Contents

Introduction .................................................. 1
Context ......................................................... 5
Historical Background .................................................. 5
Archaeological Background .................................................. 6
Research Design ............................................ 8
  1994 Objectives .................................................. 8
  1995 Objectives .................................................. 10
  1994/1995 Methods .................................................. 11
  1994/1995 Expected Results .................................................. 12
Fieldwork Results ........................................... 15
  1994 Area Excavation .................................................. 15
  1994 Survey Test Pits .................................................. 19
  1995 Shovel Test Hole Survey .................................................. 20
  1995 Test Pits .................................................. 21
  Soil Analysis .................................................. 22
Summary ..................................................... 23
Conclusions .................................................... 25
Future Research .................................................. 28
Bibliography .................................................. 29
Appendix A .................................................. 31
  Finds List .................................................. 31
The Virginia Company Foundation (VCF) is a non-profit organization devoted to the archaeology and research of sites dating to the first years of English settlement of Virginia. It has been conducting archaeological research at Fort Raleigh National Historic Site, Roanoke Island, North Carolina, since 1991 (Figure 1). The first two years focused on the excavation of a metallurgical and distilling area, a "science center," located adjacent to the west side of the reconstructed earthen fort and associated with the 1585-86 colony of Ralph Lane. This work is the subject of a separate report authored by Ivor Noel Hume that will be submitted to the National Park Service (NPS) in early 1996.

In 1994, the VCF commenced three area excavations in the vicinity of the reconstructed earthen fort to reexamine features that were first recorded by J.C. Harrington during his survey of the park in 1947-48 and possibly related to English occupation from 1585-87. The VCF also conducted limited testing away from the immediate vicinity of the reconstructed earthen fort in 1994. No European artifacts or features associated with the 16th-century English settlements at Roanoke Island were found. The survey did locate a deeply buried layer containing Native American Colington ceramics in the heavily wooded area between the earthen fort and the Elizabethan Gardens which had never been previously tested.

The 1995 field season consisted of a shovel test survey supplemented by the excavation of several larger test units to define the cultural layer discovered in 1994 and to determine if it also contained evidence of 16th-century English settlement. Although no features were found, the survey did recover European artifacts dating to the 16th century from this area.

The Project Director for the 1994-95 Fort Raleigh Archaeological Project was VCF president Dr. William M. Kelso, who provided general direction for the fieldwork and report production. Nicholas M. Luccketti was the project archaeologist supervising the fieldwork. Ivor Noel Hume, who was Project Director for the 1991-93 science center excavations, was an advisor to the project. Dr. David Phelps, Director of the Coastal Archaeology Office of the Institute for Historical and Cultural Research at East Carolina University, generously served as the prehistory consultant for the 1994-95 projects. He identified all Native American artifacts recovered during the excavations and made three on site inspections, one in 1994 and two in 1995.

The 1994 field crew consisted of VCF personnel David K. Hazzard, William M. Kelso, Eric Klingelhofer, William L. Leigh, III, Nicholas M. Luccketti, Jamie May, Alastair Macdonald, Ivor Noel Hume, Nate Smith, Martha Williams and NPS archaeologist Ken Wild. Members of the 1995 field crew were David K. Hazzard, Nicholas M. Luccketti, Alastair Macdonald, Martha Williams, Gail Wharton, and Robert Wharton with assistance from Dr. Paul Green, Thomas MacDonald, and Dane Magoon. Artifacts collected during the area excavations and survey were processed by VCF curator Beverly A. Straube. She also identified the European objects and edited the final report in her usual thoughtful manner. Dr. Gerald Johnson, Professor of Geology at the College of William and Mary, amiable provided his expertise, as he has done so many times in the past, regarding soils of the project area and Dr. Stanley Riggs, Distinguished Professor of Geology at East Carolina University kindly identified geological specimens.

Funds to support the 1994 fieldwork were provided in large part by the Fort Raleigh National Historic Site thanks to the interest of then Superintendent Tom Hartmann and Cultural Resource Manager Mary Collier. A significant financial contribution to the 1994 project was made by the Roanoke Colonies Research Office of the Institute for Historical and Cultural Research at East Carolina University through the efforts of Dr. Keats Sparrow, Dean of Arts and Sciences. Financial support in 1995 was drastically diminished to only a VCF grant for staff lodging which unfortunately reduced the normal field season by half. Accordingly, a particular debt of gratitude is owed to the 1995 field crew whose commitment to archaeology at Fort Raleigh is such that they were not deterred by the lack of compensation for either their time or expenses.
The VCF/NPS archaeological work was a major component of “The Riddle of Roanoke,” a television program produced by New Dominion Pictures for the Archaeology series on the Discovery channel and included footage of the 1994 fieldwork as well as an interview with Ivor Noel Hume.

Of course, the VCF Fort Raleigh Archaeological Project would not be possible without the support and cooperation of Fort Raleigh National Historic Site and the Southeast Archaeological Center of the National Park Service. Superintendents Tom Hartman, now retired, and Russ Berry, Assistant Superintendent Mary Collier, Supervisory Park Ranger Andrew Kling, and Curators BeBe Woody, now retired, and Steve Harrison have all made substantial contributions to the ongoing research, ranging from their official management duties to their continuing encouragement and willingness to help in whatever manner possible. A special acknowledgment is due NPS Civil Engineer Charley Snow, whose unflagging assistance through the years, whether it was surveying, removing sidewalks, backfilling or any number of other tiresome requests made of him and his staff, has been of immeasurable help during the course of the Fort Raleigh Archaeological Project. The National Park Service Southeast Archaeological Center (SEAC) regional archaeologist Bennie Keel, who participated in the science center excavations, provided much needed advice, while SEAC archaeologist Ken Wild was an extremely valuable member of the 1995 team. The author is indebted to the Association for the Preservation of Virginia Antiquities (APVA) for graciously allowing this report to be produced at its archaeological facility at Jamestown Island and particularly to the APVA Laboratory Manager Elliott Jordan who skillfully designed and produced this report. The confluence of the VCF mission and the APVA’s decision to expand its archaeological program resulted in a formal consolidation of the two organizations in 1996. Finally, the author is most grateful to Ivor Noel Hume, William M. Kelso, and David K. Hazzard for allowing me to continually pester them for their insights on the archaeology at Fort Raleigh.

The 1994 fieldwork was conducted from October 15-October 29 and the 1995 fieldwork from November 6-November 12. All errors are the responsibility of the author.
Figure 1: Roanoke Island and vicinity (Harrington 1962).

Approximate location of Indian village of Dasamoonweapuk.
Historical Background

The history of the English settlements at Roanoke Island has been researched in great detail and extensively published, therefore it is unnecessary to provide a shallow repetition of this material in this report. Nevertheless, it is important for evaluating archaeological investigations to briefly describe those events that may have left archaeological remains at Roanoke Island in the 16th century.

In 1584, Sir Walter Raleigh received a charter from Queen Elizabeth to colonize part of North America in hopes of establishing an English Empire there. A reconnaissance voyage to North Carolina that same year returned with a promising report of the country, which was named Virginia after Elizabeth, the Virgin Queen. Raleigh’s first colony, consisting of 108 men under the leadership of Sir Richard Grenville and Ralph Lane, landed at the north end of Roanoke Island in July of 1585. A letter written by Ralph Lane to Richard Hakluyt was addressed “From the Newe Forte in Verginia, the 8th daye of September:1585” (Quinn 1991:214). The records also suggest that the colonists built a town separate from the fort (Noel Hume 1994:37). In addition to exploring the surrounding country, observations and experiments were conducted by scientist Thomas Hariot and by Joachim Gans, a metallurgist or ‘mineral man’ as he was called at the time. Archaeological research, discussed below, indicates that a scientific laboratory for Hariot’s and Gans’ work was set up apart from both the town and fort. When supply ships commanded by Sir Richard Grenville, who had returned to England in August of 1585, were late in returning to the colony in 1586, the discouraged colonists abandoned Roanoke Island with Sir Francis Drake who had arrived from a Caribbean expedition in June of that year.

The second colony is a consequence of the late arrival of Grenville’s resupply. In August of 1586, Grenville returned to England after finding the settlement abandoned, however, he left a garrison of 15 men on Roanoke Island to hold it for the Queen. A captured Spanish pilot, Pedro Diaz, although he was not allowed to leave the ship, reported that the settlement had “…a wooden fort of little strength…” (Quinn 1991:790).

Raleigh dispatched another colony to Roanoke Island in 1587. The 117 men, women, and children arrived to find the 1585 fort ruined. The old houses were repaired and new cottages were built; all protected by a new fort apparently constructed of posts set side-by-side in a trench. Governor John White, apparently an ineffective leader, was persuaded to return to England for supplies, leaving on Roanoke Island his daughter Eleanor and her husband Ananais Dare, the parents of the fabled Virginia Dare, the first English child born in Virginia. White’s return to Roanoke Island was delayed due to war between England and Spain. When he arrived back on Roanoke Island in 1590, White, of course, found no one on there. He did find, in his words

…the place very strongly enclosed with a high palisado of great trees, with curtains and flankers very Fort-like, and one of the chief trees or posts at the right side of the entrance had the barke taken off, and 5 foote from the ground in faire Capitall letters was graven Croatoan without any crosse of distress, this done, we entered into the palisado, where we found many barres of Iron, two pigges of lead, four iron fowlers, Iron saker shot, and such like beavic things, thrown here and there, almost overgrown with weeds and grass (Quinn 1991:614).

Despite several attempts to locate the missing settlers, they were never found and became the legendary “Lost Colony.” A small earthen fort, known as Fort Raleigh, is located at the site, but who built it, and when, is uncertain.
Archaeological Background

The archaeological history of the search for the Cittie of Raleigh began in earnest in 1947 and 1948 when J.C. Harrington excavated a series of test trenches at Fort Raleigh National Historic Site (Figure 2), and later in 1953 on the adjoining Elizabethan Garden property. Harrington excavated at least 38 separate five-foot wide trenches (depending upon how you count them) for a total length of 3,320 linear feet. Harrington found only 18 artifacts that could be attributed to the 16th-century and concluded that the habitation, or town, site was elsewhere. The remains of the earthen fort were excavated in 1950 (Harrington 1962). Later in 1965, Harrington excavated what he termed an outwork: a 9-ft. square structure constructed of post or taproot molds and log stains just outside the entrance of the reconstructed earthen fort (Harrington 1966). Within the structure were three pits, one of which contained brick, tile, burned clay, Indian pottery, and sherds of a Normandy flask.

Fort Raleigh National Historic Site’s Phillip Evans, a dedicated student of the Roanoke settlements, noticed a similarity between Harrington’s outwork and flanks of a c.1619 wooden fort excavated by Noel Hume at Martin’s Hundred in James City County, Virginia (Noel Hume 1982). Evans suggested that perhaps the outwork was a bastion for a wooden fort that preceded the construction of the earthen fort. This supposition prompted a survey by NPS archaeologists in 1982. John Ehrenhard, William Athens, and Gregory Komara examined the area west of the reconstructed fort using proton magnetometry, soil resistivity, infrared photography, and soil chemical tests. Subsequent field testing of selected anomalies were conducted in the fall of 1982 and in 1983. Only one of these areas, near the entrance of the fort and Harrington’s outwork, produced 16th-century artifacts that eventually proved to be sherds of crucibles, flasks, and English or Netherlandish tin-enameled ointment pots. No structural features related to houses or fortifications were positively identified (Ehrenhard, Athens, and Komara 1983; Ehrenhard and Komara 1984). The nature of the outwork remained unresolved. Also in 1982, Phillip Evans discovered a barrel and a

Figure 2: Location of test trenches excavated 1947-1948 (Harrington 1962).
hollow log in the shallows of Roanoke Sound about 600 ft. north of the reconstructed earthen fort. Both objects had a C-14 date range that encompassed the 16th century and they may have been the bottoms of wells (Noel Hume 1994:88-89).

The Virginia Company Foundation initiated the Fort Raleigh Archaeological Project in 1991 under the guidance of Project Director Ivor Noel Hume and President Dr. William M. Kelso. Noel Hume's efforts to puzzle out the nature of the first forts at Jamestown included reviewing earlier English fortifications which, in turn, led him back to the Roanoke Island earthwork, Harrington's outwork, and Phil Evans observation on the resemblance of the outwork to the Wolstenholme Towne flankers.

Test trenches dug in the spring of 1991 relocated the area of Harrington's outwork and of the 1983 NPS excavation area that yielded numerous 16th-century ceramics. In the fall of 1991 and 1992, a team of 9 VCF archaeologists working with SEAC archaeologist Bennie Keel, 6 assistants, and several NPS rangers and interpreters volunteering as soil sifters, opened up an area west of the reconstructed earthen fort entrance. The purpose was to determine whether the appendages extending off of the Harrington outwork were in fact sections of palisaded walls of a wooden fort. The excavations found no evidence to suggest that the outwork was a flanker to a wooden fort, but instead, discovered the partially preserved remains of a scientific workshop floor. More than 100 artifacts were found, consisting principally of crucible sherds, Normandy flask sherds, fragments of chemical glassware, worked and unworked copper, antimony (an essential ingredient in separating silver from copper), and sherds of delftware ointment pots. These all point to the distilling experiments of Thomas Hariot and the metallurgical work of Joachiim Gans who were members of only the Lane Colony. The relationship of the earthen fort to the scientific workshop is still a matter of debate; one interpretation is that the earthen fort was constructed to protect the workshop while a competing argument believes that the earthen fort was erected on top of, and therefore, after, the workshop area was deserted. A detailed field report on this work was submitted to the NPS in 1996, though much of this research is discussed in The Virginia Adventure, From Roanoke to James Towne: An Archaeological Odyssey (Noel Hume 1994).

Despite this remarkable discovery, no remains of the people, houses, or forts of either the 1585 Lane Colony or John White's 1587 "Lost Colony" have yet been found.
1994 Objectives

One objective of the 1994 survey was to re-examine several 1947-48 Harrington test trenches that contained features that might be postholes. Test excavations in these locations endeavored to determine if the features recorded by Harrington were postholes, the date of the postholes, and what kind of structure(s), if any, they represented.

One Harrington trench extended north from the east bulwark of the earthen fort (Figure 3). The presence of possible postholes in this area was explored in light of the following theory. The “science center,” with its furnaces containing potentially dangerous fires and offensive fumes, would have been located outside, but not far from the village. The barrel well found on the beach is a remnant of the severely eroded village site and thus, the direction of settlement is north from the “science center” toward the barrel well. Accordingly, it is plausible that if the features in the Harrington trench were actually postholes, they may represent peripheral village structures.

A Harrington trench that contained a linear soil stain and located approximately 100 ft. west of the earthen fort’s entrance was also reevaluated (Figure 4). Within the past decade, excavations at four sites in Virginia, including most recently Jamestown Island, have uncovered evidence of wooden fortifications. The Nansemond Fort site, the Nicolas Martiau Fort, the Middle Plantation palisade (Kelso, Luccketti, and Straube 1990), and the Jamestown Island first settlement site all produced unmistakable archaeological footprints of palisade fortifications that were constructed by setting small posts or trees and split rails into a narrow slot trench. These features closely resemble the linear soil stain unearthed by Harrington (Kelso, Luccketti, and Straube 1995). If the Fort Raleigh feature is indeed a palisade slot trench, it would have major implications regarding the theory that the earthen fort with its western entrance, is a bulwark for a much larger wooden fort extending to the west.

Figure 3: Plan of Harrington’s excavations showing possible postholes north of fort (FRNHS).
Reconstructed Earthwork

Vicinity of 1585-1586 scientific workshop

Possible slot trench

Possible postholes

Figure 4: Plan of Harrington's excavations showing features west of the reconstructed earthwork (FRNHS).
A third Harrington trench, about 175 ft. northwest of the earthen fort entrance, was selected for investigation because it had four posthole-like features in a line suggestive of an earthfast structure (see Figure 4). It also yielded several of the few 16th-century artifacts that were found by Harrington during his testing.

The second objective of the 1994 survey was to determine whether there was any archaeological evidence of 16th-century settlement between the fort and the location of the previously mentioned eroded barrel well(s) (Figure 5). A transect of 5-ft. squares was excavated north from the earthen fort toward the base of the sand dunes. The goal was to determine whether there are any 16th-century artifacts, undisturbed strata, or features present within this area.

Lastly, the bulk of the previous archaeological work at Fort Raleigh has concentrated on the immediate environs of the reconstructed earthen fort with little exploration of the heavily wooded land toward the Elizabethan Gardens (see Figure 2). Selected test units were excavated in this latter area in 1994.

1995 Objectives

The prime objective of the 1995 survey was to survey the wooded area between the Elizabethan Garden and the earthen fort to determine the extent and nature of the site identified by the 1994 survey, and particularly if it contained any evidence of 16th-century English occupation. Colington Plain and Simple Stamped ceramics were recovered from a buried organic stratum in a 1994 test square in this area, about 150 ft. from Roanoke Sound and 450 ft. west of the earthen fort, indicating that this site dated to the protohistoric period. The stratum appears to be identical to a buried A soil horizon located by Bennie Keel while monitoring the excavation of sewage pipe trenches in the septic field at Fort Raleigh. Dr. Keel recovered three sherds of Colington Simple Stamped pottery from the A horizon, which he identified as a dune-covered ground surface dating to the late prehistoric-early historic period. No shell, bone, midden debris, or features were found (Keel 1991).

It is possible that this area, apparently first inhabited by Native Americans, was reoccupied in some part by the Roanoke colonists, who allegedly settled not far from the Indian village at the north end of Roanoke Island, which conventional wisdom places at Dough’s Point. By means of a systematic shovel test survey and excavation of selected larger test units, the project endeavored to determine whether there were any 16th-century European artifacts and/or features present.
1994/1995 Methods

The 1994/1995 projects employed the same grid that was previously established for the 1991 through 1993 VCF projects with one modification. The previous VCF grid was composed of 50 ft. blocks and each block was subdivided into 16 10-ft. squares separated by alternate 2 ft. and 3 ft. wide balks. The revised grid contains the same datum points, baselines, and blocks, only the blocks are now comprised of 25 10-ft. squares with no predesigned balks. All shovel test holes and test units were assigned an individual Fort Raleigh Excavation Register (FRER) number, continuing with the sequence used in 1991-1993, and a 10-ft. square was the largest test unit to receive an FRER number. All test units were mapped on a site plan at a scale of 1/4” = 1’. All shovel test holes were documented on a shovel test register form while each test unit was documented on a VCF excavation register form. A plan and profile for each test unit were drawn at a scale of 1/2” = 1’. All features were mapped. Black-and-white photographs and color slides were taken to record features and profiles of each test unit. Elevations of each test unit were taken in reference to the FDR monument as in the 1991-1993 projects. The location of test units and elevations was recorded in 1995 field season using a NPS total station.

All shovel test holes and test units were excavated following natural stratigraphy. All soil from each shovel test hole and test unit was screened through 1/4 in. mesh and all artifacts were collected. Soil samples were taken for chemical analysis from strata that had cultural significance. While the principal goal of the 1994/95 projects was survey, the area excavations included testing of features that might have been 16th century. Paleoethnobotanical, pollen, and phytolith samples were collected if the Project Archaeologist in consultation with the NPS archaeologist determine that such sampling was warranted. If present, C-14 samples from features or undisturbed strata were taken. A lacquer peel of selected stratigraphic profiles was prepared for analysis under laboratory conditions.

All artifacts recovered during the survey were washed, labeled with their respective FRER num-

Figure 6: Plan of earthfast structures from c. 1618 Maine site (Outlaw 1990).
ber, identified, and stored in archival bags and boxes. All artifacts were catalogued on the NPS Automated National Cataloguing System and this information will be provided to the NPS in hard copy in addition to excavation register records, original site plans and profiles, color slides and negatives. Prior to backfilling all the shovel test holes and test units were lined with black plastic. A penny dated either 1994 or 1995 in a film canister also was placed into each backfilled shovel test hole and test unit.

1994/1995 Expected Results

It was anticipated that any surviving remains of either the 1585/86 or 1587 settlements will consist of earthfast structures, possibly irregular and shallow postmold patterns similar to those found at the c.1618-1625 Maine site (Figure 6) just outside Jamestown (Outlaw 1990). The wooden fortifications of the two settlements may resemble the post-rail-plank fort excavated by Ivor Noel Hume at Martins Hundred (Noel Hume 1982) or possibly a palisade of small posts and split rails set into a slot trench similar to those of the early 17th-century forts excavated by the VCF at the Nansemond Fort site in Suffolk, Virginia and Yorktown, Virginia (Kelso, Luccketti, and Straube 1990).

Archaeological research on early 17th-century sites in Virginia, including a current project at Jamestown to search for the first fort and settlement, has resulted in a knowledge of artifact assemblages, particularly ceramics, that might be found at either of the two Roanoke settlements. The ceramic types that might be associated with the settlements include:

**Earthenware, English**
- North Devon
- Borderware
- Delftware
- East Anglia
- Staffordshire blackware
- Midlands purple butter pot

**Earthenware, European**
- Dutch coarseware
- Dutch delftware
- Italian majolica
- Berettino
- Montelupo
- Saintonge
- Spanish majolica
- German refractory wares

**Earthenware, Iberian**
- Merida
- Sevillian olive jar

**Slipware, European**
- Dutch

**Stoneware, European**
- Beauvais
- Frechen
- Raeren
- Martin camp costrel

**Chinese Porcelain**
Figure 7: Location of 1994 excavations.
Figure 8: Location of 1995 test pits.

Notes:

1. Sizes of squares are approximate and their orientations are based on corner & oblique control points.
2. BM numbers are newly established benchmarks control points. The other numbering numbers are unadulterated numbers.
3. 100 ft is the top of the black layer.
4. Elevations are relative to the surveyed FDR surficial elevation, 1996 mean sea level.
5. "CP Structure", "Tent", and "Gate" refer to the George McClain reconstructions of excavations.
Fieldwork Results

The 1994 fieldwork consisted of three area excavations and nine survey test pits (Figure 7). The 1995 survey included the excavation of 14 shovel test holes, 3 small test pits, and 4 large test pits (Figure 8).

1994 Area Excavation

East Excavation Area:
Harrington Trench, North of the Reconstructed Fort

Since the precise location of this Harrington trench was unknown, the 1994 excavation began with a series of continuous 3 ft. wide trenches running west to east to intersect the Harrington trench. The first two 10-ft. trenches (FRER 63 and 64) were unsuccessful. The third 10-ft. trench was passed over due to the presence of a large tree, and the fourth 10-ft. trench (FRER66) also failed to find the Harrington trench. Consequently, the skipped third trench (FRER65) was excavated and, as luck would have it, the Harrington trench was found in it.

Two tree root stains/possible posthole features were exposed during the excavation of the 40-ft. long test trench and in the relocated Harrington trench, so the excavation was enlarged to determine if there were more features present and if they made any pattern (Figure 9). The 3-x-10-ft. test trench FRER65 was expanded into an 8-x-10-ft. excavation unit, still avoiding the large tree, while the adjoining test trench FRER66 was enlarged to a 10-ft. square. Both altered test units retained the FRER number assigned to their original test trench, respectively. A new 5-x-10-ft. unit (FRER67) was opened to uncover more of the Harrington trench.

The stratigraphy was consistent throughout the East Excavation Area: a 3-5 in. thick upper layer of sod, root mat, and loose grey sand, a 6-9 in. thick layer of compact light grey sand that sealed a bottom layer of 2-3 in. of mottled brown sand. Several treehole/possible posthole features
were uncovered all having the same general appearance: amorphous shapes with very indistinct lines and a large core of black sand with a halo very light grey-to-whitish sand. Two such features, FRER65F and G, were sectioned, revealing irregular and tapering profiles and changing soil colors, all of which suggest that the features are not man-made (Figures 10 and 11).

No artifacts were found in either the strata or features, further evidence of the lack of cultural activity in this area.

Figure 19: Section of FRER 65G, facing south. This feature was intentionally overdug to examine fill and subsoil.

Figure 11: Section of FRER 65F, facing west.
Central Excavation Area: Harrington Trench with Ditch

The south half of square FRER72 and north half of square FRER73 were first excavated in an unsuccessful effort to relocate the Harrington trench in this area. Subsequent excavation of the north half of FRER72 did find the Harrington trench, which was further exposed by excavating the southern halves of squares FRER74 and 75. The narrow linear soil stain or narrow trench was found in FRER75, though apparently it had been completely excavated within the Harrington trench. Several other features were uncovered including 2 tree root stains/possible posthole features resembling those found in the East Excavation Area, 2 small round postmold-like features, halves of two larger features with similar fill, and a large treehole or small pit (Figure 12). The only features tested were the linear soil stain (FRER75D) and the treehole/pit (FRER73D,E).

The stratigraphy across the Central Excavation Area generally corresponded to that found in the East Excavation Area. The humus and root mat was about 3 in. thick with an underlying 2-3 in. thick stratum of dark grey sand that sealed a layer of mottled sand.

The linear soil stain was trowel-cleaned to discern if it contained any postmolds set side-by-side that would be characteristic of a palisade, and none were apparent (Figure 14). A test cut of the feature revealed that it was very shallow, the bottom of the trench was only 8 in. below modern grade and did not even penetrate into the subsoil. The trench did have a well-defined contour with nearly vertical sides and a smooth bottom. No artifacts were found in the mixed sand that filled the trench. No postmolds were noted in the trench nor was their any indication that sharpened posts had

Figure 12: Plan of Central Excavation area.

**FRER #s 72 - 75**

**CENTRAL EXCAVATION AREA**

Figure 13: Unexcavated linear soil stain, facing east.
been driven into the bottom of the trench. The absence of postmolds and the shallowness of the trench indicate that it cannot be a palisade trench and more likely is of modern origin.

The large pit-like feature was sectioned and found to contain two layers, an upper stratum of mottled grey and light grey sand (FRER73D) that covered a layer of dark brown sand (FRER73E) (Figure 15). No artifacts were recovered from the section. The irregular sides and tapering deep bottom suggest that the feature is a treehole.

No artifacts were found in the Central Excavation Area.

West Excavation Area: Harrington Trench with Possible Postholes

This area was reinvestigated by the VCF first in 1991 when two test pits were excavated, one 10-x-10-ft. and one 5-x-10-ft., to uncover the possible postholes located by Harrington. The 1991 work was inconclusive, so additional excavation of this area was conducted in 1994 by opening 3 10-ft. squares (FRER 68, 76, 77), 2 half squares (FRER 70,77), and 1 three-quarters square (FRER69) (Figure 16).

There were several features (FRER68D, E,F,K and FRER69E) and other undesignated features in FRER70 that were comprised of a black sandy nucleus ringed with whitish-grey sand, identical in appearance to features interpreted as tree roots in the East Excavation Area. The general
stratigraphy was consistent with the other two excavation areas; beneath the humus and root mat was a layer of grey sand that covered a bottom layer of mottled light grey sand.

Features FRER68H, J, and K were sectioned and while FRER68K proved to be a treehole, features FRER68H and J appeared to be postmolds, though of unknown period. FRER68H and J both have well-defined edges in plan and were filled with brown sandy loam rather than the black and grey sandy loam that was found in treehole features. Also, both features had smooth, regular side walls and bottoms that are more characteristic of postmolds than treeholes (Figures 17 and 18).

No artifacts were found in the West Excavation Area.

1994 Survey Test Pits

A total of nine 5-x-5-ft. test pits were excavated in 1994. Three test pits (FRER60, 61 and 62) were excavated at 20 ft. intervals along a transect that extended from the service road that connects the parking lot to the amphitheater to the base of the dunes at the north end of the island. A fourth test pit (FRER83) was excavated between the parking lot and the sand dunes. One test pit (FRER78) was located just east of the fort and three test pits (FRER79, 80, and 81) were dug in the south end of the wooded tract between the reconstructed fort and the Elizabethan Garden. None of these test pits uncovered any prehistoric or historic strata, features or artifacts. One test pit, FRER82, contained evidence of 16th-century activity.

FRER82

Approximately 200 ft. west of the reconstructed earthen fort is a north-south ridge that separates the open park around the fort from an uneven heavily wooded section that adjoins the Elizabethan Garden. In 1947/48, Harrington excavated a test trench in this area about 375 ft. northwest of the fort and about 350 ft. south of Roanoke Sound and found two Spanish olive jar sherds in the upper sand layer. Aside from this, there has been no other archaeological testing here.

FRER82 was located about 400 ft. west of the fort and about 200 ft. from Roanoke Sound in a bottom that gradually slopes up to the south with sand ridges surrounding the remaining three sides. Beneath the humus were two layers of sand (FRER82B,C) consisting of an upper light brown loose sand covering a more compact stratum of pale brown, almost whitish, sand that together were 16 in. thick. Below this was an 8-10 in. thick layer of dark brown sand (FRER82D) with charcoal flecks and Native American ceramics (Figure 17: Profile of feature FRER68H, facing northeast. Figure 18: Profile of feature FRER68J, facing northeast.)
Dr. David Phelps identified the pottery as being 3 sherds of Colington Plain, 4 sherds of Colington Simple Stamped, 11 residual sherds, and one fragment of a tobacco pipe stem. No artifacts were found in the underlying brown sand layer (FRER82F) which was an old topsoil on top of sterile sand (Figure 20). No other artifacts were recovered from the FRER82D layer, nor were any cultural features observed.

1995 Shovel Test Hole Survey

A total of 15 shovel test holes (STH), FRER88-102, were excavated in 1995. The test holes were a minimum of 1 ft. in diameter and generally placed at 25 ft. intervals, though the topography and nature trail necessitated changing the spacing in some instances. The test holes were excavated in lines radiating out from FRER82 until the layer corresponding to FRER82D disappeared from the stratigraphy.

The shovel testing revealed that layer FRER82D was quite extensive. Twenty-five ft. to the west, test hole FRER90 located the black sand layer 17 in. below modern grade where it was 10

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Figure 19: FRER82 after excavation. The hole left of the ranging pole is a test hole, facing south.

Figure 20: South profile of FRER 82.

A - rootmat and loose grey sand
B - light brownish grey mottled sand (10YR 6/2)
C - pale brown compact sand (10YR 6/3)
D - dark brown sand with charcoal flecks (10YR 3/3)
E - (does not appear in section) Very dark grey sand “tree-hole” feature in top of layer F.
F - original topsoil, Brown/dark brown sand (10YR 4/3)
G - sterile, homogeneous tan sand

scale in feet 0' 1' 2'
in. thick. It contained charcoal bits, a shell fragment, and a piece of an English tobacco pipe bowl. The back sand layer was not present at either 50 ft. or 75 ft. west of FRER82. Test hole FRER91, 24 ft. east of FRER82, found the black sand layer over 2 ft. below modern grade. The 15 in. thick layer contained much charcoal but no artifacts. It was also present 62 ft. to the east in test hole FRER95, where 2 ft. below modern grade the black sand was 11 in. thick. No shell, charcoal, or artifacts were present at this point. Thick sand ridges prevented further testing to the east. The black sand layer was detected 25 ft. south of FRER82 in test hole FRER89 at a depth of 22 in. below modern grade. The 13 in. thick layer contained charcoal bits but no artifacts. Fifty ft. to the south, the black sand, nearly 14 in. below modern grade, diminished to 8 in. in thickness and was devoid of charcoal and artifacts.

Sand ridges blocked testing to the north, however test holes found the black sand layer running northeast from FRER82 at distances of 50 ft., 87 ft., and 100 ft. The 87 ft. test hole, FRER96, hit the black sand layer at slightly more than 2 ft. below modern grade where the layer was 8 in. thick and contained 6 small fragments of charred bone, 3 jasper flakes, 2 Colington sherds, and one sherd of Spanish olive jar. The 100 ft. test hole, FRER97, hit the black sand layer 22 in. below modern grade where it was about 12 in. thick and yielded charcoal bits, a sherd of Colington’s simple stamped pottery, and one sherd of Spanish olive jar.

1995 Test Pits

The two shovel test holes that produced European artifacts, FRER90 and FRER97, were expanded into 5-ft. squares; FRER103 was the square around test hole FRER90 and FRER105 was the square around test hole FRER97. A 2.5-x-9-ft. trench (FRER99) was excavated out from the north end of FRER97 to examine the relationship of the black sand layer to the nearby sand dunes. A 5-ft. square (FRER104) was dug in the wooded margin of the drain field adjacent to the amphitheater. A sand ridge separated FRER104 from FRER97. The larger test units were excavated in an effort to discover whether there were any features in the black sand layer as well as to obtain additional artifacts for dating and cultural affiliation.

FRER103, not surprisingly, exhibited a soil sequence identical to that found in square FRER82, although a thin mottled black sand layer (FRER103D) was noted between the overlying sand deposit (FRER103C) and the homogeneous black sand layer (FRER103E) (Figure 21). No cul-

![Figure 21: FRER103 after excavation, facing south.](image-url)
tural features observed at the surface of the black sand layer or after it was removed. The FRER103D layer did contain 4 shell fragments and 2 sherds of Colington Fabric-impressed and 1 Colington Residual sherd while the FRER103E layer yielded 5 shell fragments, 4 bone fragments, 2 Colington Plain sherds, 2 Colington Fabric-impressed sherds, 1 Colington Simple-stamped sherd, 9 Colington residual sherds, and a piece of grey flint. The flint has clearly been worked and most likely is a gunspall.

FRER105 also displayed the same stratigraphy as square FRER103, including the thin mottled black sand layer. Again, no features were seen either cutting into the black sand layer or sealed by the black sand layer. Artifacts collected from the black sand layer (FRER105E) were 4 shell fragments, 36 small pieces of charcoal, 1 fire-cracked rock, 2 quartz flakes, 2 chert flakes, 6 prehistoric sherds, and 1 small fragment of a locally-made tobacco pipe stem. A lacquer peel of the south profile of FRER105 was made in order to study the stratigraphy under laboratory conditions.

FRER99 extended north toward Roanoke Sound off the northwest corner of FRER105 with a 18 in. balk separating the two units. The stratigraphy remained consistent and it was quite evident that the black sand layer (FRER99E) ran underneath the sand dunes. While no features were apparent, the mottled (FRER99D) and black sand layers did produce 55 fragments of charcoal, 2 pieces of charred nut, 3 chert flakes, 8 prehistoric sherds, and 1 1/4 in. diameter lead ball.

FRER104 had the same stratigraphy as the above three test units and was devoid of features. The mottled (FRER104D) and black sand (FRER104E) layers contained 45 pieces of charcoal, 2 shell fragments, 3 quartz flakes, 2 jasper flakes, 2 sherds of Colington Plain, 2 sherds of Colington Simple-stamped, 11 Colington residuals, 1 crucible sherd, and 3 delftware glaze chips that had blue dots on a white background. The delftware glaze chips are too small to precisely date and presently can be attributed only to the period 1585-1800.

Three small test pits excavated in the southern end of the project area produced no prehistoric or historic strata, features, or artifacts.

Soil Analysis

The soil analysis consisted of a lacquer peel, 8 sediment samples, and 3 soil chemical samples taken from FRER105. The lacquer peel was made of the south profile by soaking the wall with lacquer, placing several layers of cheesecloth against the wall, and then painting a final coat of lacquer on the cheesecloth. The lacquer peel was only 2 ft. wide due to the extremely sandy soil. Once dry, the stiffened cheesecloth, which now had the outer surface of the profile glued to the cheesecloth, simply was peeled off of the wall and placed on a board for support. Dr. Gerald Johnson of the Geology Department of the College of William and Mary conducted a preliminary analysis of the peel and samples (Johnson 1996). Also, soil samples from FRER105E, FRER105F, and FRER105 sterile were tested by a commercial agricultural laboratory for organic matter, phosphorus, potassium, magnesium, and calcium.

FRER105E and FRER105F are the upper and lower parts of a paleosol, respectively. The paleosol developed on an aeolian sand and then was buried by a single event that lasted from several hours to several days. The upper paleosol has medium organic matter, the lower paleosol has low organic matter and the sterile has very low organic matter. The upper paleosol is also richer in potassium, and both parts of the paleosol contain more phosphates than the underlying sterile sand. Although both chemicals have been shown to be reflective of human activities (Pogue 1988), the chemical makeup of the samples is consistent with a natural unaltered soil. The sandy substrate, however, is not an effective medium for the attachment and retention of soil chemicals.

A more complete interpretation of the archaeological record and the conditions at the time of the Roanoke settlements could be obtained by the following:
1) determining the topography of the modern ground surface and the paleosol;
2) obtaining three additional complete soil lacquer peels from other locations at FRNHS; and,
3) detailed textural and compositional analysis of the sands.
Summary

The main thrust of the VCF research in 1994 was to determine whether there was any archaeological evidence of either the 1585 or 1587 colonies in two specific zones. The first zone extended north of the reconstructed earthen fort to the sand dune ridge along the north edge of Roanoke Island toward the beach where several artifacts and the remains of at least one, and possibly two wells, all attributable to the 16th century, had been found. The survey tested the theory that the beach artifacts and wells are the remnants of the 1585/1587 settlements since lost to erosion and that the science center was on the periphery of the village. The East Excavation Area, north of the reconstructed earthen fort, and the four test squares at the base of the sand dunes produced no 16th-century artifacts, no shell or bone, and no features or strata related to the Roanoke settlements.

The second zone, west of the reconstructed earthen fort, addressed the speculation that the earthen fort is a western strongpoint or bulwark for a wooden fort by investigating features first uncovered during J.C. Harrington’s surveys in 1947 and 1948. The Central Excavation Area reexamined a linear soil stain that resembled fortification palisade slot trenches that have been discovered on early 17th-century Virginia sites. The West Excavation Area explored a line of possible postholes to determine if they were part of a domestic earthfast structure. Neither the linear soil stain nor the possible postholes proved to be 16th-century cultural features. The former is likely a 20th-century trench and the latter are treeholes. No artifacts were found in either area.

The complete absence of any evidence of the 16th-century forts or villages prompted a limited survey away from the immediate environs of the reconstructed earthen fort and toward the thickly wooded Nature Trail tract between the fort and the Elizabethan Gardens. This property had never been archaeological surveyed until the 1994 field season when a 5-ft. square test pit was excavated here and uncovered a cultural stratum beneath more than 2 ft. of sand. The black sandy loam contained 22 sherds of Indian pottery and numerous fragments of charcoal. All the pottery was identified by Dr. David Phelps as belonging to the Colington series whose temporal range includes the late 16th century.

The 1995 survey consisted of the excavation of a series of 1-ft. test holes out from the 1994 test pit to define the limits of the artifact-bearing layer as well as four larger test pits to recover additional artifacts and search for archaeological features in order to determine whether buried land surface contained evidence of 16th-century English occupation. While no features were uncovered, European artifacts were recovered from the black sand layer including two sherds of Spanish olive jar, a crucible sherd, a lead shot, delftware glaze, a fragment of an English tobacco pipe bowl, and a piece of a gunspall. Numerous sherds of Colington ceramics also were collected. All of this material could date to the late 16th century. Given many crucible sherds found during the 1991-1993 excavations of the metallurgical workshop of Joachim Gans, the crucible sherd likely is associated with the 1585 Lane settlement. While it is not known what occurred on this site, it appears that the thick sand layers have preserved a land surface that was used by the English during the time of the Roanoke settlements.
What can be learned from looking at the “big picture” formed by the three major archaeological campaigns at Fort Raleigh? Despite the 1980’s excavations by the NPS and the 1990’s work by the VCF, the answer is the same reached by J.C. Harrington at the end of his 1947-1950 archaeological project. In Harrington’s words “…conclusion from the explorations carried on thus far is that the habitation site has not been located (Harrington 1962:38).” Most Roanoke Island settlement researchers will go even further today, believing that neither the habitation site nor the fort of either the Lane Colony or the Lost Colony has been discovered. Harrington reached his conclusion in part by comparing his findings to a similarly short-lived French settlement, St. Croix. In view of the additional archaeology at Fort Raleigh and Fort St. George, it seems a useful comparison to revisit, particularly given that the Lane Colony, the Lost Colony, St. Croix, and Fort St. George are quite similar in many respects. All were settlements of nearly the same size (100-117 people), established generally at the same time (1585-1607), and each lasted about one year.

The first attempt to settle New France was on St. Croix Island, Maine. In June of 1604, 111 men under Sieur de Monts established a colony that was abandoned in June of 1605. John L. Cotter (1978) has summarized preliminary archaeological testing in 1950 by Wendell S. Hadlock (1950) and survey and area excavation in 1968-1969 by Jacob W. Gruber (1970). The total area excavated at the north end of the island is approximately 4000 ft.². The finds consist of 1015 ceramic sherds (some date to the 18th and 19th centuries, but the vast majority belong to the St. Croix period), 250 yellow clay brick bats, 452 glass fragments, 51 glass beads, 1005 complete or fragments of wrought nails, 5 musket balls, 5 lead shot, lead scrap, 99 copper-lead-iron objects, daub, bone, and pieces of flint.

The Virginia Company, a joint stock company with a charter to colonize North America, was divided into the London Company which established Jamestown and the less well known Plymouth Company that founded the Popham Colony on the Sagadahoc (now Kennebec) River in Maine. The Popham Colony began in August of 1607 when 100 settlers landed and set about constructing Fort St. George. Approximately half of colonists returned to England in December of the same year due to diminishing supplies, leaving 45 men at Fort St. George. The entire settlement was abandoned in September or October of 1608. Jeffrey P. Brain (1995) directed recent archaeological investigations at Fort St. George as well as reviewed earlier testing by Wendell S. Hadlock. Brain dug 51 excavation units totaling approximately 585 ft.². The excavations produced 732 ceramic sherds, 27 fragments of green glass, 2 glass beads, 54 tobacco pipe stem and bowl fragments dating to the Fort St. George period, at least 84 wrought nails, 5 musket balls, 2 lead shot, 5 sprue, lead scrap, a few pieces of copper sheet metal, a seal-top spoon, and a bale seal. Large quantities of daub and shell also were found, though much of the shell could be attributed to prior Native American occupation.

Harrington’s 1947-1948 testing west of the reconstructed earthwork excavated approximately 17,500 ft.² and recovered 2 nails, 3 lead musket balls, 5 crucible fragments, 3 olive jar sherds, 1 stoneware sherd, and 3 brick fragments. His subsequent excavation of the earthen fort interior and ditch in 1950 produced the following European artifact assemblage: 1 iron sickle, 1 iron auger, 10 iron spikes and 2 spike fragments, 3 nail fragments, 2 U-shaped iron objects, 1 12 in. long irons, 1 iron hinge of questionable date, 3 brass casting counters or jettons, 1 small brass balance weight, 2 copper nuggets, 2 lead musket balls, 1 glass bead, 22 Spanish olive jar sherds, 2 majolica sherds, a coarseware sherd, 1 brick fragment, and 1 roofing tile fragment (Harrington 1962). Harrington’s excavation of the “outwork” in 1965 resulted in the following collection: 25 sherds of Normandy stoneware representing one costrel, 4 whole bricks, pieces of 8-9 additional bricks, 20 altered brick pieces, approximately 3 roofing tiles, and sherds of Native American pottery (Har-
The 1982/83 NPS investigations adjacent to the entrance of the reconstructed earthwork excavated 1120 ft.² and found 38 European artifacts (Ehrenhard and Komara 1984), mostly sherds of crucibles, ointment pots, and Normandy flasks, all of which can be attributed to the 1585 science center. The 1991-1993 VCF excavations, all immediately west of the reconstructed earthwork, consisted of digging a minimum of 3000 ft.² and produced 119 pieces of crucible, 9 cupel fragments, 17 sherds of Maiolica ointment pot, 19 sherds of West of England butterpot, 136 sherds of Normandy flask, 2 sherds of Spanish jar, 25 fragments of bottle glass, 5 pieces of roofing tile, 119 sherds of Native American pottery, as well as 58 flint chips, 106 flakes of iron scale, 1 piece of lead waste, 1 bale seal, and 1 lump of antimony (Noel Hume 1995). The 1994 VCF survey excavated nearly 1000 ft.² in the immediate vicinity of the reconstructed earthwork, but away from the science center, and found no 16th-century artifacts.

The total area excavated at Fort Raleigh is about 20,000 ft.² (22,620 minus an allowance for some overlapping excavations) versus 4000 ft.² at St. Croix and 585 at Fort St. George. Yet, despite the vastly larger excavated area, the Fort Raleigh artifact assemblage significantly lacks a domestic component that is present at St. Croix and Fort St. George. Virtually all the artifacts recovered at Fort Raleigh by Harrington and Ehrenhard almost certainly were associated with the Gans/Hariot scientific workshop identified by the VCF and what is conspicuously absent is the refuse normally associated with European domestic sites. There are no pots, pans, pitchers, bones, or shells (Noel Hume 1995:63-64). There is also a striking shortage of architectural materials at Fort Raleigh in contrast to the large quantities of nails, brick, and daub seen at St. Croix and Fort St. George. The limited work at St. Croix and Fort St. George makes it quite plain that a site occupied for only one year by 100 people should have a lot of domestic artifacts, an idea proclaimed by Harrington (1984: 19) more than thirty years ago. This is simply not the case at Fort Raleigh. Consequently, the answer to another long-standing question at Fort Raleigh—how could so many colonists have left such a paucity of artifacts?—is that they didn’t because neither the fort or village was on the property immediately surrounding the reconstructed earthwork.

The reconstructed earthwork cannot have been a bastion for the 1585 Lane colony fort since it was the site of the scientific workshop of the same expedition. The dearth of domestic artifacts also strongly suggests that it is not the site of the 1587 White colony either. In fact, Noel Hume (1994:88) has asserted that the earthwork is of 18th-century vintage. However, there are two 16th-century interpretations that are still conceivable. One is that the earthen fort was built for the garrison left by Grenville in 1586 — not a new idea and one which has its detractors. The second possibility hinges upon the presence of science center artifacts inside the earthen fort and the fact that they were recovered from a disturbed context; thus it may be that the science center horizon did not extend under the earthen fort and that the fort (or sconce) was built to protect the science center much in the same way that the Lane colonists built earthen fortifications during a larcenous raid of Spanish salt mounds on Puerto Rico (Figure 22).

Figure 22: Earthwork contructed by Lane colonists on Puerto Rico (Hulton 1984).
ments are somewhat removed from the science center, then the necessity for the science center to have some form of individual protection becomes more credible.

There were two instances where 16th-century artifacts were recovered from excavations of the earthwork other than from the trench. Harrington (1962:21-22) found a nugget of copper, a sherd of an Iberian storage jar, and a musket ball under the remnant of the original parapet. These objects must be related to the establishment of the science center which therefore predated the construction of the earthwork. The artifacts, however, do not indicate when the earthwork was built, only that it was done sometime after the science center was set up. Nor were the artifacts definitively deposited within the walls of the workshop; they could simply have been part of the workshop midden. The same is true for the artifacts found inside the earthwork during the VCF excavations. Consequently, since the earthwork did not necessarily abolish the science center, it could have been built sometime after the science center was functioning and before the Lane Colony was abandoned. Although the science center was unknown to him at the time, Harrington (1962:53) speculated that the earthwork could have been constructed in the spring of 1586 when the English-Indian relationship became increasingly hostile. David Stick (1993), building on Harrington's conjecture, has suggested that the earthwork was built to protect the science center from the same threat. A small earthwork can be erected expeditiously and cheaply— the comparable earthwork encircling the Puerto Rican salt mounds was built quickly with 31 men in approximately two days (Quinn 1991:184-185).

The 1994-95 archaeological work at Fort Raleigh NHS reinforced the findings and conclusions of the 1991-93 VCF excavations led by Noël Hume, namely the remains of the 1585/1587 forts and villages are not located within the immediate surroundings of the reconstructed earthwork. Noël Hume has advised that archaeologists are now free to search other areas for evidence of the Roanoke settlements (Noël Hume 1994: 88). Of course, one unhappy prospect of this situation is that erosion has completely consumed the sites (Dolan and Bosserman 1972; Dolan, Hayden, and Bosserman 1981). However, all possible alternatives should be reviewed, including areas previously surveyed in the 1940’s.
Future Research

There still is potential for future archaeological research related to the science center. The Native American/16th-century artifact scatter located during the 1995 survey is one such location. The survey demonstrated that the limits of the scientific workshop and associated areas are more widespread than previously believed. While the crucible fragment from FRER103 seemingly links this area 400 ft. west of the reconstructed earthwork to the scientific workshop, the two are separated by a substantial artifact gap manifested by the 1994 West Excavation Area, implying that the FRER103 vicinity is a related but detached element. One possible explanation is that it is an undiscovered workshop component, perhaps a house near the scientific workshop (Noel Hume 1995:107).

The vicinity of Harrington's charcoal-filled pit is also worthy of additional investigation (Noel Hume 1995:83). While making charcoal in a pit is an unusual method, there is 16th-century precedent for doing so (Figure 23), although how the charcoal was made at the site remains an open question (Noel Hume 1995:81). Regardless of whether the charcoal was made in the pit or not, carbon-14 dating indicated that the charcoal dated to the late 16th-century. This strengthens the apparent connection between the science center and the pit since Gans' assay furnaces surely were fueled with charcoal, and it is therefore possible that there are additional science center features present.

Figure 23: 1540 engraving of making charcoal in a pit (Biringuccio 1966: 178).
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# Appendix A

## Finds List

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<td>Pebble</td>
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<td>Delftware glaze chips (white with blue dots)</td>
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<td>ER104D</td>
<td>Prehistoric pottery</td>
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<td>Sand concretion</td>
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