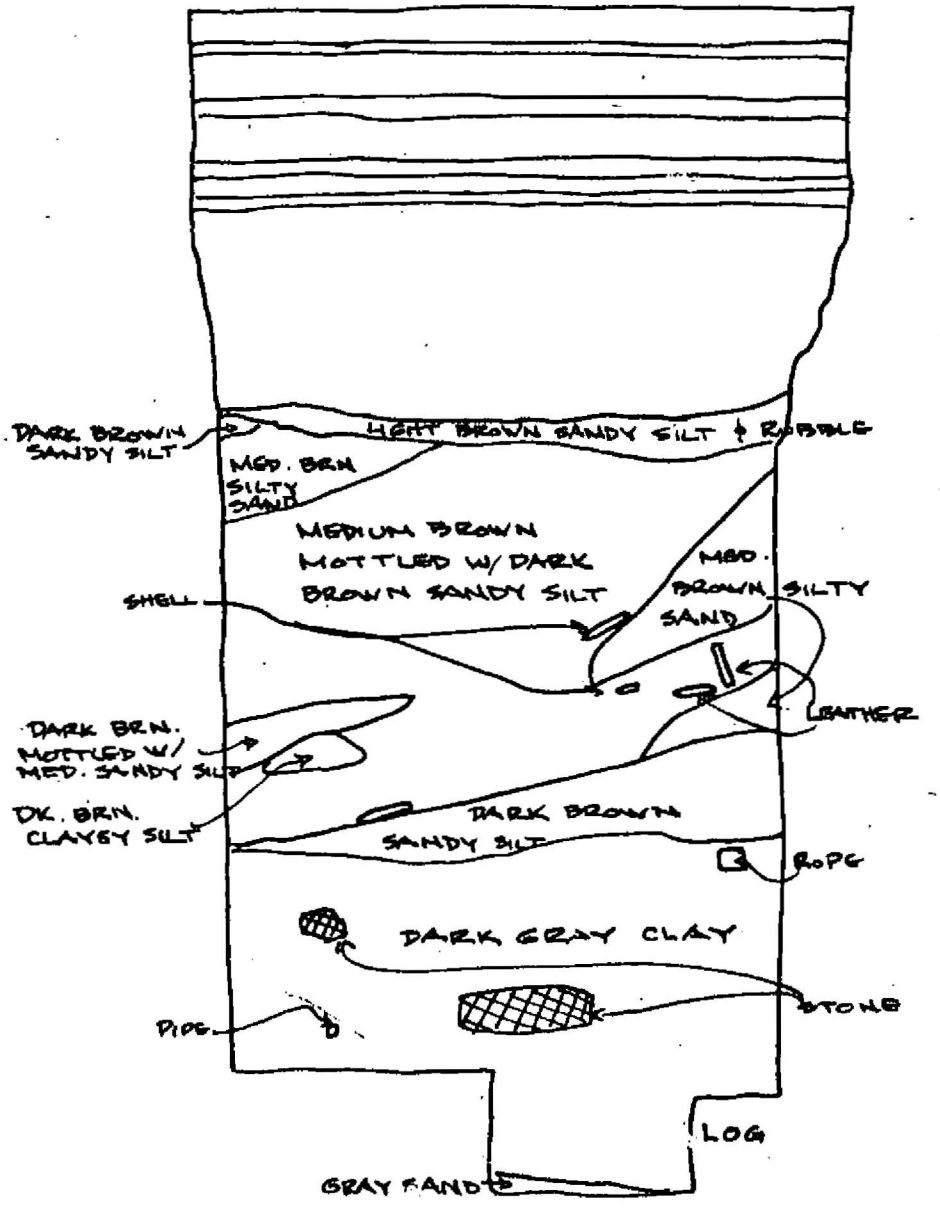


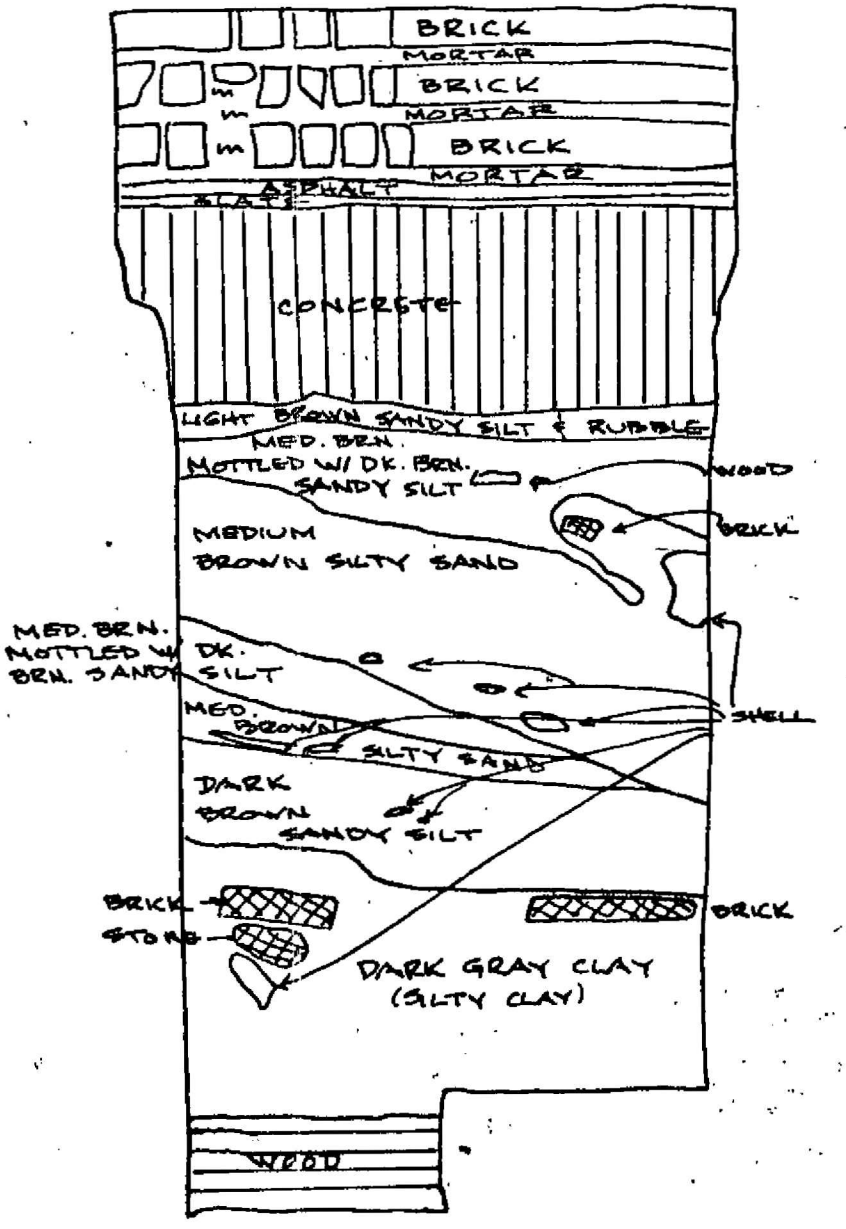
FIGURE 6

TEST CUT C

WEST PROFILE



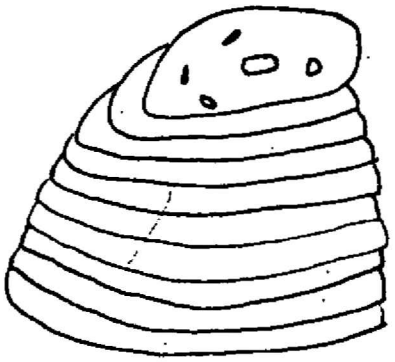
NORTH PROFILE



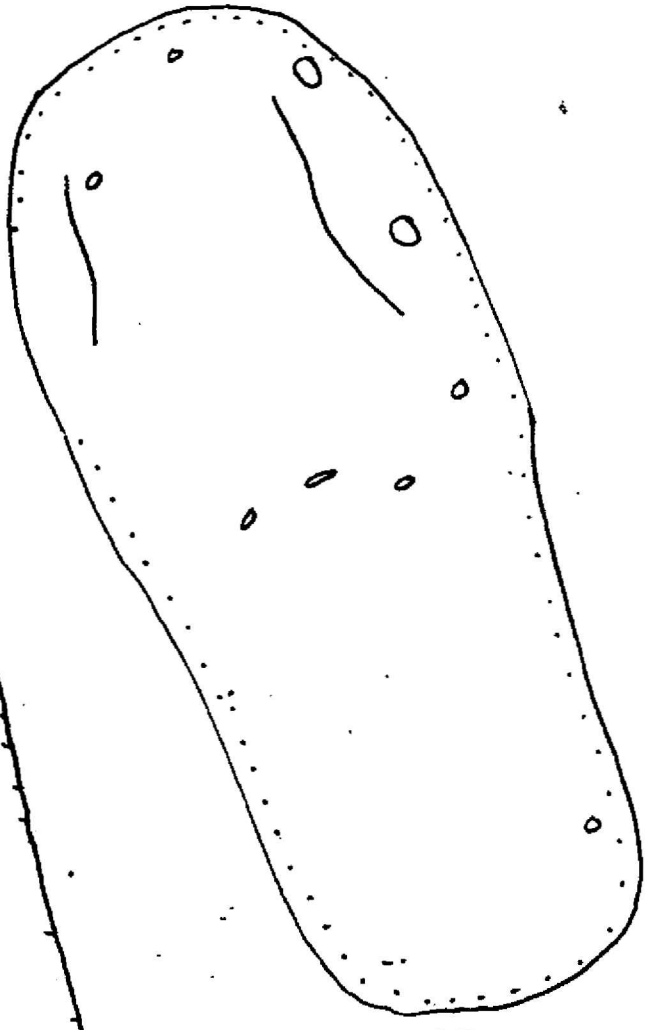
6 IN.

FIGURE 7

SHOE LEATHER
(FULL SIZE)



45



63

52

FIGURE 8

KEY TO PHOTOGRAPHS

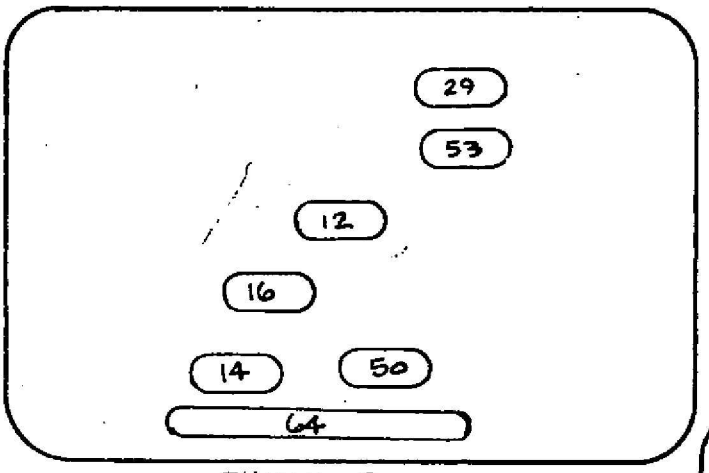


PHOTO 2

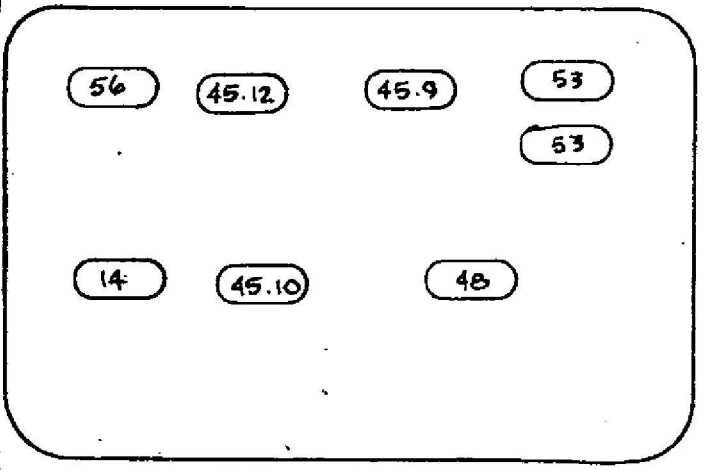


PHOTO 3

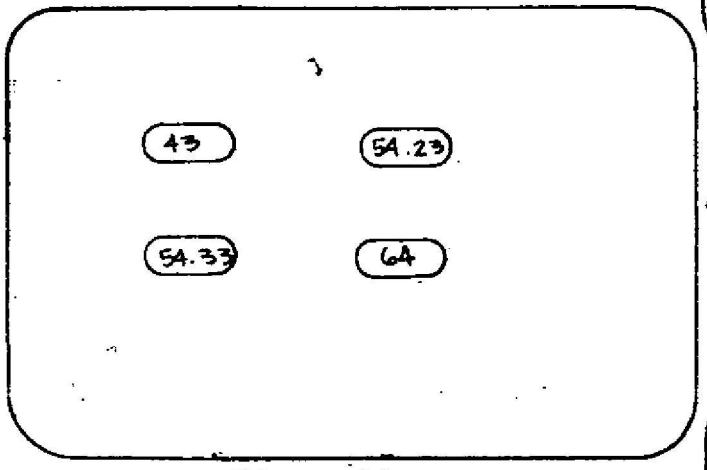


PHOTO 4

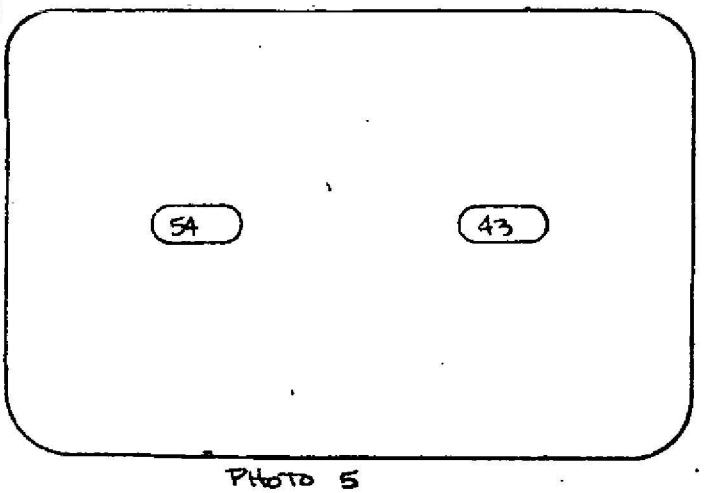
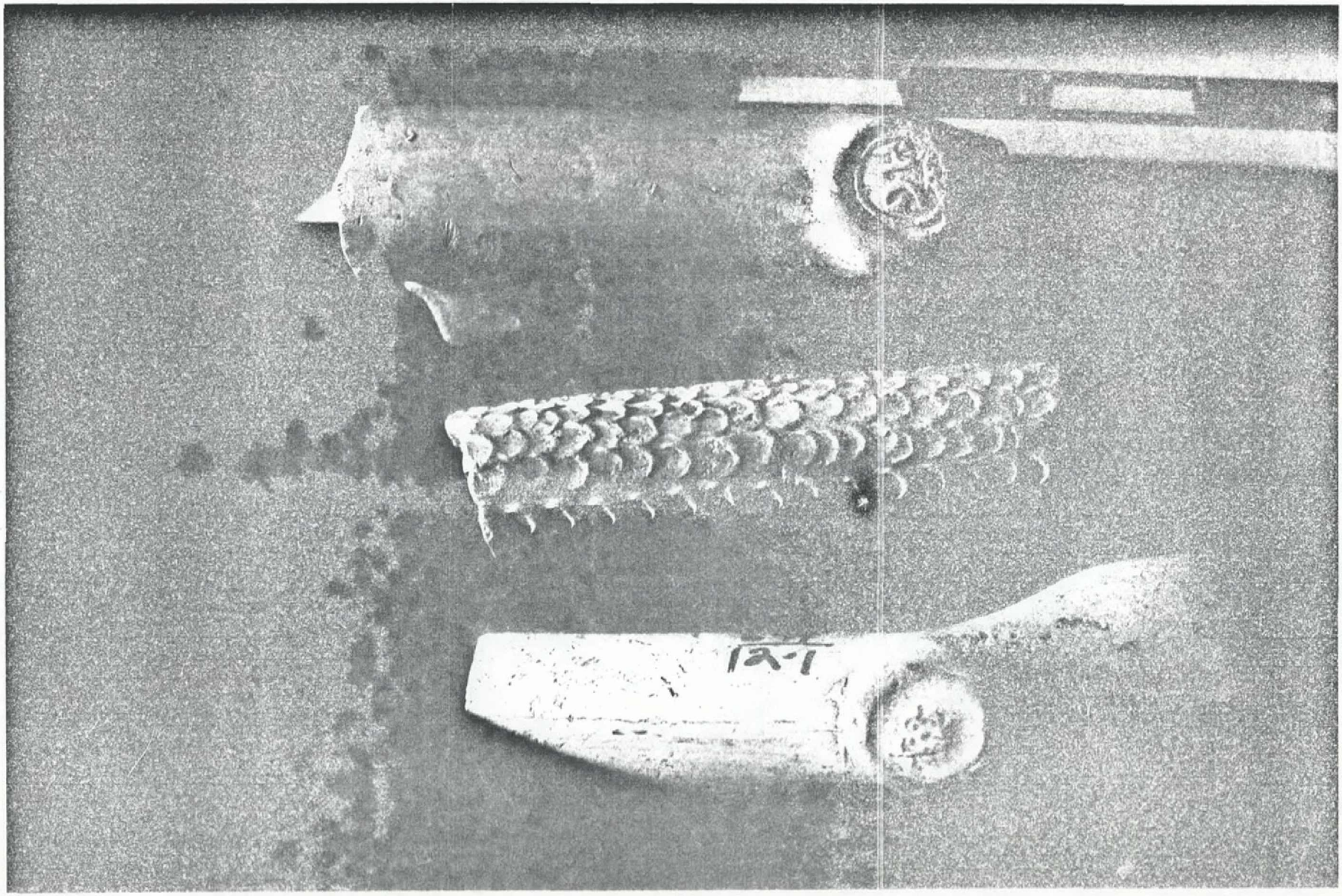
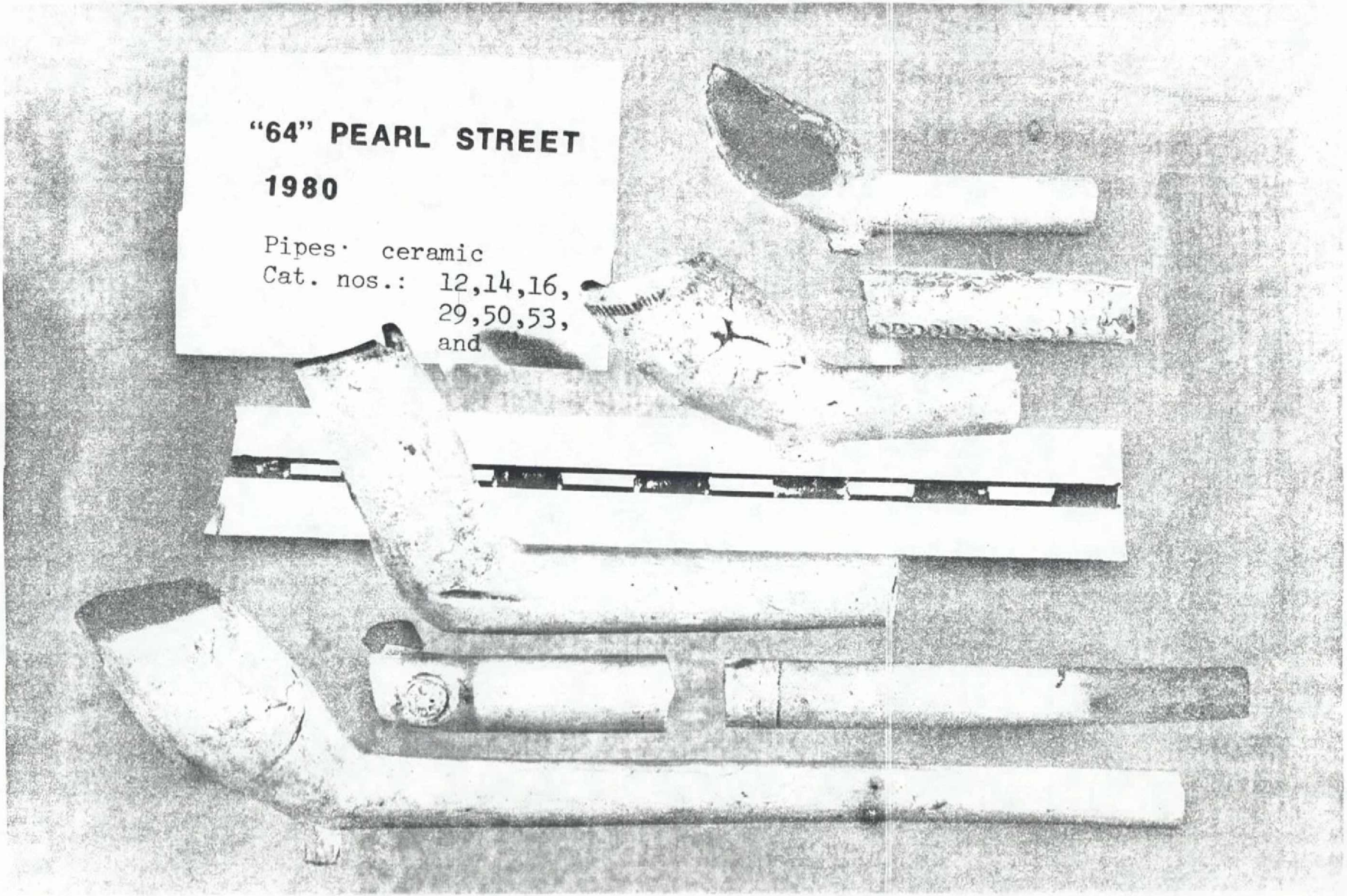
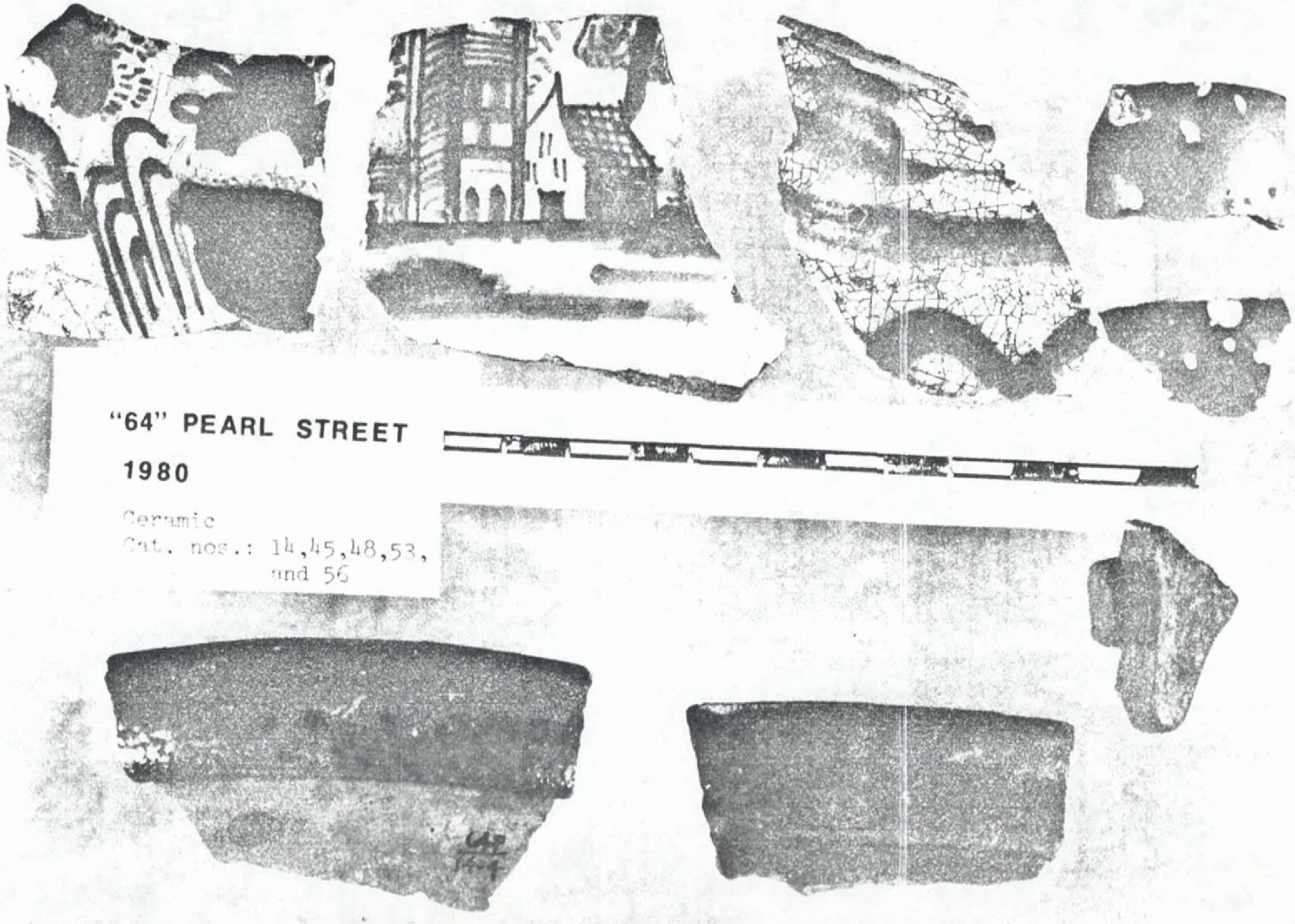


PHOTO 5



CAT. 14.8, 53., 12.1 (TOP TO BOTTOM)


"64" PEARL STREET
1980
Pipes· ceramic
Cat. nos.: 12,14,16,
29,50,53,
and



"64" PEARL STREET

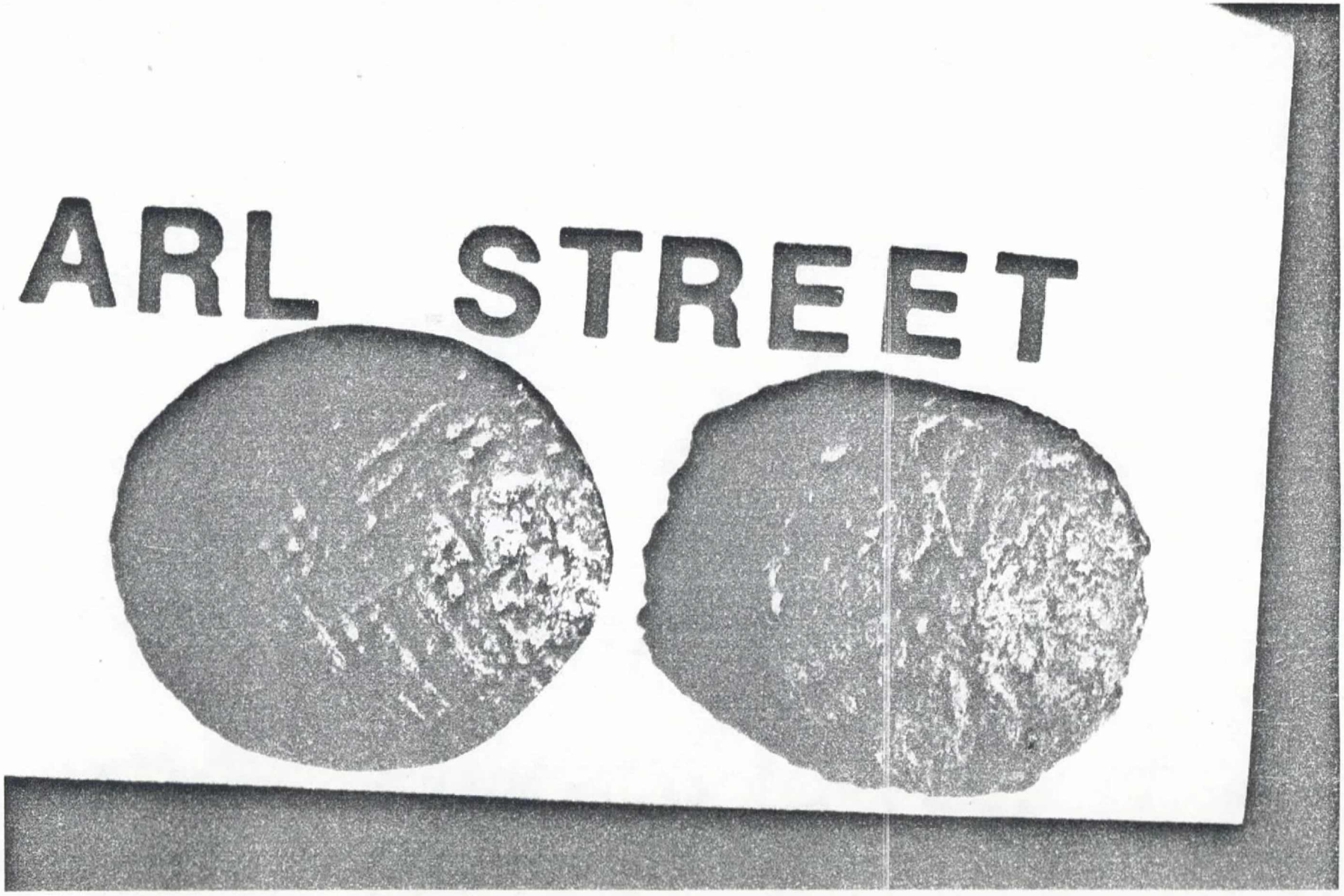
1980

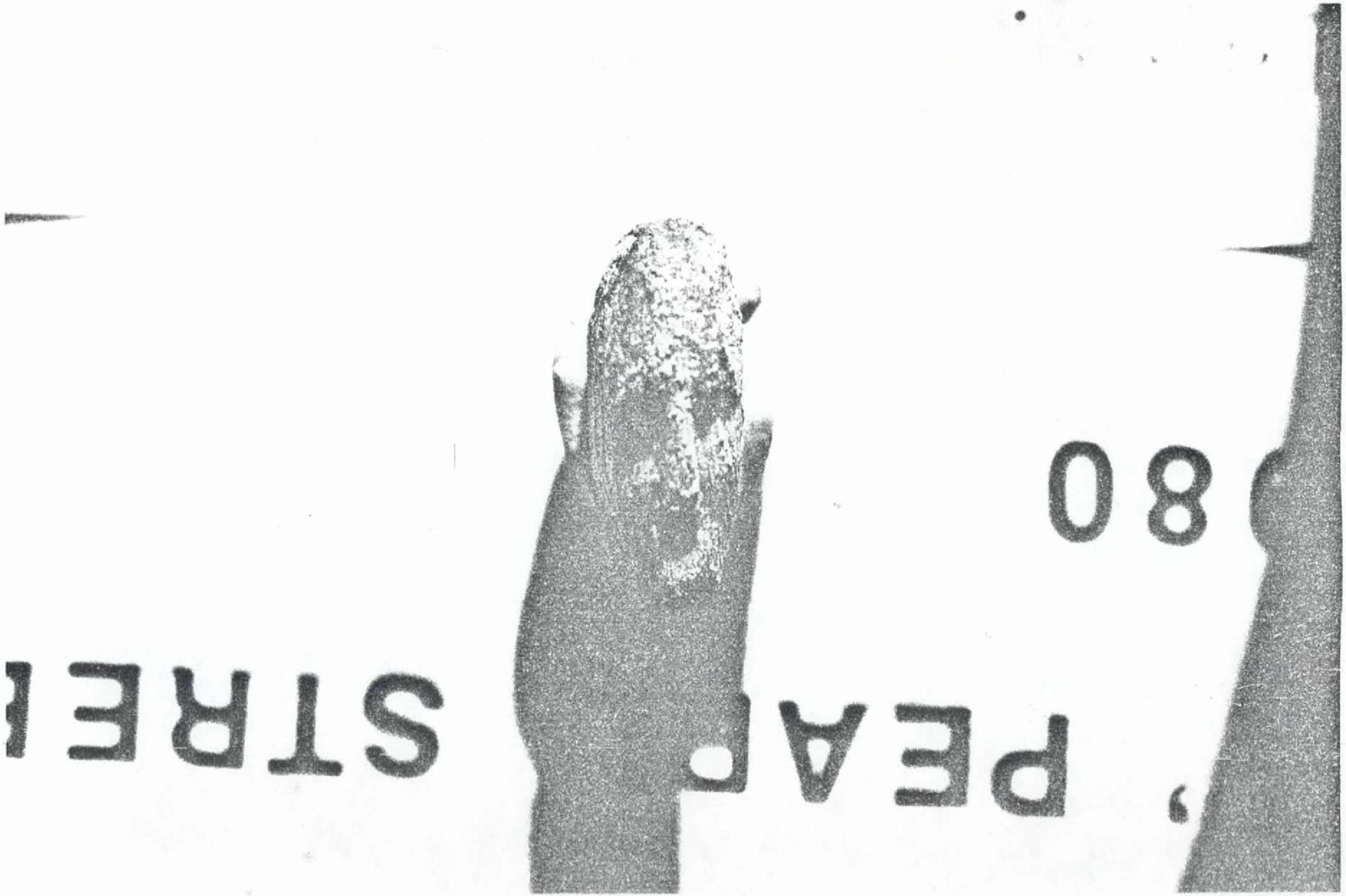
Ceramic
Cat. nos.: 14,45,48,53,
and 56

'64" PEARL STREET

1980

Buttons: metal, wood
Cat. no.: 43,54,64


ARL STREET

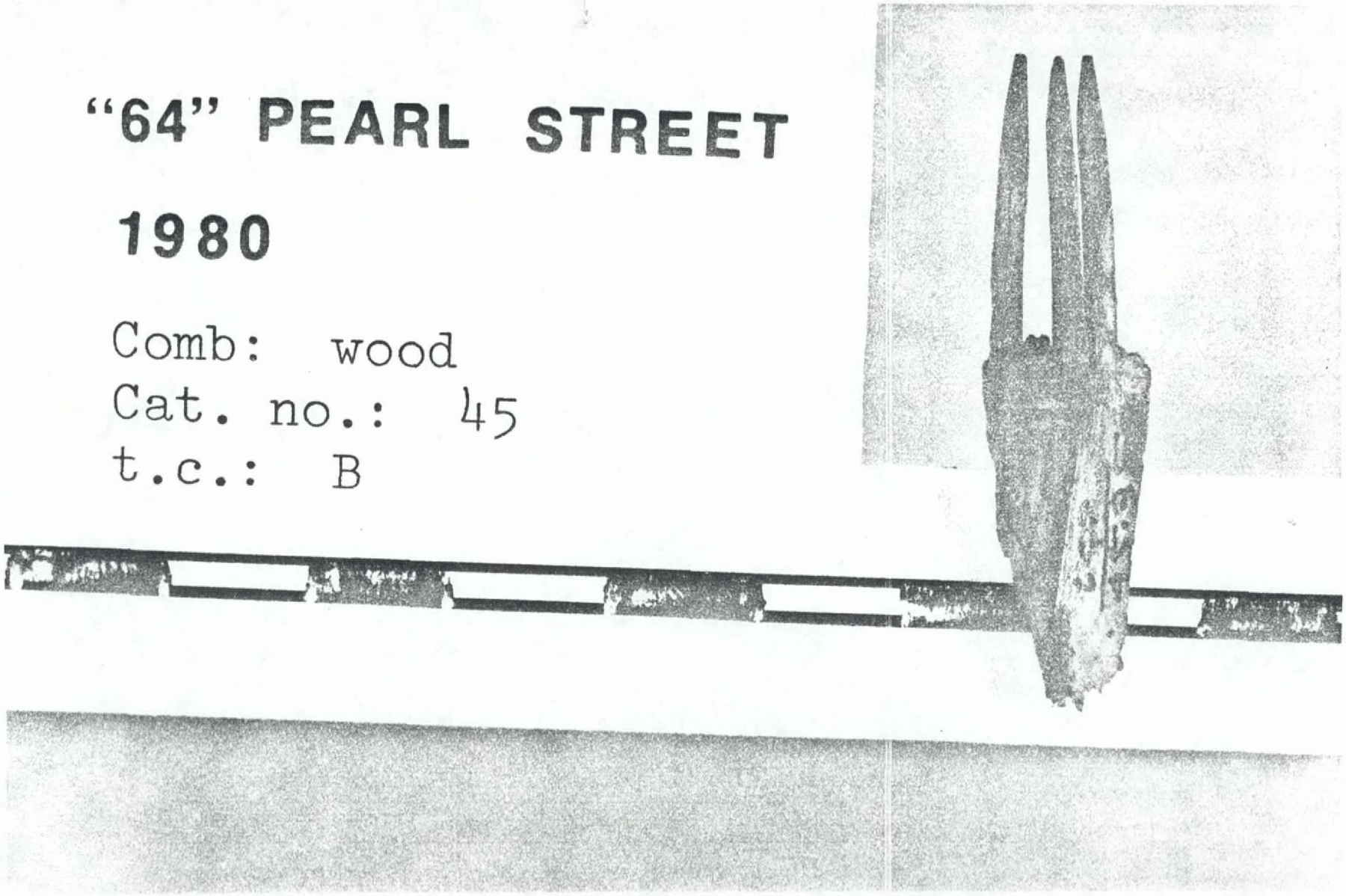


WOODEN HEAD, CAT. 45

"64" PEARL STREET

1980

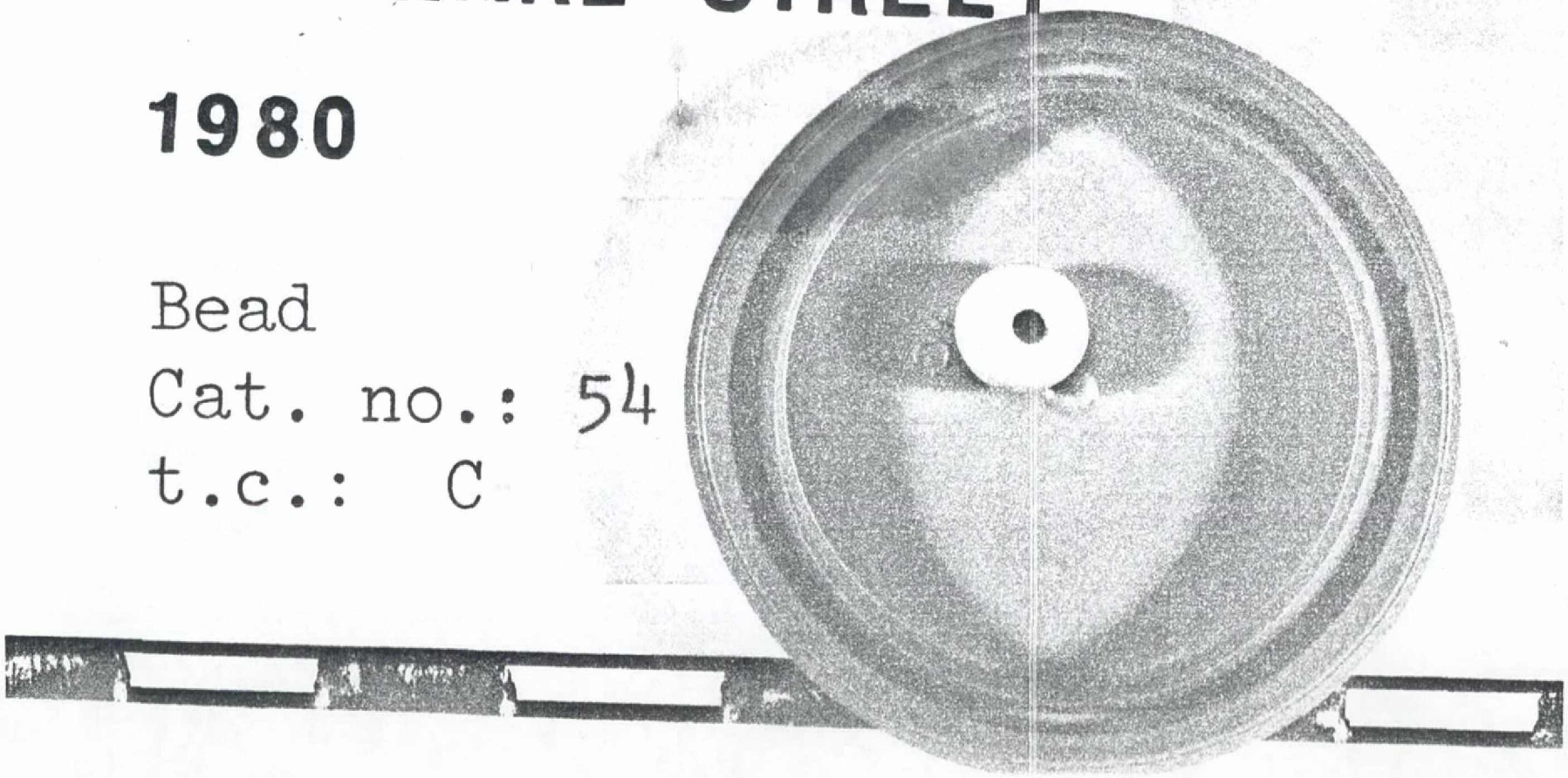
Comb: wood
Cat. no.: 45
t.c.: B

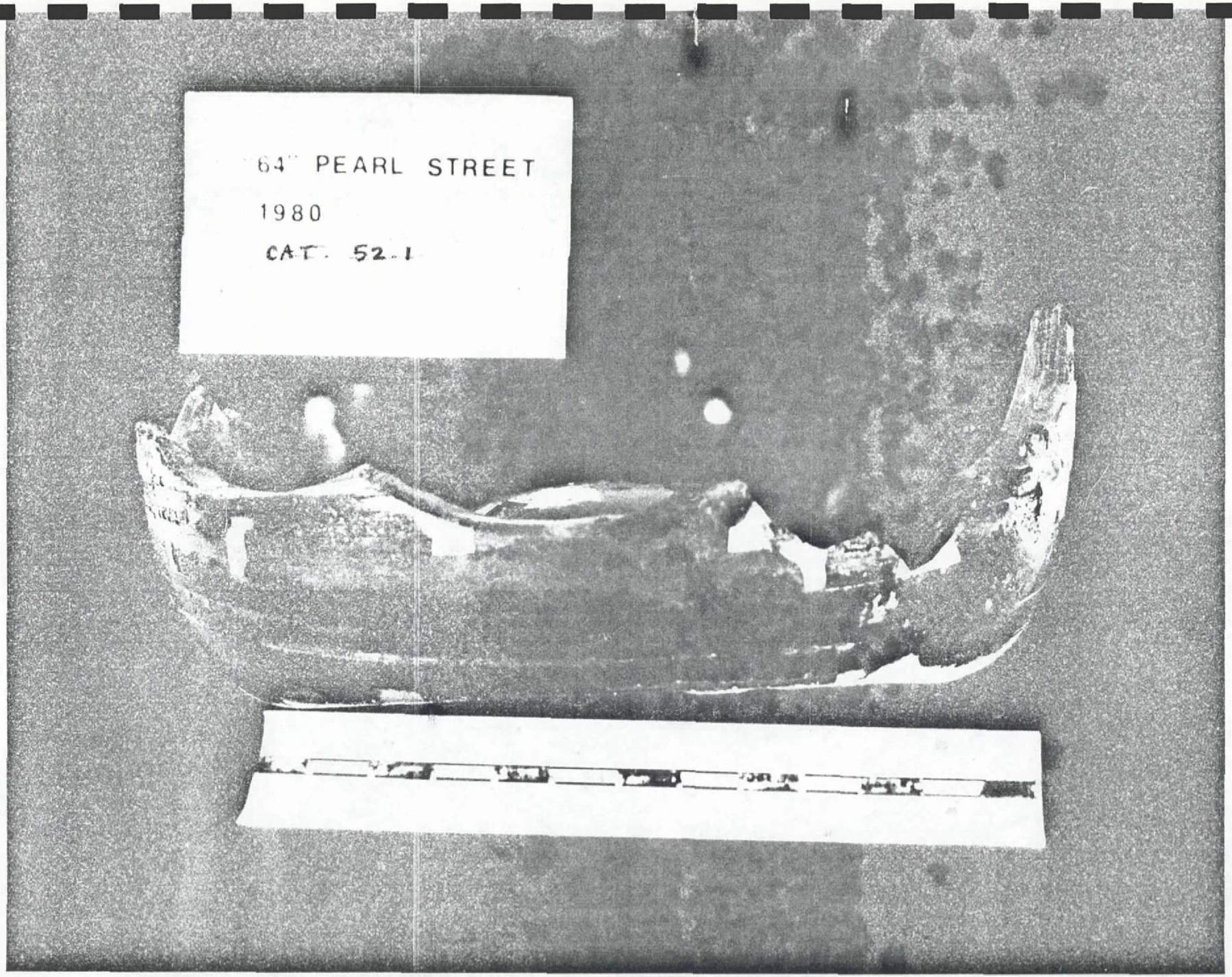


"64" PEARL STREET

1980

Bead
Cat. no.: 54
t.c.: C




64 PEARL STREET
1980
CAT. 52.1

"64" PEARL STREET

1980

Nail: iron
Cat. no.: 42
t.c.: B

Musketball: lead
Cat. no.: 45
t.c.: B