ARCHEOLOGICAL COLLECTIONS MANAGEMENT OF

The GREAT ISLAND TAVERN SITE

CAPE COD NATIONAL SEASHORE
MASSACHUSETTS

ACMP Series No. 3

Division of Cultural Resources
North Atlantic Regional Office
National Park Service
U.S. Department of the Interior

Cover illustration is a composite map of the Great Island Tavern Site constructed by the ACMP. It appears in the text as Figure 2.

Symbol on cover is a drawing of a wheel-engraved decoration on a late eighteenth or early nineteenth glass drinking vessel recovered from the Narbonne house excavations in Salem National Historic Site, Salem, Massachusetts. This drawing appears as Figure 4-71 in Moran et al. (1982:140).

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...collections represent a valuable resource only if they are properly documented, conserved, and organized in such a manner that their research value is maintained...To maintain their research value, both collections and their associated documentation must be accessible, and they must be protected from deterioration...Without a doubt, there is a crisis in curation

-Marquardt, Montet-White, and Scholtz
Resolving the Crisis in Archaeological Collections Management. American Antiquity 47:409-418. (1982)

CONTENTS

FIGURES

TABLES

PREFACE

The purpose of this manuscript is to describe the procedures used by the Archeological Collections Management Project (hereafter abbreviated ACMP) to process, conserve, and curate the artifacts from four historic sites located on Great Island, in the town of Wellfleet, Massachusetts (Figure 1). Great Island is part of the Cape Cod National Seashore (hereafter abbreviated CACO) of the National Park Service (hereafter abbreviated NPS). The focus of this project is on the Great Island Tavern site (hereafter abbreviated GIT) because of it's research significance to historical archeologists and because of the paucity of data and information for the other three sites.

This document provides CACO personnel with critical information for efficient and effective management of the collections. Equally important, it indicates to archeological researchers the kinds of quantitative data available. Problems and bias inherent in the data also are identified and discussed in detail.

This project is the third in a series of ACMP's being conducted by the Division of Cultural Resources, North Atlantic Regional Office of the NPS under the supervision of Alan Synenki. Artifact processing and conservation extended from November 15, 1982 to July 1, 1983 at the Division of Cultural Resource's Eastern Archeological Field Laboratory located in Building #28, Charlestown Navy Yard, in Charlestown, Massachusetts. The artifact processing was performed by Kerry Horn-Clingen, Linda Zaleski-Daley, Donna Gagnon, and Suzanne Spano under the supervision of Sheila Charles. Dori Partsch, CACO curator, and Susan Pshyic, a Lexington high school senior work study student also performed various processing tasks. The artifact conservation was performed primarily by Sheila Charles and Kerry Horn-Clingen in consultation with Ed McManus and Janet Stone, conservators in the Division of Cultural Resources. Kerry also is responsible for the production of the manuscript's cover design. Donna Gagnon constructed Figure 2 and wrote the ACMP Methods of Map Construction section of Chapter 2. Charles was responsible for writing Chapters 4 and 5. Chapters 2 and 3 was a collaborative effort by the authors. Synenki is responsible for Chapter 1 and served as the overall editor for the manuscript.

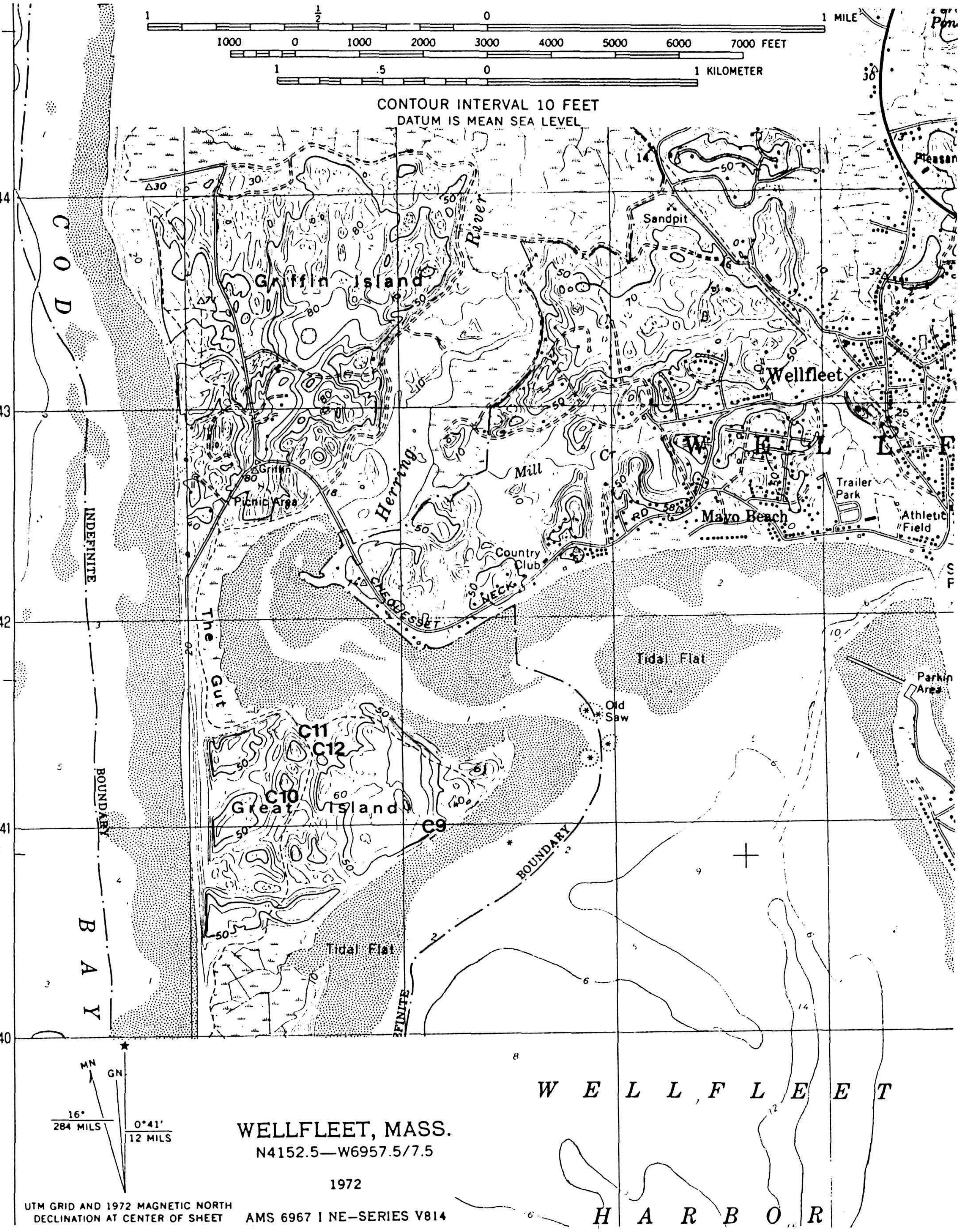

Figure 1. U.S.G.S. Map, Wellfleet Topographical Quadrangle.

ACKNOWLEDGEMENTS

Like most archeological endeavors, collections management projects are a truly cooperative effort. Without the time, enthusiasm, encouragement, and support of many, the results of this project would have been less satisfactory. Naturally, the authors accept full responsibility for any analytical or interpretive errors.

Frank McManamon, Chief, Division of Cultural Resources, National Park Service deserves special thanks for initiating this project and providing us with the opportunity to participate. Frank was responsible for initially gathering most of the written and graphic sources on the GIT.

Plimoth Plantation is especially thanked for their cooperation. Director of Exhibits Peter Cook and Photographer Ted Avery generously have given their time and were responsive to our questions and needs on several occasions. Special thanks goes to Ted for helping search through the Plantation's files for missing GIT records and providing us with copies of the GIT excavation photographs.

Erik Ekholm and James Deetz are also especially thanked for their time, support, and encouragement. Erik spent several long hours both in person and over the telephone answering our many questions. His patience is commended since we often asked for clarification and elaboration of issues as they unfolded.

Otis Dyer of Rehoboth, Massachusetts generously provided copies of various eighteenth and nineteenth century documents pertaining to the towns of outer Cape Cod. Because many of the original documents for the Cape were destroyed in the 1827 Barnstable County Courthouse fire, these documents take on special meaning.

Other historical archeologists who answered questions and provided helpful suggestions include: Mary Beaudry, Joanne Bowen, Katie Bragdon, Marley Brown, Paul Chase, John Cotter, Cathy Martin, Nan Rothschild, Pat Rubertone, and Anne Yentsch.

Last but not least, a number of individuals from the Eastern Archeological Field Laboratory and the Division of Cultural Resources deserve our gratitude. Thanks go to Chris Borstel for his suggestion of putting the site map on the cover of for his suggestion of putting the site map on the cover of the manuscript. Steve Butler is thanked for producing Figure 2 and making several last minute map changes. Thanks also go to Deborah Doyle who typed various aspects of the manuscript, provided assistance in production details and logged many hours of shuttling versions of the manuscript from the EAFL to 15 State Street. Dianne Moore also deserves a special thanks for typing numerous draft and final copies. Her perserverance with our seemingly endless changes is commendable.

CHAPTER 1

INTRODUCTION

Over the past several decades archeological collections have grown in number and size at academic, government, and museum repositories for a variety of reasons (Cantwell and Rothschild 1981:580; Marquardt et al. 1982:410; McGimsey and Davis 1977: 8-15; Thomas 1981:576). At many repositories inadequate care and curation has accompanied this growth (Christenson 1979:162; Ford 1977; Lindsey et. al. 1980) thereby rendering collections inaccessible.

In an effort to correct this, archeologists, curators and conservators recently have intensified their efforts to develop guidelines or standards to account for and better manage their existing archeological collections. While these efforts have varied in focus (Bandes 1984; Holland 1982; Keel 1984; Lindsey et al. 1980; Marquardt et al. 1980; National Institute for the Conservation of Cultural Property 1984) all agree that a systematic program of collections management must begin now.

Project Goal

The objective of this project is similar to recently completed Archeological Collections Management Projects in other parks in the North Atlantic region of the NPS (Synenki and Charles 1983a, 1983b) as well as elsewhere (Beaudry and George 1984; Ehrenhard 1984, personal communication). That is, the chief aim is to make the archeological collections accessible to park personnel for management and educational purposes, and to researchers for study and analysis.

As the authors have stated before:

> For (park) personnel, accessibility not only

means the ability to find a particular artifact in the collection it also means that they can inventory the types and quantities of artifacts present in a collection. Marquardt et al. (1982:412) have stressed the importance of the latter, emphasizing the need for the development of an efficient storage/retrieval system to accomplish this goal.

For researchers, accessibility not only means the ability to locate artifacts and associated documentary materials (e.g., fieldnotes, maps) from a collection in a repository, but it also means the artifact data has been quantified and is in a usable form. In addition, it means that definitions of each artifact class and/or category, as well as a detailed discussion of the classification and coding systems used are available [Synenki and Charles 1983a:1, 1983b:1].

The Collections

The focus of this collections project is on the recataloging, reorganization, and evaluation of the archeological remains excavated from the Great Island Tavern site. Several small bags of artifacts from three other historic sites located during a judgemental survey of Great Island also are dealt with and discussed within this report (Table 1.1).

The archeological field work on Great Island in 1969 and 1970 was directed by Erik Ekholm and James Deetz, research associate and staff archeologist respectively, for Plimoth Plantation at the time. Because Great Island is part of the Cape Cod National Seashore , the work was initiated and funded by the NPS under the supervision of John L. Cotter, then Regional Archeologist for the Northeast Office in Philadelphia.

The GIT site originally was found by NPS archeologists during a survey of Great Island in the late 1960's. Local tradition suggested that the site was either the remains of seventeenth century Dutch trading post or a tavern operated by a Samuel Smith (Ekholm and Deetz 1971:49). Hence the purpose of Ekholm and Deetz's archeological excavations was to determine the site's date and identify its function before unauthorized excavations further disturbed the original context of the site (Deetz 1977:33; Ekholm and Deetz 1970a:1). The archeological survey was conducted in the spring of 1970 after library research revealed that lengthy human occupation and ecological change for Great Island in particular, and the Wellfleet area in general (Erik Ekholm, 1970:1) had occurred.

TABLE 1.1

Site Designation and Description

Designation[1]	Description
C9	Late seventeenth/early eighteenth century tavern.
C10	historic site with large quantities of shell
C11	historic site with large refuse mound
C12	early twentieth century cottage or camp

[1]These designations were given to the sites by Plimoth Plantation Archeology Laboratory.

The GIT site was placed on the National Register of Historic Places in 1977 as the Samuel Smith Tavern site. This name was chosen because local folk tradition stated that this site was the remains of Samuel Smith's tavern (Ekholm and Deetz 1970a:4). Ekholm and Deetz (1971) termed the site the Wellfleet Tavern because of its location within the town of Wellfleet. Since then, the Division of Cultural Resources has decided to change the site's name to the Great Island Tavern because it identifies the site's location more specifically.

Prior Condition of Collections

The Great Island archeological collections were stored for 14 years in an unsecured, unrestricted area of the Archeology Laboratory at Plimoth Plantation. This area occupies the second floor of a building that also houses offices for various members of the museum's staff. No environmental controls (e.g., temperature, humidity) were present and much dirt and dust accumulated on unboxed artifacts. The Laboratory presently is being used to store various pamphlets and articles of the museum for sale or distribution.

At the Plantation, the artifacts were stored in three ways: (1) cardboard boxes, (2) plastic garbage bags, and (3) large wooden trays. The artifacts from all of the Great Island sites were stored together by material type (e.g., ceramics, glass, metal) and not by provenience. Approximately 95% of the GIT collection was stored in 32 1 ft. by 2 ft. cardboard boxes labelled "C-9." All artifact classes except shell were contained in these boxes. The shell was stored in four small plastic bags. A number of ceramics and pipestems were stored in large wooden trays. It is not known why these artifacts were separated from the rest of the GIT collection (Erik Ekholm, personal communication 1982).

With the exception of the shell and some faunal remains, all artifacts had been washed. Historic ceramics, tobacco pipes, glass, and bricks were individually labelled with a site and catalog number. Metals, mortar, charcoal, and some bone were placed in labelled paper bags. Other bone was labelled using colored dots and dashes. Each color corresponds to a specific site and provenience unit. The original key to this system still exists on the wall of the Plimoth Plantation Archeology Laboratory.

Ceramic vessel mending and stabilization of some fauna, prehistoric ceramics, and metal objects were performed on the GIT collection by the Plimoth Plantation Archeological Laboratory. The treated whalebone was wrapped in black and white newspaper and placed in cardboard boxes. As discussed

.n Chapters 4 and 5 this incorrect storage procedure ›robably accounts for much of the whalebone's present leteriorated state.

:he field documentation for the Great Island sites were :ound in two locations at Plimoth Plantation. Maps of the ;IT excavations were stored in the bottom drawer of the map :ase in the Archeology Laboratory. The artifact catalog (i.e., Plimoth Plantation Archeological Specimen Catalog), ırtifact bag list, and several reports were located in the cecords storage room on the first floor of the building that nouses the Archeology Laboratory.

Past and Current Interpretations of the Great Island Tavern Site

As historical archeologists seek to describe and explain changing social processes in colonial America, it is not surprising there has been increasing attention devoted to taverns. As Rockman and Rothschild (1983:2) note, taverns served as important social centers where not only eating and drinking occurred but information was exchanged and business deals were made. It is within this context that the GIT collection acquires its primary significance. Three analyses of the GIT's artifact assemblage deserve mentioning.

As noted above, Ekholm and Deetz's (1970a, 1970b, 1971) analyses focused on determining the identity and date of the site in question. Based on "great numbers of fragments of clay pipes and utensils for eating and drinking" and the large size of the structure's foundation (Deetz 1977:34), Ekholm and Deetz concluded that this site probably was the remains of a tavern (1971:49).

An occupation date range of 1690 to 1740 was arrived at through the analysis of pipestem bore diameters and the presence/absence of certain ceramics. Although pipestems with bore diameters indicating a 1710 to 1740 date predominated, the presence of "eight varieties of European ceramics" suggested an earlier beginning date for the site (Ekholm and Deetz 1971:50). The site's abandonment date primarily was derived from "the absence of a more refined white salt-glazed pottery made in the Staffordshire district of England as early as the 1730's as well as the lack of other distinctive types that were prevalent by the mid-eighteenth century" (Ekholm and Deetz 1971:50). As Deetz (1977:35) indicates, North American sites occupied after 1740 frequently have this white salt-glazed pottery present.

The major purpose of Bragdon's (1977, 1981) research was to determine if rural seventeenth and early eighteenth century tavern sites could be differentiated from domestic farmsteads on the basis of certain material items identified in both probate inventories and artifact assemblages. Because the GIT's deeds were destroyed in the Barnstable County Courthouse fire of 1827, only its artifact assemblage was used. Bragdon (1977:5) examined 126 probate inventories from Plimoth, Martha's Vineyard, Falmouth, and towns located on the outer Cape. Her expectation was that tavern owner inventories should list high frequencies of eating and drinking vessels and be "more often associated with activity assemblages including tables, chairs, platters, candlesticks, etc. than domestic inventories..." The results of her analysis confirmed this expectation (Bragdon 1977:7-16).

To determine if differences between a tavern and farmstead's artifact assemblage could be discerned, the GIT and Joseph Howland sites' assemblages were compared (Bragdon 1977:28-32). From her analyses, Bragdon (1977:51-52) concluded that the assemblages could be distinguished on the basis of differences in the frequency and percentage of different artifact classes. In particular, Bragdon (1977:52) suggests that "the high percentage of drinking vessels, the large number of pipestems, and the specialized glassware seem to be essentially diagnostic" of a tavern assemblage. To determine if the assemblage pattern difference was due to sampling error, Bragdon (1977:53-59) compared them to five additional tavern sites. Even though four of the sites were temporally and geographically different, their assemblages were more similar to the GIT's than to Joseph Howland's. Bragdon (1977:53) felt that John Earthy's tavern assemblage of Permaquid, Maine was the most similar of the five to the GIT.

Rockman and Rothschild (1983:1) used the GIT artifact assemblage, along with three other late seventeeth/early eighteenth century site assemblages, to "explore whether the function of taverns located in urban areas tended to be more specialized than those that took place in taverns in rural areas." To do this, Rockman and Rothschild (1983:3-7) first reviewed historians' accounts to define the range of activities that occurred at urban and rural taverns and then generated their expected material correlates. As a result of their review, Rockman and Rothschild (1983:7, 12) concluded that while rural taverns performed both accomodation and "meeting place" activities, urban taverns primarily served as the location where the latter activities occurred. Based on this information, they suggest that these activity differences should generate artifact assemblage differences. Specifically, they suggest that urban tavern assemblages should have a higher proportion of tobacco pipes and drinking-related items (e.g., glass and bottles) than food preparation and consumption-related items (e.g., ceramics). Rockman and Rothschild (1983:13) stress, however, that because "tavern sites could be regarded as a continuum expressing the degree of urbanization of their locales..." differences betwen the urban and rural tavern assemblages should be more a matter of degree than of kind. In particular, the GIT assemblage should represent one end of the continuum and the Lovelace tavern in lower Manhattan the other (1983:13). Rockman and Rothschild (1983:15-18) believe the results of their analyses confirm the above, although they do indicate that because of the small number of sites used, they are suggestive rather than conclusive.

Although the goal of this project was not reanalysis and reinterpretation of the GIT collection, the ACMP did make several observations worth noting. First, Binford's (1961) method of calculating a mean date for the GIT was performed. Because the GIT collection presently is missing 98.5% (Table 5.1) of the pipestems recovered from the excavations, and because the original artifact catalog (i.e., Plimoth Plantation Specimen Catalog) does not record pipestem bore diameters, this information was taken off a set of three maps depicting the spatial distribution of pipe stem bore diameters recovered during the 1969 excavations. Interestingly, a mean date of 1740 resulted from using Binford's (1961) methodology. However, the accuracy of this date is unknown since the pipestems used for this analysis represents only 23% (2115) of the total pipestems recovered from the 1969 and 1970 excavations.

Because of the small sample of pipestems a modified version (Appendix 8) of South's (1978) mean ceramic date for the GIT was calculated. A date of 1742 resulted from the calculations. While we acknowledge both the general problems (e.g., the exclusion of locally-produced and some coarse English earthenwares, incorrect manufacture date ranges) with South's (1978) methodology as well as the specific ones regarding its applicability to the GIT assemblage (e.g., large number and percentage of redwares, rate of artifact deposition), we believe the calculated date is not spurious and compliments the mean date calculated with the pipestem data. If anything, we believe our calculations overestimate the mean date for reasons noted above.

Before concluding this chapter, it needs to be noted that near the end of this project, the ACMP acquired an 1893 letter with information pertaining to the ownership of land parcels on Great Island in the eighteenth century. (Figure 2).

Note that one of the individuals mentioned is Samuel Smith, possibly the same person that local oral tradition (Ekholm and Deetz 1971:19) and some documents (Bragdon 1977:26-27) identify as an "inn holder" on the island in the early eighteenth century. While the letter _per se_ does nothing to confirm or refute the suggestion that the site in question was a tavern owned by Smith, investigation of other contemporary letters that may have appeared in the Cape Cod Item and Bee newspaper, as Smith alludes to, may provide further information to confirm the site's identity and occupants.[1]

[1]Otis Dyer of Rehoboth, Massachusetts generously fowarded the letter with a number of deeds for Eastham, Wellfleet, and Truro to the Cape Cod National Seashore after reading about the GIT and the loss of it's records in the 1827 Barnstable County Courthouse fire. These documents, including the letter, are xeroxs of his great-great grandfather Nathaniel Rich's handwritten copies of the originals.

Who owns Great Island

A short time since I saw the question in the Star who owns great Island there is in the possession of Capt Samuel Smith's heirs a deed dated 1746 in consideration of £3-10s paid to Thomas Rich by Samuel Smith several parcels of upland at Billingsgate on Great Island as may appear by several deeds one from William Freeman, Nicolas Paine, Titus Wixe, Saml Higgins, Barnabas Wixon, Jabez Walker, Joshua Cooke, & George Shaw, dated 1711. Another dated 1715 from Joseph Merrie Joseph Doane, & Joseph Merrick Jr, Another dated 1712 from John Knowles, Another from William Walker all to Samuel Smith to have and to hold &c &c.

Wellfleet
April 29th 1893 Mrs Smith

Figure 2. 1893 Smith Letter

CHAPTER 2

METHODOLOGY

The purpose of this chapter is to describe the procedures used by the ACMP to process and reorganize the Great Island archeological collections. In this chapter we discuss: (1) available sources on the archeology of Great Island, (2) the excavation method and original provenience system used at the GIT site, (3) the ACMP provenience coding system, (4) ACMP site map construction procedures and techniques, and (5) the processing procedures used by the ACMP to classify, record, label, and physically store the artifacts. For the most part, the chapter's organization follows the order in which the tasks were performed. Site-specific data problems are identified and discussed in Chapter 5.

Archeological Sources

Like previous ACMP's (Synenki and Charles 1983a,1983b), prior to the artifact processing, a literature search as well as inperson and phone interviews were conducted to locate and examine all written and graphic sources on the archeology of Great Island.

A literature search took place at the following organizations/institutions: the Division of Cultural Resources of the NPS's North Atlantic Regional Office, Plimoth Plantation, and the Public Archaeology Laboratory at Brown University. Phone and in-person interviews were conducted with the project director James Deetz, field supervisor Erik Ekholm, individuals who used the GIT collection for research purposes, and NPS personnel.[2]

These efforts disclosed two preliminary site reports (Ekholm and Deetz 1970a, 1970b), several journal and popular magazine articles (Anderson 1971; Bragdon 1981; Deetz 1973; Ekholm and Deetz 1971; Rockman and Rothschild 1983), one M.A. thesis (Bragdon 1977), one graduate student paper (Pichey 1970), as well as NPS correspondence. Although fieldnotes and other field documents (e.g., stratigraphic profiles) are purported to have been completed (Erik Ekholm, personal communication 1982), to date the ACMP located only the artifact catalog (i.e., Plimoth Plantation Archeological Specimen Catalog), the artifact bag list notebook, several incomplete site excavation maps, and

[2]Ted Avery, Joanne Bowen, Katie Bragdon, Marley Brown, Paul Chase, Peter Cook, John Coffer, Cathy Martin, Dori Partsch, Nan Rothschild, Pat Rubertone, Ann Yentsch.

numerous photographs and slides.

While most of the sources provide useful information of different sorts, some are more revealing than others. For example, the Plimoth Plantation Archeological Specimen Catalog proved to be the single most significant literary source for the ACMP's purposes.

It provides a near-complete list of excavated artifacts and their recovery locations for the GIT. This information enabled the ACMP to inventory the collection and determine how many artifacts presently are missing (Chapter 5).

Despite the amount of previously unknown information that was gained from these sources, there still has been significant information loss. For example, none of the sources provide a thorough description of the excavation strategies or techniques. This loss diminishes the archeological data base and significantly jeopardizes the collection's research potential.

Excavation Methodology: Great Island Tavern Site

The GIT was excavated in the summers of 1969 and 1970 (Ekholm and Deetz 1970b:1). The survey of Great Island was conducted in the Spring of 1970.

Initial excavation began in the area of stone rubble. Additional units were excavated as a result of these initial investigations. A judgemental sampling strategy was employed in all phases of excavation (Erik Ekholm, personal communication 1982).

Both spatial and stratigraphic controls were employed to document the location of artifacts and structural remains. Spatial control was achieved with a north-south/east-west grid system consisting of 167 five-foot squares (Ekholm and Deetz 1970a:1). Three test trenches, one test hole, and several features (i.e., cultural deposits defined on the basis of soil color, texture, or artifact density) also were used to maintain spatial control (Figure 3). Appendix 2 lists by year, which units were excavated.

With the exception of features, soil color differences due to either natural or cultural processes were used to maintain stratigraphic control. Features, on the other hand, were excavated as single units with no stratigraphic controls imposed (Ekholm and Deetz 1970a:1).

Except for a portion of the sterile cellar fill, all excavated soil was sifted through 1/4 in. mesh screen (Ekholm and Deetz 1970a:2). Flotation was not done and no soil samples were taken for future use.

FIGURE 3. EXCAVATION MAP.

Artifacts were recovered from a total of 160 of the 167 grid units, nine test trenches, one test hole and three features. Because many of the 160 grid units were composed of more than one stratigraphic level, artifacts were actually recovered from 2587 proveniences. As Table 2.1 indicates, over 78,000 artifacts were recovered.

ACMP Provenience Coding System

The ACMP provenience coding system retains all of the investigators' provenience information. For the GIT, this consists of the following designations: site, excavation unit, feature, and level. This information was coded from left to right in the following format: AA-BBBBB-CCC-DDD. For sites C10, and C11, when applicable, the same kinds of information were recorded but in the format: AAA-BBBB-CCC-DDD.

Appendix 1 provides a summary of the excavators' provenience descriptions and the ACMP's codes for these. Note that in many instances different excavators used different descriptors for identical stratigraphic levels. For example, the cultural level was described as a dark layer, a black layer and a refuse-charged layer. To resolve this inconsistency, the ACMP assigned a single level code to these. This was accomplished by studying excavation photographs and talking to the field supervisor (Erik Ekholm, personal communication 1982). Also note that many excavation units were excavated as single units (e.g., surface--sterile, surface--orange, surface--yellow sand, surface--). In some instances this was done because there was no cultural level visible in the soil profiles of the excavation unit. In other instances the individual excavator felt that artifacts from all levels could be combined because the GIT was assumed to be a single component site (Erik Ekholm, personal communication 1982).

Lastly, note that the ACMP coded some artifacts as "no provenience" and others as "unprovenienced". The former refers to catalogued artifacts while the latter refers to uncatalogued artifacts whose recovery locations within the GIT is unknown.

Artifact Processing and Storage

At the onset of the ACMP, artifacts, maps, and photos were removed from Plimoth Plantation to the Division of Cultural Resources' Eastern Archeological Field Laboratory for processing and reorganization.

As noted in Chapter 1, with the exception of the uncatalogued bone and shell, the artifacts from the GIT were cleaned, labelled and catalogued by the Plimoth Plantation Archeology Laboratory. The ACMP therefore dry-brushed the

TABLE 2.1

Artifact Counts and Weights by Site[1]

Artifact Class	C9	C10	C11
Historic Ceramics	29,966	14	-
Prehistoric Ceramics	52	-	-
Tobacco Pipes	9,400	10	-
Glass	11,976	1	-
Metal	9,336	8	-
Bricks	1,286	1	1
Mortar	2,874	-	-
Charcoal	135	(.68 g)	-
Bone	8,547	18	-
Lithics	518	8	-
Shell	uncataloged	(20.19 g)	-
Other	46	-	-
Total	74,134	60	1

1 C9 artifact counts are original counts taken from the Plimoth Plantation Archeological Specimen Catalog. If present counts of uncataloged artifacts are included, the total is 78,388.

C10 and C11 artifact counts and weights are present ACMP calculations because no original catalog exists for these sites.

bone, shell, and some of the more heavily-corroded metal artifacts.

Since all of the artifacts were grouped by material type, the initial step was to reorganize the collections first by site, and then by provenience within the GIT site. The latter was accomplished by matching the specimen number inscribed on the artifact with that found in the Plimoth Plantation Archeological Specimen Catalog (Appendix 3). Next, each provenience unit's artifacts were sorted into the appropriate class and category as defined by the ACMP (Table 3.1). At this point, we removed the existing emulsion from the treated whale bone and initiated our own conservation methods (Chapter 4).

With the exception of shell and fuel and fire byproducts which were weighed to the nearest gram, artifacts were counted and recorded in the appropriate row and column on the ACMP's artifact catalog (Appendix 4). Then they were stored in bags in acid-free boxes.

Artifacts were bagged according to the order of the ACMP artifact catalog. Each artifact category represented in the collection has its own bag and label. Artifacts from each provenience unit were put into 12 by 12 in. resealable, clear bags. Polyetheline bags were used because of their durability and because they permit visual inspection without the bag being opened. Acid-free tissue paper also was used to wrap some of the large whalebone pieces.

Mended ceramic and glass fragments were bagged according to a different procedure than that described above. For example, if a specimen consisted of two ceramic fragments from different provenience units the specimen was bagged according to the provenience with the lowest Plimoth Plantation Archeological Specimen Catalog number. If a specimen consisted of two or more fragments, the specimen was bagged according to the provenience with the most fragments.

All artifacts were boxed in one of three ways. Fragmentary, inorganic artifacts (e.g., ceramic sherds, tobacco pipes, etc.) were boxed together. To use storage space efficiently, artifacts from several provenience units were boxed together. When artifacts from one provenience unit were too numerous to fit into one box, several were used.

Complete or near-complete vessels recorded on the item-based catalogs (Appendices 5 and 6) were boxed separately from the fragmentary artifacts. These artifacts were arranged according to vessel number within boxes to facilitate retreival.

Organic materials (e.g., fauna, floral, fuel and fire by-products) were boxed separately from inorganic materials in order to avoid damage to the latter, to allow curators to store inorganic and organic materials in separate environments if necessary, or to facilitate access to certain materials (e.g., bone) while avoiding unnecessary handling of others.

Hollinger boxes were numbered from one to 90 and labelled with the following information: box number, site name, provenience(s), and material (i.e., organic or inorganic remains, bone treated with PVA, pulverized whalebone). The box labels were generated on the Hewlett-Packard 9845C mini-computer with the list management software package. They are replacable if damaged.

The Great Island archeological collections and associated documents are stored at the Salt Pond Visitor Center, Cape Cod National Seashore, Eastham, Massachusetts. A copy of the ACMP's artifact catalog is also available at the EAFL.

Original Maps

The purposes of this section are to discuss the criteria used to evaluate the original graphic sources and to identify the problems with them.

As noted above, several GIT site maps were located during the literature search at Plimoth Plantation. Close examination revealed that they were incomplete, inaccurate, and in a state of rapid deterioration. Because of these problems, the ACMP constructed a map (Figure 3) intended to serve as both a long-lasting reference guide and as an accurate source of the site's spatial relationships. The major intent of the ACMP's map was to preserve the integrity of the original data.

Source Material Evaluation

The original site maps were evaluated by the ACMP according to six criteria (Table 2.2). When inaccuracy or incompleteness was detected, original site documentation (e.g., photographs, reports, artifact catalog descriptions) was consulted and compared to the maps. Three groups of original maps exist: (1) 1969 excavation maps, (2) 1970 excavation maps, and (3) 1969-70 composite excavation maps.

1969 Field Season Map. This map exists in both original and reduced form. The latter appears in Ekholm and Deetz (1970a). The baseline and grid coordinates are identified on the map, but it is not indicated whether the orientation

TABLE 2.2

Map Evaluation Criteria

Criteria	Definition
Completeness	Information regarding excavation boundaries and features; presence of a key, scale compass direction, date of map, and draftsperson.
Accuracy	Correct scale, compass direction, and location of all excavated area as evidenced by the accompanying artifacts and documents.
Accessibility of Data	How easily information can be extracted.
Readability	Legibility, representation of the subject matter with distinct, consistent, clearly defined symbols.
Physical Condition of Map	Present or anticipated physical condition of the map with regard to the readability, reproduction, or accuracy.
Reproducibility	Can the map be reproduced without loss of information.

of the north arrow is magnetic or true north. Also depicted are excavation boundaries, unlabelled features, and the locations of artifacts recovered in and around the two cellar holes. All symbols used are distinct, consistent and clearly defined. A scale indicating "1 inch = 5 feet" without an accompanying linear scale, is accurate for the original source document. However, because the map in Ekholm and Deetz (1970a) was reduced for publication, the scale of the map in their report is actually 1 in. = 10 ft. This discrepancy is not mentioned in the report and therefore is a potential source of confusion.

The original map is tattered and worn and will not survive excessive future handling. It is unknown whether the dimensions represented by the map are exact field measures or just rough, subjective sketches. Neither the name(s) of the draftsperson(s) nor the date of creation is indicated on the map. A second hand-sketched map with the same information as that on the 1969 map's also exists. No additional site data is provided nor does the existing data conflict with the final version's.

A set of three maps depicting the spatial distribution of pipe stem bore diameter measurments across the site also exists. These were drawn by Erik Ekholm with the assistance of an undergraduate at Brown University for a class paper (Erik Ekholm, personal communication 1982). The three maps differ only in their symbols for bore diameters and soil layers.

1970 Field Season Maps. Five maps depicting the locations of the 1970 excavations exist. No accompanying narrative describing the excavations or the mapping techniques has been located. It is believed that some of the 1969 map construction techniques were employed in 1970 since the same labelling system was used in both sets of documents.

The most comprehensive 1970 excavation map is one comprised of twelve sheets of 11 by 17 in. graph paper. Each sheet shows the location of artifacts recovered in the vicinity of the cellar holes. These sheets are dated from 5/17/70 to 6/20/70. Although there is no map key, the symbols used to depict artifacts are identical to those used on the 1969 map. The name of the draftsperson is not indicated. The scale is also absent, but since the dimensions of the excavation units is known (Ekholm and Deetz, 1970a) the scale is probably 1 in. = 1 ft. Present ground surface depressions and artifacts are depicted and appear to be correct in their dimensions, orientations and spatial locations. Like the 1969 maps, soil layers and artifacts not found in the vicinity of the cellar holes have been excluded. Numbers appear in the corners of each excavation unit and in the center of the artifact symbols' depressions. These numbers may represent elevations.

Excavation photographs (dated June 22, 1970), illustrate three artifact clusters and three feature areas that are not shown on the 1970 site map. These areas include: (1) rock clusters south of the footings and east of Feature 3, (2) rock clusters north of Feature 7, (3) brick fall and rock clusters between Features 2 and 7, (4) a depression labelled "Feature 6", (5) complete definition of Feature 7, and (6) a depression within Feature 7 labelled, "Feature 8." The excavation units these areas are located within are either missing from the 1970 site map, labelled "unexcavated," or exhibit only a portion of a cluster or feature area. Sections of the updated versions of this map are probably missing.

The remaining 1970 field season maps are incomplete and therefore of limited utility. One map displays a series of excavation units marked "mapped," "unexcavated," "no feature" or "control." Only grid coordinate information is provided. The grid units labelled "mapped" are identical to those depicted on the large map. Another map portraying the southern portion of the site identifies the "mapped" units with scribbled lines.

An updated, untitled sheet of paper depicting six excavation units is illustrated in more detail than the 1970 site map.

One profile map, dated "6/20/70," illustrates the soil type and composition of the excavation units. Unfortunately, this information does not match the descriptions in Ekholm and Deetz (1970a, 1970b) or the map illustrating the spatial distribution of pipe stem bore diameter measurements. The grid coordinates are labelled and a scale is included. Although the symbols used to represent artifacts are not defined, they are consistent with those used on other maps. Stratigraphic measurements are not provided.

Another map depicting the northwestern portion of the site has unlabelled numbers in the corners of each grid unit. These numbers match those previously mentioned in the 1970 site map. The word "no" appears in the unexcavated units and a "///" symbol indicates excavated units. Two datum points are identified. This map is probably a portion of a much larger map that records grid unit elevations.

1969-70 Composite Map. A composite site map with the information illustrated on both the 1969 and 1970 field maps exists. Although this map may have been intended to serve as a final record of the completed site excavations, the ACMP has identified a number of problems with it.

First, the map is difficult read. Besides having no legend the spatial locations of individual features are difficult to pinpoint because the map is yellowed and torn, and the map print has bled and faded. The six areas missing from the 1970 site map are also absent from this composite map. Eight features and their grid locations are listed in the bag list notebook dated 1970. The map depicts the locations of Features 1, 3, 4 and 5. Features 1 and 2 are not labelled.

The second problem with this map concerns the locations and dimensions of the exploratory test trenches. On the map, the south test trench is located at S8 to S13, and W91/2. Yet the bag list notebook records their location at S8 to S13 and W7 1/2. Interestingly, a 5 by 5 ft. excavation unit at S8W7 was excavated on 6/16/70 and is illustrated on the map. This limited evidence seems to support the location of the south test trench as shown on the map.

The east trench is depicted on the map as three 5 by 2.5 ft. test areas. However, Erik Ekholm (personal communication 1982) has stated that all exploratory trenches were 10 by 2.5 ft. in order to maintain comparable volume measurements for the pipe stem distributional studies. The grid coordinates listed in the bag list notebook for the east test trench are E1 to E6, and S1/2. For these units the composite map is incorrect. Each unit should extend not 5 but 10 ft. east.

The north test trench consisted of both 5 by 5 ft. and 10 by 25 ft. excavation units. Photographs of the trench confirm the location and dimensions of the maps.

<u>ACMP Methods of Map Construction</u>

Given the problems of incompleteness, inaccuracy and deterioration, the ACMP constructed a new map (Figure 3). The following methodology was used.

First, the original 1969 site map was traced with black india ink on 100% rag vellum tracing paper. Each artifact and feature was precisely traced. Next, the large 1970 map was used to plot the artifacts and depressions. This necessitated reducing map items from a scale of 1 in. = 1 ft. to 1 in. = 5 ft.

Site excavation photographs were the primary source used to locate and plot features not illustrated on the 1969 and 1970 maps. These are illusrated on the ACMP map with broken black lines. The following methodology was used to locate and plot features.

First, using the known dimensions of the excavation units, a scale was established for each photo. Second, if present, grid string lines were traced for the excavation units. Third, angles and distances were measured from the excavation unit sidewalls and/or grid strings to establish their locations. Fourth, measurements of an item or area were taken to establish dimensions. Fifth, all measurements were converted to the scale of the ACMP map and drawn as broken lines.

The south and north test trenches were traced from the composite site map. The dimensions of the east test trench, however, were changed for the reasons presented above.

To visually differentiate units excavated in 1969 from 1970, the method developed and used by the Black Mesa Archaeological Project (e.g., Plog 1977) was employed. That is, two different Pantone tints were used on a clear acetate overlay. The components of the base map are visible beneath the tints, and the overlay is removable.

Reproduction of the map for this report required reduction of the 20 by 35 in. map to its present size. A large foldout size was chosen to retain detail. The Pantone tints were reproduced as gray shades through which the black-colored components of the site were discernable (Figure 3).

CHAPTER 3

CATALOG SYSTEM

The purpose of this section is to discuss the specific factors that influenced the choice of the artifact categories and to provide definitions for these.

Design

The structure of the ACMP's Great Island catalog system was designed to facilitate both efficient data entry and easy retrieval of artifact data (e.g., counts, provenience information, storage location).

The data for each site was computerized using the Query/45 program of the Data Base Management software package of the Hewlett-Packard 9845B minicomputer. Computerization not only permits quick and easy data retrieval for management purposes but also allows inter-site artifact comparisons to be made among other historic sites within the North Atlantic Region of the NPS. All collections' data are stored on flexible disks. Information concerning access to and use of the computerized data should be directed to the Division of Cultural Resources of the North Atlantic Regional Office.

Format

As noted in Chapter 2, a provenience-based catalog (Appendix 4) was used to record the total number of artifacts within particular categories according to the unit from which they were excavated.

To facilitate computerization of the provenience-based catalog, categories were arranged according to twelve artifact classes (Table 3.1). The provenience-based catalog was developed and designed for archeological researchers who prefer their data quantified by provenience and for NPS personnel who must regularly inventory their collections.

However, note that the far-right column on the provenience-based catalog allows catalogers to indicate the presence of whole or reconstructed vessels and/or significant attributes of particular artifacts. Additional information on vessels recorded in this column appears in two item-based catalogs; one is used to record reconstructed earthenware vessels (Appendix 5), the other whole bottles (Appendix 6).

Although the item-based catalogs can assist Park personnel in the selection of vessels for display and other

TABLE 3.1

Artifact Catalog Summary

Artifact Class	Category
Historic Ceramics	
redware	plain, lead-glazed one surface lead-glazed two surfaces, sgraffito, trailed slipware
tin-enameled	delft
coarse buff-bodied earthenware	combed, dotted, North Devon, gravel-tempered, mottled, other
stoneware	nottingham, other English brown, bellarmine/frenchen westerwald/raeren
white salt-glazed stoneware	plain, other
other stonware	other utilitarian import, other
Prehistoric Ceramics	
grit-tempered	exterior-corded only, undecorated
shell-tempered	decoration not discernable, undecorated
mixed-tempered	decoration not discernable, exterior-corded only, punctate, undecorated
Tobacco Pipes	
clay pipes-historic	white
Glass	
bottle glass	automatic machine made, indeterminate
drinking vessels	indeterminate
Bottle Closures	glass, metal

TABLE 3.1 (continued)

Artifact Class	Category
Apparel	
clothing	textiles
buttons	one piece cast, two piece cast, other
buckles	buckles
Household and Personal Objects	tableware, furniture and hardware, decorative objects, toiletries, coins/tokens/medals, personal objects, indeterminate
Architectural Material	
window glass	crown/cylinder
nails	handwrought, indeterminate
structural material	staples
other fastening devices	other builders' hardware, window hardware, door hardware, other, indeterminate
Tools and Hardware	domestic animal gear, weaponry/accoutrements indeterminate
Fuel and Fire Byproducts	coal, charcoal
Faunal and Floral Remains	
bivalves	Mercenaria mercenaria, Crassostrea virginica, Mya arenaria, Ensis directus, Argopecten irradians, Spisula solidissima
univalves	Nassariua obsoletus, Polinices duplicatus, Urosal pinx cinera, other

TABLE 3.1 (continued)

Artifact Class	Category
	gastropods, indeterminate univalve
indeterminate shell	indeterminate shell
other organic	other organic
bone	fish, whale, human, mammal, bird, other, indeterminate
vegetal material	seeds/nuts, other vegetal material
Lithics	
gunflints	rounded heel, indeterminate
chipped stone	quartz, quartzite, weathered felsite, red/purple felsite, other felsite, fine-grained felsite, chert, other fine-grained.

interpretive purposes, the reconstructed earthenware vessel catalog primarily was developed to maintain the integrity of Bragdon's (1977,1981) reconstructed redware assemblage. Information recorded in this catalog includes ceramic type, vessel form, number of fragments, the original provenience designation and catalog number, and the ACMP coding.

Ceramic type refers to the categories in Table 3.1. Table 3.2 indicates the range of vessel forms represented in the collection. These forms are associated with food and beverage preparation, comsumption and storage. In general, differences between the ACMP's and Bragdon's vessel forms reflect different vessel typologies. (See Beaudry et al. 1983: 18-39 for a thorough discussion on this). The ACMP's vessel typology primarily was derived from Noel Hume (1976), Watkins (1950), and Ramsay (1939). The number of fragments and proveniences comprising each vessel is included in the catalog for future researchers.

Only two glass vessels were recorded in the whole bottle catalog. The vessel number, form, contents, manufacturing process, date, additional comments, and the ACMP provenience for each vessel was recorded in this catalog.

Form refers to the function or contents of a vessel (e.g., cylindrical beverage bottle). Manufacturing process refers to one of three technological processes as defined by Lorraine (1968), McKearin and McKearin (1941, 1950), McKearin and Wilson (1978), Munsey (1970), Newman (1970), Switzer (1974), and Toulouse (1967): (1) freeblown, (2) blown-molded, and (3) automatic bottle machine. The two vessels recorded in this catalog were produced by the third process. Date ranges were assigned to the glass vessels on the basis of morphological characteristics. The above references were used to assign date ranges. Attributes such as neck finish and embossed legends were recorded in the comments section of the whole bottle catalog.

Artifact Categories:Basic Considerations

Before discussing the factors that influenced the choice of the individual artifact categories, several matters need to be noted. First, it is recognized that historic archeologists have differences of opinion about different artifact categories and classifictory schemes. This is understandable since classification systems are not real but merely constructs to help the researcher answer particular research questions (Hill and Evans 1972). This is not to deny that an understanding of historic ceramic terms is possible or to ignore the value and utility of the documentary record in ways that Deetz (1977) has suggested. Yet one can not assume that the only or best classificatory system is the one that uses manufacturers' and distributors'

TABLE 3.2

Earthenware Vessel Forms

Form	ACMP Examples	Bragdon Examples
Flatware	plate, milk pan, pudding pan, flatware	plate, plate/pan cream pan, patty pan
Holloware Bowl,Cups	bowl, cup, mug, porringer	bowl, cup, mug, mug/ beaker, beaker, posset pot
Pots,Jugs	jug, lard pot	pitcher, lard pot butter pot
Holloware	holloware	
Indeterminate	indeterminate	

ceramic terms (Miller 1980). Indeed, when classificatory schemes are constructed for specific research problems, detailed attribute analysis (Binford 1965; e.g., Braun 1977; Plog 1977) has proved to be more useful than traditional classificatory schemes (i.e., types, wares, varieties). Nevertheless, because the primary goal of this project was to render the collection accessible and because time, money and personnel were real constraints, it was not feasible nor desirable to develop a detailed attribute-based classificatory system. One potential research avenue for the GIT data may be to develop and test this type of system or the utility of other systems developed by historic archeologists (e.g., Miller 1980).

Given this, several factors were considered important in the choice of artifact classes and categories. First, artifact class and categories that historic archeologists presently are in agreement with were chosen. This is particularly true for the ceramic categories. Second, artifact categories consistent with those used in past ACMP's (e.g., Salem National Historic Site, Morristown National Historical Park) were chosen to facilitate inter-park comparisons. Lastly, in order to deal with objects similar in material and function, yet few in number, summary catagories were created.

Definitions

In general, the artifact categories are discussed in the order in which they appear in the artifact catalog (Appendix 4). Not every category is discussed because some are self-explanatory; others were not recovered at any of the Great Island archeological sites. For convenience, Table 3.1 summarizes the artifact catalog by artifact class and category.

Some artifact categories receive more thorough treatment than others because of their presumed temporal or functional significance to the GIT site. Whenever possible, individual artifacts are classified according to (1) raw material type (e.g., earthenware, stoneware, iron, brass), (2) method of production (e.g., rounded heel vs. rectangular heel gunflints) and (3) function (e.g., architectural).

Historic Ceramics

Historic ceramic sherds and vessels used in the preparation, storage, cooking, and serving of food were recorded in the first section of the artifact catalog. Although less frequently encountered, flowerpots and ceramic toiletry items (e.g., chamberpots) also were classified here. Nineteen categories were used to record the Great Island ceramics. Each category was defined on the basis of one of three pastes: (1) earthenware, (2) porcelain, or (3) stoneware. No porcelain exists in the Great Island collections.

In addition to paste, the ceramic categories are distinguishable on the basis of temper, glaze, and decoration. An attempt to determine the manufacturing location, temporal placement, and historic significance of the ceramic categories was made. The attributes used and histories discussed often were derived from and consistent with those detailed by historic archeologists (Noel Hume 1976; South 1978) and ceramic specialists (Godden 1975; Lewis 1969; Ramsay 1939; Watkins 1950, 1959).

Historic ceramics also were classified according to one of four attributes of form: (1) body/undiagnostic, (2) rims, (3) bases, and (4) handles. Complete ceramic vessels were classified as rims so that minimum vessel numbers could be calculated.

I. Earthenware

Earthenware has a relatively soft, water-absorbent paste in comparison with stoneware and porcelain (Deetz 1977:47). To make vessels impermeable, the earthenware surface is often glazed. While lead glaze was commonly used, various compounds were added to the lead to produce a range of different colors. Ceramics from eleven earthenware categories exist in the Great Island collections. These can be broken down into three earthenware varieties: (1) redware, (2) tin-enameled ware, and (3) coarse buff-bodied earthenware.

Redware

A red earthenware paste is the only attribute used to define redware ceramics. Five redware categories are represented in the Great Island collections: (1) plain, (2) lead-glazed, one surface, (3) lead-glazed, two surfaces, (4) sgraffito, and (5) trailed slipware. The GIT redware assemblage is composed of late seventeenth and early eighteenth century vessels produced locally and in England. It is by far the largest of all the GIT assemblages.

plain redware. This ware has an unglazed, coarse, red earthenware paste and surface appearance. The GIT assemblage predominately consists of plain redware ceramics. Redware vessels commonly found on post-1745 sites (e.g. Iberian storage jars) don't exist in the collection.

lead-glazed, one surface. These ceramics display two attributes: (1) a coarse red earthenware paste, and (2) a lead glaze on one surface, usually the vessel's interior. The predominant glaze colors are black and brown, although yellow and green also exist. The latter colors result from the addition of oxidized copper filings to the glaze. Green glaze seldom appears on an entire vessel because copper filings were expensive and difficult to obtain. Interestingly, one whole green-glazed vessel exists in the GIT collection. In addition, two infrequently found redware ceramic vessels, a gravel-tempered vessel with a thick crazed, dull black glaze, and a thick-bodied vessel with a sand or salt-mixed paste in the lead glaze also exist in the collection.

lead-glazed, two surfaces. These ceramics display two attributes: (1) a coarse red earthenware paste, and (2) a lead glaze on a vessel's interior and exterior surfaces.

Glazed redware handles were classified in this category even though in some instances they may be from one surface lead-glazed vessels. The predominant glaze colors are the same as those described above.

sgraffito. Three attributes define this ware: (1) a red earthenware paste, (2) a white slip that has been scratched or cut away to expose the red paste, and (3) a clear lead glaze. The combination of paste, slip, and glaze produces a rich yellow surface color with light brown body ornamentation.

Sgraffito was produced during the seventeenth and into the mid-eighteenth century. It was exported primarily from the Devon potteries (Lewis 1969:24). Woodhouse (1974:155) suggests that the sgraffito decorative process seems to have been invented in Italy during the fifteenth century. Sgraffito is not as abundant as the other redware categories in the GIT assemblage.

trailed slipware. This ware has three attributes: (1) a course, red earthenware paste, (2) the presence of a thin, trailed white slip decoration, and (3) a clear lead glaze.

Godden (1975:17) suggests that slip decorating represents "an early standard form of embellishing" on American and English redware as early as ca. 1670 and as late as 1795. Ekholm and Deetz (1970a:4) indicate that Arnold Mountfort, of the City Museum, Stroke-on-Trent, in Staffordshire, England suggests that the GIT trailed slipwares date between 1690 and 1740. Their quantity, relatively good condition, and stylistic diversity make this category one of the more significant components of the GIT ceramic assemblage.

Tin-Enameled Wares

Tin-enameled wares exhibit the following attributes: (1) a soft earthenware paste and (2) a thick lead glaze containing a tin oxide (Barber 1906). Delft is the only tin-enameled ware in the Great Island collection.

delft. This ware has a soft buff to pink colored paste, often so porous that it can be scratched easily with a fingernail. In cross section, the walls of delft sherds are relatively thick and the enamel appears to sit on the surface rather than blend into the paste. This enamel is often pitted and easily flaked off the body. The overall appearance of a glazed delft surface is opaque, often dull looking.

Known since the sixteenth century A.D, the technique of tin enameling arrived in England ca. 1597 when Jaspries Andries and Jacob Janson of the Netherlands established the first factory in Norfolk (Noel Hume 1976:203; Lewis 1969:35; Solon 1906). Western European production of delft, said to be the major English ceramic development of the seventeenth century (Noel Hume 1976:106), continued into the nineteenth century when white salt-glazed stonewares and creamwares supplanted the tin-enameled market. Delft from England rather than Holland (Moore 1908) most likely predominates in the GIT collection due to restrictions from the late seventeenth to mid-eighteenth century (Noel Hume 1976:107). Delft glaze colors range from white to light blue in the GIT collection.

Course Buff-bodied Earthenware

These wares exhibit a course buff earthenware paste. Five categories of seventeenth and eighteenth century buff-bodied earthenwares exist in the Great Island collections: (1) combed, (2) dotted, (3) North Devon gravel-tempered, (4) mottled, and (5) other course buff-bodied earthenware.

combed ware. Three attributes define this ware: (1) a relatively hard, course, buff to pink earthenware paste, (2) a slip decoration consisting of repetitive thin, wavy brown lines, and (3) a smooth, often glossy yellow surface color due to the application of a lead glaze. Undecorated fragments of combed and/or dotted sherds also are recorded in this category.

The technique of combing involves drawing a thin wire, horn, leather comb, or similar object with brown slip on it over the vessel's surface (Woodhouse 1974:157; Godden 1975:17). South (1978: 72) and Noel Hume (1976: 135) suggest that combed and dotted wares were produced in England initially at Staffordshire and then at Bristol and Wrotham ca. 1670-1795. Some production of this ware may have occurred in New England beginning in the second half of the seventeenth century (Noel Hume 1976:134).

dotted ware. Except for slip decoration, dotted wares exhibit the same attributes as combed wares. Slip decoration on dotted wares exhibit circular, often raised brown dots on a vessel's surface. Dotted wares are less common than combed wares in the GIT collection.

North Devon gravel-tempered ware. Two attributes define North Devon gravel-tempered wares: (1) a pink paste with a gray colored sand and gravel temper,and (2) often a light brown to apple green lead glaze.

This ware was produced between 1650 and 1775 and "exported to America in large quantities during the eighteenth century"(Noel Hume 1976:133). Vessel forms are restricted to crude utilitarian forms (e.g., such as milk pans, jugs, and small storage jars). Watkins (1978:13) states that "it seemed impossible that such crude pottery should ever have been shipped across the ocean...." However, because the North Devon towns of Barnstable and Bideford where the pottery was made were foremost ports in the seventeenth century, North Devon wares were popular exports. The decline of the production and closing of the North Devon ports occurred ca. 1760 as a result of the English war with France (Watkins 1978:15).

mottled ware. Two attributes define this ware: (1) a buff to brown earthenware paste and (2) a mottled brown lead glaze with lustrous streaks due to the addition of manganese. The common vessel form of this early eighteenth century Staffordshire earthenware is the mug.

other coarse buff-bodied earthenware. Ceramics recorded in this category exhibit a fairly thick, coarse buff earthenware paste. This category includes (1) unidentifiable, burnt or fragmented coarse buff-bodied earthenwares with or without a glaze and (2) other usual or distinctive coarse buff-bodied earthenwares. One example of the latter is a vessel (V-65) that possesses a buff earthenware paste covered with a red slip. The slip has been scratched or cut away in areas to expose the buff paste and then coated with a clear lead glaze. This combination of paste, slip, and glaze produces a red vessel surface color with white body ornamentation (i.e., reverse sgraffito).

II. Stoneware

Stonewares are highly fired ceramics with a hard, vitreous, nonabsorbent paste. Webster (1971:40) notes that unlike the red earthenwares, stoneware is fired at a temperature of approximately 2300 degrees F. The color and surface texture of stoneware varies as a result of different clay properties, kiln firing conditions, and the kind and amount of glaze applied to the vessel (Stewart and Cosentino 1977:21). Eight imported stoneware categories are present in the GIT assemblage: (1) nottingham, (2) other English brown, (3) bellarmine/frenchen, (4) westerwald/raeren, (5) plain white salt-glazed, (6) other white salt-glazed, (7) other utilitarian import, and (8) other stoneware.

nottingham. This ware is defined on the basis of two attributes: (1) a thin, dense, hard, gray stoneware paste, and (2) a smooth lusterous orange to brown salt-glazed surface. This specific type of English brown stoneware was first produced in the late seventeenth century by James Morely of Nottingham, England (Lewis 1969:55; Noel Hume 1976:114). Production continued until ca. 1810. Mugs are the most common vessel form and incised hands often decorate their exterior surface. Nottingham stonewares made in Burslem, Staffordshire, Derbyshire, and Swinton differ from those made in Nottingham. The latter appears to exhibit a thin white slip that separates the glaze from the paste while the former do not (Noel Hume 1976:114). The Nottingham stonewares in the GIT assemblage appear to be of the latter type.

other English brown stoneware. This ware is identified on the basis of two attributes: (1) a thin, dense, hard, gray stoneware paste, and (2) a fine, often mottled, brown salt-glazed surface. These attributes characterize a variety of English stonewares produced in the late seventeenth through eighteenth century in Burslem, Staffordshire, Derbyshire, and Swinton (Noel Hume 1976:114). John Dwight of Fulham is attributed with perfecting this English ceramic variety which is based on Rhenish stoneware (Noel Hume 1976:112). Mugs are a common vessel form.

bellarine/frenchen. These stonewares exhibit (1) a thick gray stoneware paste, and (2) a light to golden brown, mottled salt-glazed exterior surface. The most common vessel form is bottles and jugs. Often they exhibit one of three types of ornamental relief designs: (1) medallions, (2) pseudo-armorial devices, and (3) a bearded human face inaccurately labelled a caricature of Cardinal Roberto Bellarmino (Noel Hume 1976:55-57). Rhinish stonewares were manufactured in and around the first quarter of the eighteenth century.

westerwald/raeren. Two attributes identify these ceramics: (1) a gray stoneware paste and (2) an elaborate stamped, incised, and/or spring-molded surface decoration with cobalt blue and/or manganese purple glaze. The first of these gray and blue stonewares exhibit ornamental friezes and were produced ca. 1590 in Raeren, Germany (Noel Hume 1976:280).

The Westerwald decorative style, on the other hand, consists of "elaborate floral and geometric designs" such as thin spring molding and combed lines (Noel Hume 1976:280). Manganese purple which appears to have been introduced "as early as the 1660s...did not become common until the last quarter of the century" (Noel Hume 1976:280). The cobalt blue geometric and floral designs appeared more frequently and throughout the westerwald production era. Although the popularity of westerwald/raeren waned in the 1760's in England and America, production continued until 1775 (Noel Hume 1976:283). Common vessel forms include mugs and jugs.

White Salt-Glazed Stoneware

The specific attributes used to identify white salt-glazed stoneware are (1) a thin, fine-grained white stoneware paste, and (2) a white salt-glazed surface.

Dipped white salt-glazed stoneware, identified by a thicker, fine-grained gray stoneware paste coated with a white salt-glazed slip, was classified in this category.

The production of white salt-glazed stonewares in a "plethora of factories from Devonshire to London, and London to Glascow" occurred between 1720 and 1805 (Noel Hume 1978:27; Mountford 1971, 1973). Because of the absence of white salt-glazed stonewares in the GIT assemblage Ekholm and Deetz 1971:50 suggest that the site was no longer occupied by 1750.

Many ceramic historians contend that dipped white salt-glazed stoneware is the earliest of the white salt-glazed stonewares (Noel Hume 1976:115). Whether speaking of dipped or solid, Noel Hume (1976b:16) suggests that white salt-glazed stoneware was one of the eighteenth century's most significant ceramic advances "not only because it marked the advent of a new body, but because it brought along with it a new design capability that was subsequently reflected in other wares." While popular, "this ware was competitive in price to pewter and superior to the wood and earthenwares traditionally used in English and Colonial households" (Moran et al. 1982:116). The rising popularity of creamware, however, forced the decline in production ca. 1775 (Mountford 1973:214).

plain white salt-glazed stoneware. Ceramics classified as this ware are undecorated and exhibit no molded edges or other surface decoration.

other white salt-glazed stoneware. This ware is defined by the presence of a decoration other than molding or scratch blue (e.g., hand painting or scratch brown). In the GIT assemblage, items classified as other white salt-glazed stoneware have rims or edges coated with a band of brown iron-oxide slip. Noel Hume (1976:114-115) suggests this slip was applied to prevent the body from being exposed during firing.

other utilitarian imported stoneware. Three attributes are used to identify this stoneware: (1) a hard, nonabsorbent, vitreous stoneware paste, (2) a salt-glazed exterior, and (3) the absence of an Albany slip interior wash.

other stoneware. Ceramics in this category include unidentifiable stoneware sherds that cannot be classified into a specific stoneware category.

Prehistoric Ceramics

The prehistoric ceramic classifictory system used by the ACMP is the one developed for the Cape Cod National Seashore Archeological Survey (Childs 1982a, 1982b). In this system, prehistoric ceramic categories are distinguished on the basis of paste, temper, and decoration. If more than one type of surface decoration appears on a single specimen, it was classified under the most recurrent one.

Prehistoric ceramic categories were divided into three groups on the basis of temper: (1) grit-tempered, (2) shell-tempered, and (3) mixed tempered (Childs 1982b:1). In addition to temper, prehistoric ceramics also were divided into one of three groups on the basis of form: (1) body/undiagnostic, (2) rims, and (3) bases.

Grit-Tempered

These ceramics consist of granite, quartz, and sand grit temper.

exterior-corded only. These grit-tempered prehistoric ceramics possess a cord-marked exterior surface. This kind of surface treatment results from the use of a cord-rapped paddle that is impresed against the vessel's body (Childs 1982a:1-2).

undecorated. Grit-tempered prehistoric ceramics classified as undecorated exhibit no decorative surface treatment.

Shell-Tempered

The temper of these ceramics have the presence or evidence of shell. Ceramics that exhibit sand in a primarily shell-tempered body also are classified here. These particles represent either natural inclusions in the clay or are purposely added to the shell temper to prevent sticking (Childs 1982a:3). Scallop, quahog, and softshell clam are the common shell species used as temper in the GIT assemblage. Ceramics whose shell have disintegrated or been leached out were also classified here. Evidence of this disintegration consists of thin cavities, often oriented parallel to the sherd surfaces (Childs 1982b:6).

decoration not discernible. The decoration of these ceramics can not be identified.

undecorated. These ceramics do not exhibit any decorative surface treatment.

Mixed-Temper

The temper of these ceramics contain both grit and shell. Although mixed temper ceramics do not occur frequently on Cape Cod sites (Childs 1982b:7), they predominate the GIT's prehistoric ceramic assemblage.

Decoration not discernible. Mixed-tempered sherds are those whose decoration cannot be identified.

Exterior corded only. These ceramics possess only a cord marked exterior surface. Three sherds, probably representing a single vessel, exist in the GIT collection. This vessel dates to the Early Woodland period (Childs, personal communication 1983).

punctate. These ceramics exhibit rounded depressions in a vessel's exterior surface (Childs 1982:1).

undecorated. These ceramics do not exhibit any decorative surface treatment.

Tobacco Pipes

Only historic white ball clay tobacco pipes exist in the GIT assemblage. Pipe stems were recorded separately from pipe bowls. Pipe fragments composed of both stem and bowl were recorded in the pipebowl category. Pipestem bore diameters were measured with the shank end of drill bits ranging from 9/64 in to 4/64 in in diameter.

Glass

This section of the artifact catalog was used to record bottle glass and glass drinking vessels.

Bottle Glass

Whole or bottle fragments were classified on the basis of the three general manufacturing techniques: (1) freeblown,

Architectural Material

This section records construction hardware and building materials. Five categories of architectural material appear in the GIT collection: (1) window glass, (2) nails, (3) structural material, (4) other fastening devices, and (5) other hardware. Each category is self-explanatory and requires no further elaboration here.

Crown and cylinder window glass, associated lead mullions or came, handwrought and indeterminate nails, crudely made bricks and interior wall plaster are the most common artifacts found in the GIT architectural assemblage.

Tools and Hardware

Three categories of tools and hardware exist in the GIT collection: (1) domestic animal gear, (2) weaponry and accoutrements, and (3) other tools and hardware. Items in these categories also were classified into one of fifteen material type groups.

Fuel and Fire Byproducts

This functional class includes five categories of fuel or fire byproducts: (1) coal, (2) charcoal, (3) ash/cinders/clinkers, (4) wood, and (5) slag. Only coal and charcoal are present in the GIT collection. Metric weights were taken for these items.

Lithics

This section records unworked stones and minerals, worked prehistoric and historic lithics, and soil and carbon-14 samples. Only the gunflint and chipped stone categories are represented in the GIT assemblage.

Gunflints

Gunflints were classified into three morphological categories: (1) rounded heel, (2) rectangular heel, and (3) indeterminate. No rectangular-heeled gunflints exist in the GIT assemblage.

Chipped Stone

The prehistoric lithic classificatory system used by the ACMP is the one developed for the Cape Cod National Seashore Archeological Survey (Borstel 1982a, 1982b).

Chipped stone was classified according to one of the following eight raw material types: (1) quartz, (2) quartzite, (3) weathered felsite, (4) red/purple felsite, (5) other felsite, (6) fine-grained felsite, (7) chert, and

(2) blown in mold, (3) automatic bottle machine. An indeterminate category for glass fragments that lack pontil scars, hand tooled-necks, or mold marks to identify their method of manufacture was also used. Although most of the GIT bottle glass assemblage was classified as indeterminate, much of it is probably composed of freeblown wine bottles and vials from the early eighteenth century.

Bottle glass also was classified according to one of three attributes of form: (1) body/undiagnostic, (2) necks, and (3) bases. In contrast to whole ceramic vessels, whole bottles were recorded as bases because this attribute is used often to calculate whole vessel counts.

Drinking Vessels

Whole and fragmentary drinking vessels were classified according to the techniques described above. Although most fragments of the GIT's were classified as indeterminate they probably are composed of mostly freeblown wineglasses from the early eighteenth century.

Glass drinking vessels were classified according to four attributes of form: (1) body/undiagnostic fragments, (2) rims, (3) bases/stems, and (4) handle fragments.

Bottle Closures

This section of the catalog records bottle stopper types. Bottle closure fragments excavated from the GIT consist of both glass and metal closures.

Apparel

This section records apparel and associated fastening devices. The twelve categories in this section are divided into three groups: (1) apparel, (2) buttons, and (3) buckles and other fasteners. Each category is self explanatory and therefore needs no elaboration here.

Household and Personal Objects

This section records household objects employed in the maintenance and decoration of a house, personal possessions associated with grooming, writing, procurement of goods, ornamentation, and play. The artifacts in these categories were classified into one of seventeen raw material groups.

The GIT collection contains artifacts identified as tableware, furniture, hardware, decorative objects, toiletries, coins/tokens/medals, and personal objects. These artifacts are composed of different materials including metals(i.e., ferrous, copper, brass, lead, silver, pewter, other metals), glass, bone, shell, and wood.

(8) other fine-grained, and one of the following nine technological functional groups: (1) core, (2) shatter/block, (3) trim flake, (4) thinning flake, (5) decortification flake, (6) flake, (7) uniface, (8) point, and (9) biface.

Faunal Remains

The aim of the faunal classifictory system is to identify and tabulate basic faunal frequency data. The initial step in cataloging the fauna involved distinguishing between invertebrate and vertebrate animal remains. There are seventeen invertebrate categories, seven vertebrate categories, and one "other organic" category. Invertebrates are seperated into three broad shellfish groups: bivalves, univalves, and indeterminate shell.

Bivalves

Bivalves were classified according to one of nine categories based on species differentiation. Although it is recognized that the relationship of shell weight to body size is not straightforward and weight is not identical for all individuals of a species (Synenki and Charles 1983:29), shell weights rather than counts were calculated because there is reason to believe that the former can be used to estimate shellfish net weights. In addition, right and left halves of bivalve species were counted to provide future researchers with data needed to estimate the minimum number of individuals present.

Except for *Ensis directus*, the definitions for these attributes were defined by Gagnon (Synenki and Charles 1983a:29-30). Gosner (1979), Jacobson and Emerson (1971), Morris (1973), and Sabelli (1979) were consulted for taxonomic identifications, habitat, and general descriptions of the various species.

Mercenaria mercenaria. This species of hard shell clam is defined on the basis of four attributes: (1) a thick, solid, well-inflated shell with numerous closely-spaced concentric lines; (2) the hinge portions are elevated and placed forward; (3) teeth occur along the shell edge; and (4) a dull gray exterior with a white interior frequently with a dark violet border.

Crassostrea virginica. Three attributes define oysters: (1) thick, robust shell; (2) narrow, elongated shell gradually widening and moderately curved; and (3) grayish-white exterior and white interior.

Mya arenaria. Soft shell clams are identified on the basis of four attributes: (1) a thin, roughly oval-shaped shell with concentric growth lines; (2) chondrophore projects from left valve; (3) no teeth on shell edge; and (4) chalky white exterior.

Ensis directus. The diagnostic attributes used to identify the common razor clam are (1) a thin, narrow shell about six times longer than wide; (2) bowed hinge line; (3) two teeth on the left hinge; and (4) beaks at the front end.

Argopectea irradians. The diagnostic attributes used to identify scallop are (1) roughly round, well-inflated shell with a flat hinge flaring outward; (2) the exterior is covered by 17 to 20 wide , rounded , radiating ribs; and (3) the upper valve is grayish brown and the lower valve is white.

Univalves

Univalves were separated into seven categories.

Nassarius obsoletus. The mud dog whelk is identified by four attributes: (1) a weakly sculptured shell, (2) an open umbiblicus, (3) an oval aperture, (4) a columella with a fold and (5) specimens are rarely over 1 in in length. Mud dog whelks are scavengers attracted to dead fish bait.

Polinices duplicatus. The lobed moon shell, also called Sharkeye, is identified by two characteristics: (1) the round aperture of the shell, and (2) mature specimens are commonly 2 to 3 in. in diameter.

Urosalpinx cinera. Three attributes are used to identify the common oyster drill: (1) a well sculptured shell, (2) an open, flaring anterior canal and (3) the specimens are rarely over 1 in. in length.

Other gastropods. This category includes other identifiable univalve species less frequently encountered.

Indeterminate univalves. This category was used to classify shellfish remains identifiable as univalves yet indeterminate with respect to species.

Indeterminate shell
Shell fragments devoid of attributes which would enable them to be more specifically classified as univalves or bivalves were catalogued as indeterminate.

Vertebrates

There are seven categories of vertebrate animal bone. Four are major zoological class distinctions: (1) fish, (2) mammal, (3) bird, and (4) other (i.e., reptile and amphibian). Two categories are more specific mammalian species: (1) whale and (2) human. The final category of bone is indeterminate and was used to record bone fragments that lack attributes which allowed their placement into a specific category.

In addition to sorting and counting bone into these categories, diagnostic bone was identified, counted and bagged separately. Diagnostic bone is defined here as those which exhibit articular surfaces (e.g., distal or proximal ends), or intentional sculpturing (Olsen 1971:18). Diagnostic bone will allow researchers to determine species, age, sex, size, diet, and/or habits(e.g., migratory activities). In addition, diagnostic bone also reflects the prior condition of the individual(e.g.,disease, malformation), the cause and season killed, and/or the butchery techniques.

Although it is recognized that certain research questions require bone weights rather than counts (Chaplin 1971:67), the latter was chosen because it enables faunal specialists to estimate the time and effort required for a more complete analysis (Bowen 1982; Eckles 1982; Jones 1982, personal communication). In addition, counts allow the calculation of species percentages in the collection (Bowen 1978:152).

It should be noted that the original catalogers did not catalog undiagnostic bone measuring under 1/4 in. The ACMP decided not to catalog this bone because of time constraints. Although this bone was retained along with the larger fragments of bone from the same provenience, it was bagged separately and labelled, "Uncatalogued bone < 1/4 in."

Other Organic Remains

This catagory was used to record coprolites, coral, eggshell fragments, as well as other organic remains.

Floral Remains

Three categories were used to catalog floral remains: (1) seeds/nuts, (2) other comestibles, and (3) other vegetal material.

Seeds/nuts. Only peach pits and other large specimens exist in the GIT assemblage.

Other vegetal material. This category includes plant roots and wood fragments exhibiting no evidence of human modification.

CHAPTER 4

Artifact Conservation

The purpose of this chapter is to present the materials conservation plan developed and implemented for the GIT archeological collection. The following aspects of artifact conservation are discussed: (1) prior treatment and condition of the artifacts, (2) ACMP conservation plan, (3) conservation experiments on faunal material, (4) treatment of faunal material, and (5) results and problems of artifact conservation. In addition, recommendations for the future care of the collection are made.

Prior Treatment and Present Condition

Two primary conservation methods were performed on the GIT artifacts by the Plimoth Plantation Archeological Laboratory: (1) ceramic vessel mending, and (2) stabilization of fauna, prehistoric ceramics, and historic metal artifacts. Both treatments involved the use of an emulsion consisting of polyvinyl acetate resin (hereafter abbreviated PVA) and acetone (Erik Ekholm, personal communication 1982, Kathy Martin, personal communication 1983). The emulsion was made by combining PVA crystals with a gallon of acetone until the consistency was so viscous that additional PVA would not stay in solution.

Vessels were mended by brushing the emulsion on the broken surfaces of the fragments. Light pressure then was applied until they bonded together. Visual inspection of the mended ceramics indicates that both slippage and breakage has occurred since application of the emulsion. Because of these problems, it is recommended that archeologists consult conservators when using PVA to mend ceramic vessels (Janet Stone, personal communication 1984).

For artifact stabilization, the emulsion was thinned with acetone and then brushed onto the artifact's surface. After this dried, a second application of full strength emulsion was brushed onto the artifact's surface to "drive in" the diluted solution and coat the specimen's surface. Once this second application dried, the artifact was wiped with acetone so that it would not have a glossy "treated" appearance.

Visual inspection of the whalebone indicates that the emulsion did not penetrate beyond the specimen's surface. Many of the large pieces' inner structures were, in fact, badly deteriorated. Exfoliation of the whalebone also has occurred on a number of these pieces. This probably was the result of the rigid outer surface acting against the soft powdery inner structure.

Breakage and deterioration of the whale bone in particular and faunal remains in general also resulted from improper storage of them. For example, newspaper was used to pack the whalebone. This had a detrimental effect on the faunal material because newsprint is extremely acidic (Singley 1981:38).

The magnitude of loss due to inadequate stabilization measures and improper storage of the faunal remains can only be estimated. Comparison of the present bone fragment frequencies with those recorded on the original artifact catalog revealed that approximately 444 bone fragments or 5.2% of the total catalogued bone is missing. Although some of this may be due to actual loss, much of it was probably due to the stabilization measures and storage conditions used. For example, over 3358.7 kg of pulverized bone (i.e., bone which passed through a 1/4 in. mesh screen) was removed from the original boxes in which they were stored.

ACMP Conservation Plan

Based on the above observations, the objective of the ACMP plan was to choose a stabilization technique that would prevent further deterioration of the GIT collection without permanently altering the specimens or causing loss of important characteristics (Chaplin 1971). Because of time and monetary constraints, however, the ACMP treated only the diagnostic whalebone since it was deteriorating rapidly.

Experiments

Since the nature of the deterioration and condition of the specimen will dictate the proper stabilization methodology, experiments were performed to test for (1) the presence of chlorides, (2) the presence of PVA and the effects of its removal, and (3) post-treatment bone resiliency using different PVA concentrations and immersion time lengths. Table 4.1 summarizes the results of these experiments.

To document the condition of the specimen before and after the experiments, an artifact treatment form (Appendix 7) was used. These records are stored with the Great Island archeological collections.

The significance of documenting conservation experiments cannot be overemphasized (Johnson and Horgan 1979:18). It eliminates future guesswork by curators and researchers about matters such as restrictions for the objects' future handling and usage. For example, not only is chemical analysis on PVA-treated specimens precluded but they should

TABLE 4.1

Experiment Data

SPECIMEN #	TEST PURPOSE	PHASE 1 PVA GRADE	%	DURATION	PHASE 2 PVA GRADE	%	DURATION	RESULTS
1x	Effect of PVA	AYAC	5	30 min.	-	-	-	Adequate
2x	Effect of PVA	AYAC	10	45 min.	-	-	-	Adequate
3x	Effect of PVA	AYAC	2.5	60 min.	-	-	-	Fair
1xx	Effect of PVA	AYAC	10	45 min.	-	-	-	Poor
2xx	Effect of PVA	AYAC	5	45 min.	-	-	-	Poor
3xx	Effect of PVA	AYAC	2.5	45 min.	-	-	-	Poor
1	Effect of PVA	AYAC	5	60 min.	-	-	-	Poor
2	Effect of PVA	AYAC	2.5	60 min.	-	-	-	Poor
3	Effect of PVA	AYAC	2.5	1 day	-	-	-	Poor
4	Effect of PVA	AYAC	2.5	1 day	AYAF	5	1 day	Fair
5	Effect of PVA	AYAC	2.5	3 days	-	-	-	Poor
6	Effect of PVA	AYAC	2.5	3 days	AYAF	5	3 days	Adequate
7	Effect of PVA	AYAC	2.5	6 days	-	-	-	Poor
8	Effect of PVA	AYAC	2.5	6 days	AYAF	5	6 days	Adequate
9	Effect of PVA	AYAC	5	1 day	-	-	-	Poor
10	Effect of PVA	AYAC	5	1 day	AYAF	10	1 day	Adequate
11	Effect of PVA	AYAC	5	3 days	-	-	-	Poor
12	Effect of PVA	AYAC	5	3 days	AYAF	10	3 days	Superior
13	Effect of PVA	AYAC	5	6 days	-	-	-	Superior
14	Effect of PVA	AYAC	5	6 days	AYAF	10	6 days	Superior
15	Presence of Chloride	-	-	5 days	-	-	-	Negative
16	Presence/Removal of PVA	-	-	3 days	-	-	-	Fair
17	Presence of Chloride	-	-	5 days	-	-	-	Negative
18	Effect of PVA	AYAC	5	210 min.	-	-	-	Poor

Definitions:

Poor-specimen's interior and exterior surfaces are soft and powdery.
Fair-specimen's surface is strengthened, but it's interior is extremely soft.
Adequate-specimen's interior and exterior surfaces are further strengthened, but specimen is likely to fragment.
Superior-PVA has penetrated and strengthened specimen's surface and interior and exterior of the specimen. Specimen can withstand some stress.

x - Specimens collected recently from First Encounter Beach, Eastham
xx - Specimen's immersed in food coloring

not be placed in association with mothballs. This interaction may result in the dissolution of the PVA (Edward McManus, personal communication 1982).

Experiment 1

To detect traces of chlorides, the test described by Plenderleith and Werner (1971) and Semczak (1977) was used. Specimens were immersed in distilled water for five days. Subsequent to this, a ten ml sample of the water was placed in a vial with 5 drops of nitric acid and 3 drops of silver nitrate. The sample then was inverted and shaken a few times. If chloride contamination occurred, the sample would appear cloudy. Results of this test indicated that the GIT specimens were not contaminated.

Experiment 2

To confirm the presence of PVA and observe the effects of its removal, specimens were immersed in a beaker of acetone for three days. Three changes were observed which confirmed the presence of PVA: (1) the resin crystals on the specimen's surface dissolved, (2) the specimen's surface color lightened, and (3) a small weight loss after immersion occurred. This experiment also revealed that specimens whose PVA has been removed may become brittle and fragment when handled. Unless a synthetic resin or acrylic is applied, it is best not to remove the PVA.

Experiment 3

Despite the problems with Plimoth Plantation Archeological Laboratory's use of PVA, the ACMP felt that given the choice of consolidents available today, PVA could be used effectively if the proper PVA to acetone ratio and specimen immersion time could be determined.

Experiments using different molecular weight grades, ratios of PVA to acetone, and different lengths of immersion were conducted. Immersion rather than vacuum impregnation (Chaplin 1971:28, Plenderleith and Werner 1971:156) was used to insure penetration of the emulsion into the specimen because it is believed that the former produces better results if specimens are immersed for a significant amount of time (Janet Stone, personal communication).

As Table 4.1 indicates, 21 specimens underwent a PVA/acetone immersion. Fifteen of these, including three collected recently from First Encounter Beach in Eastham, were subjected to a single immersion phase. The remaining six specimens were subjected to a two immersion phase treatment.

The first phase used PVA grade AYAC. This grade of PVA resin has a low molecular weight and is moderately viscous. The second phase, initiated after the specimens dried, used PVA grade AYAF. This grade has a higher molecular weight and viscosity. Both phases used three different concentrations of PVA: 2 1/2%, 5%, and 10%. These percentages represent a weight per volume ratio expressed as grams per liter. For example, a 10% solution is 10 g of PVA crystals desolved in 100 ml of acetone. The length of time the specimens remained immersed varied between 45 minutes and six days.

The specimens were monitered closely to detect any change in the following variables: surface deterioration, surface color, specimen weight, and degree of penetration. Measurements of changes in these variables both before and after the experiments were taken.

After the specimens were removed from the emulsion they were air-dried. To test for penetration differences, specimens then were either: (1) sectioned with a diamond wafering blade on a Buehler Isomet low speed saw or (2) immersed in water with blue food color, and then sectioned. Specimens were examined macroscopically and microscopically under normal and ultraviolet light conditions for penetration differences. The more florescent the specimen appeared under long wave ultraviolet light, the greater the penetration.

The most satisfactory result was obtained from specimen #14. This specimen first was treated for six days with a 5% solution of PVA grade AYAC and acetone, and then immersed for an additional six days in a 10% solution of PVA grade AYAF and acetone. The results indicate that while the first phase produced adequate inner bone absorption, the second phase increased surface strength. Certainly, differences in the size and condition of specimens require modifications of this treatment to achieve adequate results.

Final Treatment

Based on the results of Experiment 3, a two phase immersion procedure was used. Phase 1 consisted of a 5% PVA(Grade AYAC) to acetone emulsion. Phase 2 consisted of a 10% (Grade AYAF) PVA to acetone emulsion. The immersion time was a minimum of six days (Table 4.2). Fifty-eight diagnostic whalebone fragments and one human frontal bone were treated between March 1 and June 1, 1983. While most of the fragments' recovery locations within the GIT are unknown (ACMP code C9-9999-999-999), seven were recovered from N1W4.

The ACMP conservation treatment consisted of three procedures: (1) specimen preparation, (2) PVA emulsion preparation, and (3) treatment.

TABLE 4.2

Duration of Immersion for Treated Artifacts

Number of Specimens	Days in Phase I	Days in Phase II
17	6	10-13
10	9	14-15
6	10	12-13
3	12	12-13
15	13	12-13
6	16	12

A number of precautions were taken with cracked, and heavily deteriorated specimens to avoid further breakage. First, they were wrapped with thin flower wire. Second, they were wet gradually rather than immersed abruptly. Treated bones then were placed in polyetheline bags and suspended to dry. In general, specimens responded favorably to these precautions.

Since a large quantity of emulsion was required, solution preparation time was reduced by first preparing a concentrated solution and than diluting it using Pearson's Square (Plenderleith and Werner 1971). A 20% PVA (AYAC) emulsion first was prepared and then diluted with a 10% concentration by adding one part acetone to one part of the 20% PVA (AYAC) solution.

During the immersion and drying stages of the treatment, specimens were watched and evaporation rates controlled. Storage of the treated fauna in clear, inert polyetheline bags and/or acidic free tissue and boxes did not occur until the specimens were thoroughly dry.

The emulsion was disposed of in the following manner. First it was put in polyetheline-lined metal containers. The containers then were exposed to air in a secluded, well-ventilated area outside the building. When the acetone evaporated out of the emulsion, the remaining PVA was discarded.

Results

An increase in the strength of the whalebone's inner structure and outer surface resulted from the treatment. The specimens, however, did undergo color and weight change.

Before treatment, the bone ranged in color from medium tan to brown. After treatment the bones were a lighter tan. Also, some bleaching was evident on the outer surface edges of specimens immersed for a longer period of time during the second phase of immersion.

The original weights of the treated specimens ranged from 5.67 to 2659.7 g. Forty specimens increased in weight. For example, 22 specimens experienced weight gains of zero to five g. Seven exhibited gains of six to ten g. Eleven specimens gained over ten g, six of which had a 30 to 40 g gain and two with over a 50 g gain. The causes of this variability in weight gain are not clear. Although it is suspected that pre-treatment specimen weight, fiber density, and immersion time all contributed to this variability, the amount that each contributed is not presently known.

Generally, the artifacts with intact outer surfaces responded best to the treatment. Results were less favorable with cracked specimens and those with large exposed cancellated structural areas. The lattice work of the spicules that form channels in the interior portion of the bone may have prevented uniform emulsion absorption. In addition, specimens that were previously mended and treated at Plimoth Plantation, but not sufficiently cleaned of sand and dirt, exhibited the least favorable response and experienced the greatest weight losses. The sand and dirt not only interfered with emulsion absorption, but caused deterioration. Mended artifacts tended to separate during immersion.

Future Care of the Collections

The curator of the Great Island archeological collections should perform regular visual monitoring of the collections for (1) physical, (2) chemical (e.g., active corrosion), and (3) biological (e.g., insects, mold growth) changes.

The most significant way to prevent these changes is to place the collections in a controlled environment. The ACMP has made an initial attempt in this direction by storing the artifacts in inert ployetheline bags and vented acid-free Hollinger boxes. The insertion of humidity strips to monitor relative humidity, silica gel packages to absorb moisture, and activated charcoal paper to absorb sulfur and carbonate pollutants could also be initiated if problems are detected.

Attention also should be paid to the environment of the storage facility itself. Although relative humidity and temperature levels differ for organic remains and inorganic remains (Thomson 1978:64-124), temperatures between 65 and 70 degrees fahrenheit and relative humidity levels of 50 to 55% are recommended to prevent potentially dangerous physical changes, chemical reactions, and biodeterioration. It is recommended that a hydrothermograph be used to continuously monitor the temperature and relative humidity levels in the storage area.

In regard to the treated fauna, it is recommended that this material not be put in a cabinet containing mothballs for reasons discussed above.

CHAPTER 5

DATA PROBLEMS

The purpose of this chapter is to discuss the GIT collection's data problems identified by the ACMP and discuss their probable causes so that researchers who may want to use the collection for analytical purposes can evaluate their effects.

Three primary data problems exist: (1) inconsistent, inadequate, and incomplete provenience information, (2) artifact and field document loss, and (3) artifact deterioration. These problems stem from both inadequate data collection and record-keeping strategies used in the excavation of the GIT, and inadequate curation of the artifacts.

Data Collection and Record-Keeping Strategies

Four specific data collection and record-keeping strategy problems exist: (1) inconsistent soil descriptors, (2) inadequate stratigraphic control, (3) incomplete provenience information, and (4) inconsistent artifact cataloguing.

In general, the stratigraphy of the site is not complex. Original maps, reports, and photographs of the excavations, for example, indicate that the stratigraphy of the site was composed of three natural/cultural levels: (1) a tan, wind-blown surface sand, (2) a dark, sandy cultural layer, and (3) sterile orange sand. Despite this, the Plimoth Plantation Archeological Laboratory Specimen Catalog lists no less than 42 different level descriptions.

The reason there are so many descriptions is that no standard terminology was developed nor implemented by the field supervisor; individual excavators assigned soil and level descriptions according to their own perceptions (Erik Ekholm, personal communication 1982). As noted in Chapter 2, the ACMP resolved this problem by assigning a single code to similar stratigraphic levels (Appendix 1). This was accomplished by examining excavation photographs and color slides. The ACMP's codes then were checked by the field supervisor (Erik Ekholm, personal communication 1982).

Stratigraphic controls were inadequate for many areas of the GIT. The major problem was that the cellar holes, features, and a large portion of the non-feature areas were excavated as single units (Ekholm and Deetz 1970b:2). Several of the primary implications of this problem are: (1) it is not possible to determine if the contents of features are the result of single or multiple dumping episodes, (2) primary and secondary refuse (sensu Schiffer 1972) from the cellar holes cannot be distinguished, and (3) it may not be possible to correlate stratigraphic levels among non-feature excavation units.

Incomplete provenience information exists for the location and dimensions of the test hole and the locations and extent of vandalism due to illegal excavations. It is not possible to determine if this information was recorded or not, since the kinds and amount of original field documentation missing is still unknown. This is unfortunate because it is not known if any excavation units included areas where vandalism occurred. The effect of this kind of disturbance therefore cannot be ascertained.

Two inconsistent artifact cataloguing procedures by the Plimoth Plantation Archeological Laboratory were identified by the ACMP: (1) differences in artifact terminology, and (2) differences in artifact counts. Although these inconsistencies should have no effect on the use of the data, they nevertheless need to be explicitly stated so that researchers need not spend time or effort identifying or worrying about their implications.

Different descriptions were used for similar artifact types. For example, delft was recorded as delft, tin glaze, white-glazed earthenware, white lead glaze, and earthenware paste bisque. In other instances, the same term was used to denote different artifact types (i.e., combed, mottled, and trailed slipware) or classified under the more general, albeit accurate, term of lead-glazed earthenware.

A lot and an item-based catalog system were used inconsistently. For example, some artifacts (e.g., trailed slipwares) were given individual catalog numbers while others (e.g., unglazed, undecorated redwares) were assigned one catalog number for several sherds obviously from different vessels. In other instances, the same artifact type (e.g., pipestems) was lot-catalogued for some provenience units and individually catalogued for others. As will be discussed below, these inconsistencies did not prevent the ACMP from being able to determine the amount of presently missing artifacts.

Curation

The most significant data problem is the amount of artifact loss in the 14 years they were curated at Plimoth Plantation. To determine the extent of loss, present artifact counts were compared to original counts in the

Plimoth Plantation Archeological Laboratory Specimen Catalog. During this process, the ACMP made the following notations in the catalog.

First, if the count and classification of an artifact(s) was correct, a red checkmark was made in the left-hand margin. If the actual number of artifacts did not match that of the catalog's, the difference was circled in red. If the ACMP felt an artifact(s) was classified incorrectly, the suggested classification was written in the "description" column. This procedure allows researchers, if they so desire, to observe how many artifacts are missing for each catalog number, and evaluate Plimoth Plantation's and the ACMP's artifact classification.

Tables 5.1 and 5.2 summarize loss by artifact class and for several artifact categories. Uncatalogued artifacts were not included in these tables because it was not possible to determine how much loss had occurred.

As Table 5.1 indicates, some material types exhibit significant amounts of artifact loss. For example, over 98% of the pipestems are presently missing. While only 3.6% of the historic ceramics are missing, this represents 1079 sherds. The highest percentage of historic ceramic loss is stoneware (Table 5.2).

The ACMP also calculated the proportion of artifact loss per provenience and excavation unit, and for the two cellar holes (Table 5.3) since there was some suggestion that certain areas of the GIT sustained significantly more loss than others.

Both the analysis of variance ($F=.0036; df=1,19; P<.05$ Roscoe 1975 :299) and the Kruskal-Wallis chi square approximation tests ($X^2=.0039; df=1; P<.05$ Roscoe 1975 :307) indicate that there is no statistically significant difference between the percentage of artifacts missing from the two cellar holes and the rest of the site (Table 5.4). In addition, spatial distribution of the proportion of missing artifacts for non-feature areas of the site indicates that no one area exhibits more loss than others.

There are three primary reasons that account for the discrepancies between the present and original artifact counts: (1) actual artifact loss, (2) artifact deteriaortion and breakage, and (3) cataloguing error.

By far the most significant reason for the discrepancies is artifact loss. As noted in Chapter 1, for 14 years the Great Island collections were stored in an unrestricted, unsecured area at Plimoth Plantation. The collections were made available to archeologists and other staff members at Plimoth Plantation without any formal, written record of the

Table 5.1

Percentage of Missing Artifacts from the GIT

Artifact Class	X^1	X^2	%
Historic Ceramics	29966	1079	3.6
Prehistoric Ceramics	52	0	-
Tobacco Pipes	9400	9259	98.5
Glass	11974	683	5.7
Metal	9336	3594	38.5
Bricks	1286	572	44.5
Mortar	2874	2417	84.1
Charcoal	135	16	11.9
Bone	8547	444	5.2
Lithics	518	34	6.6
Other	46	5	10.9
Total	74134	18103	24.4

X^1 frequency of artifacts cataloged in the Plimoth Plantation Archeological Laboratory Specimen Catalog.
X^2 frequency of missing artifacts.
% percentage of missing artifacts.

Table 5.2

Percentage of Missing Artifacts for Selected Artifact Categories

Artifact Category	X^1	X^2	%
Historic Ceramics			
redware	25058	777	3.1
sgraffito	407	40	9.8
trailed slipware	1015	20	2.0
delft	553	42	7.6
combed slipware	1048	50	4.8
North Devon gravel temper	54	0	0.0
mottled	855	50	5.8
glazed earthenware	266	41	15.4
English brown	125	1	.8
bellarmine	95	10	10.5
westerwald	188	7	3.7
white salt-glazed	164	10	6.1
other stoneware	138	27	19.6
Total	29966	1075	-
Glass			
window glass	9424	615	6.5
bottle glass	1922	46	2.4
drinking glass	477	10	2.1
other	248	9	3.6
Total	11974	680	-
Metal	8670	3485	40.2
nails	351	33	9.4
iron	213	69	32.4
lead kame	102	10	9.8
Total	9336	3597	-

X^1 frequency of artifacts cataloged in the Plimoth Plantation Archeological Laboratory Specimen Catalog.
X^2 frequency of missing artifacts.
% percentage of missing artifacts.

Table 5.3

Percentage of Missing Artifacts Recovered Within Cellar Holes

Artifact Type	Feature 2			Feature 7		
	X^1	X^2	%	X^1	X^2	%
Historic Ceramics	100	8	8.0	815	51	6.3
Tobacco Pipes	22	22	100.0	206	201	97.6
Glass	51	5	9.8	281	46	16.4
Metal	76	18	23.7	1483	673	45.4
Brick	24	4	16.7	44	26	59.1
Mortar	20	19	95.0	118	118	100.0
Charcoal	2	1	50.0	9	0	0.0
Bone	-	-	-	423	16	3.8
Lithics	4	1	25.0	6	1	16.7
Other	3	0	0.0	12	0	100.0
Total	302	78	25.8	3397	1132	33.3

X^1 frequency of artifacts cataloged in the Plimoth Plantation Archeological Laboratory Specimen Catalog
X^2 frequency of missing artifacts
% percentage of missing artifacts

Table 5.4

Percentage of Missing Artifacts for Two Areas of the GIT

	X^1	X^2
Historic Ceramics	4	6
Prehistoric Ceramics	0	-
Tobacco Pipes	99	98
Glass	5	15
Metal	37	44
Brick	45	44
Mortar	83	99
Charcoal	12	9
Bone	5	4
Lithics	6	20
Others	16	0

X^1 percentage of artifacts missing from all excavation units except the cellar holes
X^2 percentage of missing artifacts from the cellar holes

loan agreement (i.e., borrower, date, inventory of artifacts borrowed, condition of artifacts borrowed). While it is hoped that some of the missing artifacts will be found and returned, it is unrealistic to assume that others (e.g., English farthings) will reappear.

Artifact deterioration is the second most significant reason for discrepancies between the present and original artifact counts. This is particularly true for the whalebone, metal artifacts, and to a lesser extent, historic ceramics. Two major factors are responsible for this deterioration: ineffective stabilization procedures, and inadequate storage methods. As discussed in Chapter 4, both factors have caused significant damage to the whalebone. The improper emulsion and use of newspapers for storage of the fauna resulted in 3358.7 kg of pulverized bone.

The lack of a desiccate (e.g, silica gel) in the storage of the metal artifacts caused a large portion of them to further rust, flake, and in extreme cases completely deteriorate. This is noticeable by comparing the actual artifacts with their photographs taken over a decade ago.

A number of ceramics exhibited relatively recent breakage when the ACMP removed the collections from the Plimoth Plantation Archeology Laboratory. This breakage probably occurred because vast amounts of large and small fragments were stored together in large, open wooden trays. Abrasion, due to the constant opening and closing of these trays, as well as the frequent handling of these materials probably resulted in some breakage.

Two common cataloguing errors also account for the discrepancies between the present and original artifact counts: (1) counting error, and (2) incorrect or illegible artifact labels. One other, albeit less frequent, error was the assignment of the same catalog numbers to artifacts from two different excavation units (e.g., catalog number 9351 to 9357 to S6W4 and Test Trench A). While most of the errors were corrected by the ACMP, several could not be resolved.

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APPENDIX 1

Level and Excavation Unit Information

SITE	ACMP LEVEL CODE	ORIGINAL EXCAVATORS' LEVEL DESCRIPTIONS	EXCAVATION UNITS
C9	001	Surface--Cultural Level Surface--Meaningful Layer Surface--Dark Surface--Black Top--Black Surface--(if followed by dark level)	N1W1, N3W1, N3W6, N3W8, N5W6, N5W7, N6W2, N6W6, N6W7, N6W9, N7W1, N7W2, N7W3, N7W6, N8W2, N8W3, N8W6, N23W5. S3W2, S7W1, S7W2, S7W3, S7W4, S7W5, S8W1, S8W2, S8W3, S8W4, S8W5, S9W1, S9W2, S9W3, S9W4, S9W5, S10W1, S10W2, S10W3, S10W4, S11W1, S11W2, S11W3, S11W4, S12W1, S12W2, S12W3, S12W4, 0000-002, TTNA, TTNB, TTNC
C9	01A	White Sand--Dark	N18W5, 0000-007
C9	002	Cultural level Dark Layer--Orange Dark Layer Black Layer Refuse Charged Layer Artifact Filled Layer Artifact Layer--Sterile	N1W1, N3W1, N3W2, N5W6, N5W7, N6W2, N6W6, N6W7, N6W9, N7W1, N7W2, N7W3, N7W6, N8W2, N8W3, N8W6, N8W11, N18W5, S1W1, S7W1, S7W2, S7W3, S7W4, S7W5, S8W1, S8W5, S9W1, S9W2, S9W3, S9W4, S9W5, S10W1, S10W2, S10W3, S10W4, S11W1, S11W2, S11W3, S11W4, S12W1, S12W2, S12W3, S12W4. TTNA, TTNB, TTNC.

APPENDIX 1

Level and Excavation Unit Information

SITE	ACMP LEVEL CODE	ORIGINAL EXCAVATORS' LEVEL DESCRIPTIONS	EXCAVATION UNITS
C9	02A	General Cleanup Dark Layer Cleanup	N1W2
C9	02B	Dark Layer--Orange Cleanup Under Rocks	N1W3, N3W5, N4W5, N5W3, N5W6, N6W3, N6W7, N7W3.
C9	003	Sterile Level Orange Layer	N1W2
C9	999	All Levels Surface--Sterile Surface--Orange Surface--Yellow Sand Surface--(not followed by darker layer)	N1W2, N1W3, N1W4, N1W5, N1W6, N1W7, N1W8, N1W9, N1W10, N2W1, N2W2, N2W3, N2W4, N2W5, N2W6, N2W7, N2W8, N2W9, N2W10, N2W11, N3W3, N3W4, N3W5, N3W7, N3W9, N3W10, N3W11, N4W3, N4W4, N4W5, N4W6, N4W7, N4W12, N5W4, N5W5, N6W4, N6W5, N7W4, N7W5, N8W1, N8W4, N8W5, N8W11, N13W5, S1W1, S1W2, S1W3, S1W4, S1W5, S1W6, S1W7, S1W8, S1W9, S1W10, S2W1, S2W2, S2W5, S2W6, S2W7, S2W8, S2W9, S2W10, S2W11, S3W1, S3W5, S3W6, S3W8, S3W9, S3W10, S4W1, S4W2, S4W3, S4W4, S4W5, S4W6, S4W8, S4W9, S4W10, S5W1, S5W2, S5W3, S5W4, S5W5, S5W6, S5W7, S5W8, S5W9, S5W10, S5W11, S6W1, S6W2, S6W3, S6W4, S6W5, S6W6, S6W7, S6W8, S6W8, S6W9, S6W10, S6W11, S7W6, S7W7, S7W8,

APPENDIX 1 (continued)

Level and Excavation Unit Information

SITE	ACMP LEVEL CODE	ORIGINAL EXCAVATORS' LEVEL DESCRIPTIONS	EXCAVATION UNIT
			S7W9, S8W6, S8W7, S8W8, S9W5, TTSA, TTSB, TTSC, TTEA, TTEB, TTEC.
C9	99T	Surface--Orange (Trash) Surface--Orange through trash	N5W3
C9	0TS	Total Sample	N6W3
C9	0DF	Dark Fill at Bottom of Feature 7	S2W10-007
C9	00F	Fill	S2W10-007, 0000-008
C9	0WF	Wall Fill	S2W11-007
C9	E0W	East of Wall	S2W11

APPENDIX 1

Level And Excavation Unit Information

SITE	ACMP LEVEL CODE	ORIGINAL EXCAVATORS' LEVEL DESCRIPTIONS	EXCAVATION UNIT
C9	OCF	Clearing Footings	S3W11-007, S4W11, S5W11, S6W5, S6W6
C9	PHB	Pot Hunter's Backdirt	N3W4
C9	OCW	Outside Cellar'Wall	S3W2
C9	BRS	Bottom of Robbed Stairway	S3W10-007, S3W11-007
C9	JAF	Just Above Floor	0000-002
C9	OFL	Floor Level	0000-002, 0000-007
C9	OAF	Above Floor	0000-002
C9	OLF	Lower Fill	0000-007
C9	OML	Mixed Layer	0000-007

APPENDIX 1

Level and Excavation Unit Information

SITE	ACMP LEVEL CODE	ORIGINAL EXCAVATORS' LEVEL DESCRIPTIONS	EXCAVATION UNIT
C9	0BZ	Black Zone	00TH
C9	0CS	Clearing Stairway	0000-002
C9	000	(No level information is given. This code in conjunction with feature or other provenience description.)	N3W7-099, N5W7-004, N8W11-0PC, N8W12-ISL, S1W1, S6W4-003, S9W5-006, 0000-002, 0000-000.
C10	TP0-000	Test pit 1	
C11	0000-000	Provenience unknown	

APPENDIX 2

GIT Units Excavated by Year

1969

N1W2
N1W8
N2W10
N3W4
N3W10
N6W4
S1W3
S1W4
S1W5
S1W7
S1W8
S1W11
S2W2
S2W3
S2W4
S2W5
S2W6
S2W7
S2W8
S2W11
S3W1
S3W2
S3W3
S3W4
S3W7
S3W11
S4W2
S4W3
S4W4
S4W11
S5W2
S5W5
S5W6
S5W7
S5W8
S5W11
S6W6
S7W1
S7W2
S7W3
S7W4
S8W1
S8W2
S8W3
S8W3
S8W4
S9W1
S9W2
S9W3
S9W4
S10W1
S10W2
S10W3
S10W4
S11W1
S11W2
S11W3
S11W4
S12W1
S12W2
S12W3
S12W4
N1W1
N1W3
N1W4
N1W5
N1W6
N1W7
N1W9
N1W10
N1W11
N2W1
N2W2
N2W3
N2W4
N2W5
N2W6
N2W7
N2W8
N2W9
N2W11
N3W1
N3W2
N3W3
N3W5
N3W6
N3W7
N3W8
N3W9
N3W11
N4W3
N4W4
N4W5
N4W6
N4W6
N4W7
N4W12
N5W3
N5W4
N5W5
N5W6
N5W7
N6W2
N6W3
N6W5
N6W6
N6W7
N6W9
N7W1
N7W2
N7W3
N7W4
N7W5
N7W6
N8W1
N8W2
N8W3
N8W4
N8W5
N8W6
N8W7
N8W11
N8W12
N18W5
S1W1
S1W2
S1W6
S1W9
S1W10
S2W1
S2W9
S2W10
S3W5
S3W6
S3W8
S3W9
S3W10
S4W1
S4W5
S4W6
S4W7
S4W8
S4W9
S4W10

1970

S5W1
S5W3
S5W4
S5W9
S5W10
S6W1
S6W2
S6W3
S6W4
S6W5
S6W7
S6W8
S6W9
S6W10
S6W11
S7W5
S7W6
S7W7
S7W8
S7W9
S8W5
S8W6
S8W7
S8W8
S9W5
TTNA
TTNB
TTNC
TTEA
TTEB
TTEC
TTSA
TTSB
TTSC

APPENDIX 3

PLIMOTH PLANTATION
Box 1620
Plymouth, Mass.

ARCHAEOLOGICAL LABORATORY

Specimen Catalog: Site No:

Cat. No.	Description	Location	Date Found

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________________ Inorganic Box Numbers ______

Provenience ______________ Organic Box Numbers ______

CERAMICS: HISTORIC, Earthenware

Group	Type	BODY/UNDIAG.	RIM	BASE	HANDL	TOTAL	
REDWARE	Plain						
REDWARE	Lead Glazed, 1 surface						
REDWARE	Lead Glazed, 2 surfaces						
REDWARE	Sgraffito						
REDWARE	Trailed Slipware						
REDWARE	Jackfield						
REDWARE	Astbury						
REDWARE	Other						
TIN ENAM	Delft						
TIN ENAM	Rouen/Faience						
TIN ENAM	Other						
COARSE BUFF-BODY EARTHENWARE	Combed Wares						
COARSE BUFF-BODY EARTHENWARE	Dotted Wares						
COARSE BUFF-BODY EARTHENWARE	N. Devon Gravel Temprd.						
COARSE BUFF-BODY EARTHENWARE	Yelloware						
COARSE BUFF-BODY EARTHENWARE	Mottled						
COARSE BUFF-BODY EARTHENWARE	Other						
	Whieldon						
CREAMWARE	Plain						
CREAMWARE	Shell-Edged						
CREAMWARE	Other Edge Decorated						
CREAMWARE	Handpainted						
CREAMWARE	Annular						
CREAMWARE	Transfer Printed						
CREAMWARE	Other						

Cataloged by ______________ Date ______________

P. 1

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________________ Inorganic Box Numbers______

Provenience______________ Organic Box Numbers_______

CERAMICS: HISTORIC, Earthenware and Porcelain

		BODY/UNDIAG	RIM	BASE	HANDL	TOTAL	
PEARLWARE	Plain						
	Shell-Edged						
	Other Edge Decorated						
	Handpainted						
	Annular						
	Transfer Printed						
	Other						
WHITEWARE	Plain						
	Shell-Edged						
	Other Edge Decorated						
	Handpainted						
	Annular						
	Transfer Printed						
	Other						
OTHER EARTHENWARE	Lusterware						
	Agateware						
	Rockingham/Bennington						
	Other						
PORCELAIN	Undecorated						
	Underglz HP-monochrome						
	Underglz HP-polychrome						
	Overglz HP-monochrome						
	Overglz HP-polychrome						
	Gilted						
	Transfer Printed						
	Other						

Cataloged by______________ Date______________

P. 2

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________________ Inorganic Box Numbers______

Provenience______________ Organic Box Numbers_______

CERAMICS: HISTORIC, Stoneware

		BODY/UNDIAG	RIM	BASE	HANDL	TOTAL	
	Nottingham						
	Other English Brown						
	Bellarmine/Frechen						
	Westerwald/Raeren						
WHITE SALT GLAZED	Plain						
	Moulded						
	Scratch Blue						
	Other						
DRYBODY	"Black Basaltes"						
	"Rosso Antico"						
	Other						
	Other Utilit. Import						
	Other Domestic						
	Other						

Cataloged by____________ Date_______________

P. 3

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________ Inorganic Box Numbers ______

Provenience ____________ Organic Box Numbers ______

CERAMICS: PREHISTORIC

		BODY/UNDIAG.	RIM	BASE	TOTAL	
GRIT TEMPERED	Decor. not discernible					
	Inter/Exter. corded					
	Exterior corded only					
	Dentate stamped					
	Punctate					
	Incised					
	Undecorated					
	Punctate and Incised					

SHELL TEMPERED	Decor. not discernible					
	Inter/Exter. corded					
	Exterior corded only					
	Dentate stamped					
	Punctate					
	Incised					
	Undecorated					
	Punctate and Incised					

MIXED TEMPERED	Decor. not discernible					
	Inter/Exter. corded					
	Exterior corded only					
	Dentate stamped					
	Punctate					
	Incised					
	Undecorated					
	Punctate and Incised					

Cataloged by ____________ Date ____________

P. 4

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________ Inorganic Box Numbers ______

Provenience ____________ Organic Box Numbers ______

PIPES

CLAY PIPES-HISTORIC	4/64	5/64	6/64	7/64	8/64	9/64	Indet.	Total Stems	Total Bowls
White									
Red									
Total									

OTHER PIPES	Stem	Bowl	Total
Porcelain			
Other			

GLASS

BOTTLE GLASS	BODY/UNDIAG.	NECK	BASE	TOTAL
Freeblown				
Blown in mold				
Automatic machine-made				
Indeterminate				
Total				

DRINKING VESSEL	BODY/UNDIAG.	RIM	BASE/STEM	HANDL	TOTAL
Freeblown					
Machine blown/Pressed					
Indeterminate					
Total					

BOTTLE CLOSURES

BOTTLE CLOSURE	TOTAL
Ceramic	
Glass	
Metal	
Wood/Cork	
Synthetic	
Other	

Cataloged by ____________ Date ____________

P. 5

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________________ Inorganic Box Numbers______

Provenience______________ Organic Box Numbers_______

APPAREL	TEXTILES			LEATHER			SYNTHET.			TOTAL			
Clothing													
Footwear													
Other													
Indeterminate													

BUTTONS	FERROUS	BRASS	OTH. METAL	GLASS	MILKGLASS	PORCELAIN	BONE	SHELL	LEATHER	SYNTHETIC	OTHER	TOTAL			
One piece cast															
Two piece cast															
Two piece stamped															
Three piece stamped															
Four piece stamped															
Other															
Total															

BUCKLE															
OTHER FASTENERS															

HOUSEHOLD AND PERSONAL OBJECTS	FERROUS	COPPER	BRASS	LEAD	TIN	SILVER	PEWTER	OTH. METAL	GLASS	CERAMIC	BONE	SHELL	LEATHER	CLOTH	WOOD	SYNTHETIC	OTHER	TOTAL		
Tableware																				
Kitchenware																				
Furniture and Hardware																				
Lighting Fixtures																				
Decorative Objects																				
Toiletries																				
Stationery																				
Coins/Tokens/Medals																				
Personal Objects																				
Toys																				
Other																				
Indeterminate																				

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________________ Inorganic Box Numbers ______

Provenience ____________________ Organic Box Numbers ______

ARCHITECTURAL MATERIAL

WINDOW GLASS	TOTALS			
Crown/Cylinder				
Plate				
Other				
Indeterminate				
Total				

STRUCTURAL MATERIAL	TOTAL				
Brick					
Mortar/Plaster					
Wood					
Linoleum					
Stone					
Fiber					
Porcelain					
Earthenware/Stoneware					
Synthetic					
Metal					
Other					

NAILS	TOTAL			
Handwrought 1620-1830				
Machine cut:1795-1850				
Machine cut:1840-1885				
Wire : 1885+				
Indeterminate				
Total				

SCREWS	TOTAL			
Hand wrought				
Machine cut				
Indeterminate				
Total				

OTHER FASTENING DEVICES	TOTAL			
Staples				
Bolts				
Wood Fasteners				

OTHER HARDWARE	FERROUS	COPPER	BRASS	LEAD	OTHER	INDETER.	TOTAL	
Other Builders' Hardwr.								
Window Hardware								
Door Hardware								
Electrical Hardware								
Plumbing Hardware								
Lighting/Heating Hdwr.								
Other								
Indeterminate								

Cataloged by ____________ Date ______________

P. 7

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________________ Inorganic Box Numbers______

Provenience______________ Organic Box Numbers_______

TOOLS AND HARDWARE

	FERROUS	COPPER	BRASS	LEAD	TIN	SILVER	PEWTER	OTH.METAL	BONE	LEATHER	WOOD	CLOTH	SYNTHETIC	OTHER	INDETER.	TOTAL
Hand Tools																
Machine Parts																
Domestic Animal Gear																
Transportation Objects																
Weaponry/Accoutrements																
Other																
Indeterminate																

FUEL AND FIRE BYPRODUCTS

	WEIGHT	TOTAL
Coal		
Charcoal		
Ash/Cinders/Clinkers		
Wood		
Slag		

Cataloged by____________ Date____________

P. 8

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ______________ Inorganic Box Numbers ______

Provenience ______________ Organic Box Numbers ______

FAUNAL AND FLORAL REMAINS

	BIVALVES	WEIGHTS	RIGHT VALVES	LEFT VALVES	TOTAL	
BIVALVES	Mercenaria mercenaria					
	Crassostrea virginica					
	Mya arenaria					
	Ensis directus					
	Argopecten irradians					
	Spisula solidissima					
	Mytilus edulis					
	Other marine bivalves					
	Indeterminate bivalves					

	UNIVALVES	WEIGHT	No. of	TOTAL	
UNIVALVES	Busycon canaliculatum				
	Crepidula fornicata				
	Nassarius obsoletus				
	Polinices duplicatus				
	Urosalpinx cinera				
	Other Gastropods				
	Indeterminate univalve				

	Indeterminate shell			
	OTHER ORGANIC			

	BONE	DIAGNOSTIC	TOTAL
BONE	FISH		
	WHALE		
	HUMAN		
	MAMMAL		
	BIRD		
	OTHER		
	INDET.		
	TOTAL		

	VEGETAL MATERIAL	TOTAL	
VEGETAL	SEEDS/NUTS		
	OTHER COMESTIBLES		
	OTHER VEGETAL MATERIAL		

Cataloged by ______________ Date ______________

1983 ARTIFACT CATALOG
ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT

Site ____________ Inorganic Box Numbers ______

Provenience ____________ Organic Box Numbers ______

LITHICS

	TOTAL
FIRE-CRACKED ROCK	
UNWORKED LITHIC	

GUNFLINTS	TOTAL
Rounded Heel	
Rectangular Heel	
Indeterminate	

GROUNDSTONE	PESTLES	MORTAR	OTHER
Historic			
Prehistoric			

CHIPPED STONE	CORE	SHATTER/BLOCK	TRIM FLAKE	THIN. FLK.	DECORTIF. FLAKE	FLAKE	UNIFACE	POINT	BIFACE	TOTAL
Quartz										
Quartzite										
Weathered Felsite										
Red/Purple Felsite										
Other Felsite										
Fine-grained Felsite										
Chert										
Other Fine-grained										
Total										

SAMPLES	TOTAL
Soil	
C-14	

Cataloged by ____________ Date ____________

P. 10

APPENDIX 5

Item-Based Catalog: Reconstructed Earthenware Vessels

VESSEL #	CERAMIC TYPE	VESSEL FORM	FRAGMENT VESSEL FORM	# of Frgs.	ARTIFACT NUMBER	PPAL PROVENIENCE		ACMP PROVENIENCE

APPENDIX 6

Item-Based Catalog: Whole Bottles

VESSEL #	FORM	CONTENTS	MANUFACTURE	DATE	COMMENTS	ACMP PROVENIENCE

Division of Cultural Resources
North Atlantic Regional Office
ARCHEOLOGICAL COLLECTION MANAGEMENT PROJECT

1983 ARTIFACT TREATMENT FORM

Site ____________________ Catalogue # ____________________

Provenience ____________________ Specimen # ____________________

DESCRIPTION OF SPECIMEN:

Material Type ____________________

Condition ____________________

Dimensions ____________________

Remarks:

Weight before Treatment __________ grams

Weight after Treatment __________ grams

DESCRIPTION OF TREATMENT:

Chemical Solution ____________________

Dates of Application ____________________

Method of Application ____________________

Dates of Drying ____________________

Remarks:

RESULTS:

Name ____________________ Date ____________________

CATEGORIES FOR DETERMINING A MEAN CERAMIC DATE

Ceramic Type	Type No.	Date Range	Median Date	Sherd Count	Product
Combed (Lead Glazed Slipware)	56	c. 1670-1795	1777	1039	1846303
Sgraffito	63	1650-1710	1680	477	801360
Wrotham Slipware	67	1612-1700	1656		
"Metropolitan" Slipware	68	1630-1660	1645		
Red Marbelized Slipware (N.Ital)	70	1610-1660	1635		
Wanfried Slipware	73	1580-1625	1603		
Coarse agate ware	35	1750-1810	1780		
Iberian Storage Jars	38	1745-1780	1763		
Buckley ware	47	1720-1775	1748		
North Devon Gravel Tempered	61	1650-1775	1713	48	82224
Debased Rouen Faience (Eng. sites)	21	1775-1800	1788		
Delft-Pedestal foot ointment pot	32	1730-1830	1780		
Delft-plain everted rim ointment pot	45	1700-1800	1750		
Delft-decorated 17th century	49	1600-1802	1650		
Delft-decorated 18th century	49	1600-1802	1750	586	1025500
Delft-plain wash basin	57	1750-1800	1775		
Delft-Mimosa pattern	60	1710-1740	1725		
Delft-English (Blue dash chargers)	62	1620-1720	1670		
Delft-cylindrical ointment pots	64	1630-1700	1665		
Delft-plain white	65	1640-1800	1720		
Delft-monochrome apothecary jars	71	1620-1775	1698		
Delft-polychrome apoth.jars/pots	72	1580-1640	1610		
Delft-chamber pots	76	1660-1800	1730		
Creamware-fingerpainted	8	1790-1820	1805		
Creamware-annular	14	1780-1815	1798		
Creamware-lighter yellow	15	1775-1820	1798		
Creamware-overglz enam. hp	18	1765-1810	1788		
Creamware-	22	1762-1820	1791		
Creamware-transfer printed	23	1765-1815	1790		
Creamware-deeper yellow	25	1762-1780	1771		
Creamware-"Littler's Blue"	41	1750-1765	1758		

APPENDIX 8

CATEGORIES FOR DETERMINING
A MEAN CERAMIC DATE

Ceramic Type	Type No.	Date Range	Median Date	Sherd Count	Product
Pearlware-underglz poly(stenciled)	4	c. 1820-1840	1830		
Pearlware-mocha	6	1795-1890	1843		
Pearlware-fingerpainted	8	1790-1820	1805		
Pearlware-embossed feathers,fish sc.	9	1800-1820	1810		
Pearlware-transferprinted,willow	10	1795-1840	1818		
Pearlware-transferprinted	11	1795-1840	1818		
Pearlware-underglz polychrome	12	1795-1815	1805		
Pearlware-annular	13	1790-1820	1805		
Pearlware-underglz blue hp	17	1780-1820	1800		
Pearlware-blue & green edged	19	1780-1830	1805		
Pearlware-undecorated	20	1780-1830	1805		
Whiteware (hardwhite)	2	1820-1900+	1860		
Mocha	6	1795-1890	1843		
Jackfield	29	1740-1780	1760	7	12,320
Greenglazed creambodied ware	33	175 -1775	1767		
Whieldon ("Clouded wares")	36	1740-1770	1755		
Refined agate ware	42	1740-1775	1758		
Astbury	51	1725-1750	1738		
Luster decorated wares	78	1790-1840	1815		
Porcelain-Canton	5	1800-1830	1815		
Porcelain-overglz enam(China trade)	7	1790-1825	1808		
Porcelain-overglz enam(" export)	26	1660-1800	1730	— deleted	---South 1978
Porcelain-English	31	1745-1795	1770		
Porcelain-underglz blue Chinese	39	1660-1800	1730	---deleted-	---South 1978:
Porcelain-"Littler's Blue"	41	1750-1765	1758		
Porcelain-chinese,underglz blue Late Ming	69	1574-1644	1609		

CATEGORIES FOR DETERMINING
A MEAN CERAMIC DATE

Ceramic Type	Type No.	Date Range	Median Date	Sherd Count	Product
Brown stoneware bottles-ink,beer	1	c. 1820-1900	1860		
Nottingham	46	1700-1810	1755	6	10530
Burslem"Crouch" palebrown mugs	52	1700-1775	1738		
Brown salt-glazed (Fulham)	53	1690-1775	1733	137	237421
British brown (not #1,52,53)	54	1690-1775	1733		
Bellarmine-deterior. face bottle	66	1620-1700	1660	85	141100
Bellarmine-wellmolded face	74	1550-1625	1588		
Rhenish brown glazed,cologne type	75	1540-1600	1570		
Westerwald,stamped blueflor/geom	44	1700-1775	1738	176	305888
Rhenish, blue/manganese,sprig/mold	58	1650-1725	1668		
Rhenish,embel. hohr gray	59	1690-1710	1700		
Westerwald chamber pots	77	1700-1775	1738		
White salt-glz ,moulded	16	1740-1765	1753		
Debased scratch blue	24	1765-1795	1780		
White salt-glz, transferprinted	30	1755-1765	1760		
Scratch blue	34	1744-1775	1760		
White salt-glz(exc.plates,moulded)	40	1720-1805	1763		
White salt-glz, Littler's blue	41	1750-1765	1758		
White salt-glz plates	43	1740-1775	1758		
White salt-glz, slip-dipped	48	1715-1775	1745	204	355980
Scratch brown or trailed wh.salt	55	1720-1730	1725		
Ironstone/granite china	3	1813-1900	1857		
Black Basaltes	27	1750-1820	1785		
Engine turned unglzd red	28	1763-1775	1769		
Refined red, sprigged, unglz	37	1690-1775	1733		
Ralph Shaw, brown, slipped	50	1732-1750	1741		
TOTAL				2765	4818626
SITE CERAMIC TOTAL				31042	—

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