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*** START OF THE PROJECT GUTENBERG EBOOK NEW DISCOVERIES AT JAMESTOWN ***



New Discoveries at JAMESTOWN

*Site of the First Successful
English Settlement in America*

By JOHN L. COTTER and J. PAUL HUDSON

WASHINGTON, D. C., 1957



UNITED STATES DEPARTMENT OF THE INTERIOR
Fred A. Seaton, *Secretary*

NATIONAL PARK SERVICE
Conrad L. Wirth, *Director*



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Preface

JAMESTOWN, a name of first rank among historic names, saw the birth of English America. Here on an island in the James River in the heart of tidewater Virginia the English carved a settlement out of the wilderness. It grew from a rude palisaded fort into a busy community and then into a small town that enjoyed many of the comforts of daily living. For 13 years (until 1620) Virginia was the only English colony on the American mainland. Jamestown served this colony as its place of origin and as its capital for 92 years—from 1607 to 1699.

After its first century of prominence and leadership, "James Towne" entered a long decline, precipitated, in 1700, by the removal of the seat of government to Williamsburg. Its residents drifted away, its streets grew silent, its buildings decayed, and even its lots and former public places became cultivated fields. Time passed and much was forgotten or obscured. So it was when it became a historic area, in part, in 1893, and when the whole island became devoted to historical purposes in 1934.

Since these dates, the Association for the Preservation of Virginia Antiquities and the National Park Service have worked toward the preservation of all that still exists of old Jamestown, and are dedicated to learning its story more completely. Thus the American people can more fully understand and enjoy their historic heritage of Jamestown. A great deal of study along many lines has been required and much more is still needed to fill the many gaps. Libraries have been searched for pictures, documents, and plans. Land records have been carefully scrutinized and old existing landmarks studied. Seventeenth-century buildings and objects still surviving in England, America, and elsewhere have been viewed as well as museum collections. A key part of the search has been the systematic excavation of the townsite itself, in order to bring to light the information and objects long buried there. This is the aspect of the broad Jamestown study that is told in this publication, particularly as it relates to the material things, large and small, of daily life in Jamestown in the 17th century.

These valuable objects are a priceless part of the Jamestown that exists today. Collectively they form one of the finest groups of such early material that has been assembled anywhere. Although most are broken and few are intact, they would not be traded for better preserved and more perfect examples that do exist elsewhere. These things were the property and the possessions of the men and women who lived, worked, and died at Jamestown. It was because of these people, who handled and used them in their daily living, and because of what they accomplished, that Jamestown is one of our best remembered historic places.

April 6, 1956

CHARLES E. HATCH, JR.
Colonial National Historical Park

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JAMESTOWN ISLAND, VIRGINIA. ON THIS SMALL ISLAND—HALF FOREST AND HALF MARSH—WAS PLANTED THE ENGLISH COLONY OF WHICH RALEIGH AND GILBERT DREAMED.

PART ONE

Exploration: The Ground Yields Many Things

By JOHN L. COTTER

Supervising Archeologist, Colonial National Historical Park

"As in the arts and sciences the first invention is of more consequence than all the improvements afterward, so in kingdoms, the first foundation, or plantation, is of more noble dignity and merit than all that followeth."

—LORD BACON

IN THE SUMMER of 1934 a group of archeologists set to work to explore the site of the first permanent English settlement at Jamestown Island, Va. For the next 22 years the National Park Service strove—with time out for wars and intervals between financial allotments—to wrest from the soil of Jamestown the physical evidence of 17th-century life. The job is not yet complete. Only 24 out of 60 acres estimated to comprise "James City" have been explored; yet a significant amount of information has been revealed by trowel and whiskbroom and careful recording.

By 1956 a total of 140 structures—brick houses, frame houses with brick footings, outbuildings, workshops, wells,

kilns, and even an ice storage pit—had been recorded. To help unravel the mystery of landholdings (sometimes marked by ditches), 96 ditches of all kinds were located, and hundreds of miscellaneous features from post holes to brick walls were uncovered. Refuse pits were explored meticulously, since before the dawn of history man has left his story in the objects he discarded.

When archeology at Jamestown is mentioned, the question is often asked, why was it necessary to treat so famous a historic site as an archeological problem at all? Isn't the story finished with the accounts of John Smith's adventures, the romance of John Rolfe and Pocahontas, the "starving time," the Indian massacre of 1622, Nathaniel Bacon's rebellion against Governor Berkeley, and the establishment of the first legislative assembly?

The archeologist's answer is that the real drama of daily life of the settlers—the life they knew 24 hours a day—is locked in the unwritten history beneath humus and tangled vegetation of the island. Here a brass thimble from the ruins of a cottage still retains a pellet of paper to keep it on a tiny finger that wore it 300 years ago. A bent halberd in an abandoned well, a discarded sword, and a piece of armor tell again the passing of terror of the unknown, after the Indians retreated forever into the distant hills and forests. Rust-eaten axes, wedges, mattocks, and saws recall the struggle to clear a wilderness. The simple essentials of life in the first desperate years have largely vanished with traces of the first fort and its frame buildings. But in later houses the evidence of Venetian glass, Dutch and English delftware, pewter, and silver eating utensils, and other comforts and little luxuries tell of new-found security and the beginning of wealth. In all, a half-million individual artifacts at the Jamestown museum represent the largest collection from any 17th-century colonial site in North America.

But archeologists have found more than objects at Jamestown. They sought to unravel the mystery of that part of the first settlement which disappeared beneath the eroding current of the James River during the past 300 years. It has always been known that the island in the 17th century was connected to the mainland by a narrow isthmus extending to Glasshouse Point, where a glassmaking venture took place in 1608. Over this isthmus the "Greate Road" ran, and its traces have been discovered on the island as far as the brick church tower. As the isthmus disappeared at the close of the 17th century, the river continued to erode the island headward and build it up at its downstream end, so that the western and southern shores where the first settlement had been built, were partly destroyed. Thus, the first fort site of 1607, of which no trace has been found on land, is thought to have been eaten away, together with the old powder magazine and much early 17th-century property fronting on the river.

In a series of extensive tests for any possible trace of the 1607 fort still remaining on land, several incidental discoveries of importance were made. One was an Indian occupation site beneath a layer of early 17th-century humus, which, in turn, was covered by the earthen rampart of a Confederate fort of 1861. This location is marked today by a permanent "in-place" exhibit on the shore near the old church tower. Here, in a cut-away earth section revealing soil zones from the present to the undisturbed clay, evidence of 350 years of history fades away into prehistory.

Within the enclosure of this same Confederate fort was found a miraculously preserved pocket of 17th-century debris marking the site of the earliest known armorer's forge in British America.

Just beyond, upriver, lie ruins of the Ludwell House and the Third and Fourth Statehouses. In 1900-01, Col. Samuel H. Yonge, a U.S. Army Engineer and a keen student of Jamestown history, uncovered and capped these foundations after building the original seawall. A strange discovery was made here in 1955 while the foundations were being examined by archeologists for measured drawings. Tests showed that no less than 70 human burials lay beneath the statehouse walls, and an estimated 200 more remain undisturbed beneath the remaining structures or have been lost in the James River. Here may be the earliest cemetery yet revealed at Jamestown—one so old that it was forgotten by the 1660's when the Third Statehouse was erected. It is, indeed, quite possible that these burials, some hastily interred without coffins, could date from the "starving time" of 1609-10, when the settlers strove to dispose of their dead without disclosing their desperate condition to the Indians.



JAMESTOWN EXPLORATION TRENCHES OF 1955 FROM THE AIR. LANDMARKS ARE THE "OLD CYPRESS" IN THE RIVER, UPPER LEFT, THE TERCENTENARY MONUMENT, AND THE STANDING RUIN OF THE 18TH-CENTURY AMBLER HOUSE.

The highlight of archeological discoveries at Jamestown is undoubtedly the long-forgotten buildings themselves, ranging from mansions to simple cottages. Since no accurate map of 17th-century "James City" is known to survive, and as only a few land tracts, often difficult to adjust to the ground, have come down to us, archeologists found that the best way to discover evidence was to cast a network of exploratory trenches over the area of habitation.

During its whole century of existence, the settlement was never an integrated town. The first frame houses quickly rotted away or succumbed to frequent fires. Brick buildings were soon erected, but probably not twoscore ever stood

at one time during the 17th century.

Bearing in mind that the massive church tower is the only 17th-century structure remaining above ground today, and the only building whose identity was therefore never lost, you will find only one other identified with positive assurance—the Ludwell House—Third and Fourth Statehouses row. The remaining 140 structures so far discovered by excavating have no clear-cut identity with their owners. To complicate matters more, bricks from many burned or dismantled houses were salvaged for reuse, sometimes leaving only vague soil-shadows for the archeologist to ponder. From artifacts associated with foundation traces, relative datings and, usually, the use of the structure can be deduced from physical evidence. Unless a contemporaneous map is someday found, we shall know little more than this about the houses at Jamestown except for the testimony of assorted hardware, ceramics, glassware, metalware, and other imperishable reminders of 17-century arts and crafts.

Churches

The first church service at Jamestown was held under a piece of sailcloth in May 1607. The first frame church, constructed within the palisades, burned with the entire first fort in January 1608, and was eventually replaced by another frame structure after the fort was rebuilt. The exact date of the first church to stand on a brick foundation is uncertain, possibly 1639. Brick foundation traces, uncovered in 1901 by John Tyler, Jr., a civil engineer who volunteered his services for the Association for the Preservation of Virginia Antiquities, lie behind the free-standing brick church tower which remains the only standing ruin today. The modern brick structure and roof enclose and protect the footing evidence of the walls of two separate churches and a tile chancel flooring. Indication of fire among these foundations was noted by Tyler.



A MANSION STRUCTURE OR PUBLIC BUILDING DATING FROM THE SECOND QUARTER OF THE 17TH CENTURY. REBUILT ONCE AND BURNED ABOUT THE TIME OF BACON'S REBELLION, 1676.

Mansions

Despite official urgings that they build substantial town houses on Jamestown Island, the first successful planters often preferred to build on their holdings away from the capitol, once the Indian menace had passed. Only 2 houses at Jamestown, designed for single occupancy, have over 900 square feet of foundation area.

One was either a stately residence or a public building (area 1,350 square feet) located near Pitch and Tar Swamp, just east of the Jamestown Visitor Center. Archeological evidence indicates that this structure was first completed before the middle of the 17th century. It was later reconstructed and enlarged about the beginning of the last quarter, possibly during Bacon's Rebellion of 1676. Unmistakably, it burned.

The second structure was a smaller (1,200 square feet), but imposing, house located near the present shoreline, considerably downriver. One of the features of this second mansion was a basement in the center of which was sunk a square, brick-lined recess, 3.3 feet on a side and 2.7 feet deep. Among the many wine bottle fragments in this recess were 3 bottle seals—1 with "WW" and 2 with "FN" stamped on them. Whether or not this mansion can be associated with Sir Francis Nicholson, the last governor resident at Jamestown (who moved the capital to Williamsburg), we do not know. Artifacts found in the refuse indicate this house was dismantled, not burned, shortly before or after the turn of the 17th century. The mystery of the little brick-lined recess is not entirely solved, but it is probable that here was a primitive cooler, deep below the house, in which perishable foods or wines were stored.



JAMESTOWN HOUSE TYPES: SIMPLE FRAME, HALF-TIMBER, BRICK, AND ROW. (Conjectural sketches by Sidney E. King.)



EXCAVATED FOUNDATION OF A LATE 17TH-CENTURY PROTOTYPE OF THE BALTIMORE AND PHILADELPHIA ROW HOUSES. SIX FAMILIES COULD HAVE LIVED HERE.

Row Houses

Although row houses—a continuous row of joined family residences on unit foundations—were a common city feature in 17th-century England, apparently they did not become popular at Jamestown. But the brick foundation of one true multiple-family unit has been uncovered, and two others approach this category, thus providing the true precedent for the row houses which came to characterize miles of Baltimore and Philadelphia streets, and are a familiar pattern of some modern duplex apartment units.

This Jamestown row house is probably the most impressive foundation on the island. It is 16 feet long and 20 feet wide (inside measurement), situated east of the Tercentenary Monument, facing south, well back from the river and “the back streete.” A cellar and a great fireplace terminate the east end, and 9 other fireplaces are evident in 4 main divisions, which may have housed one family or more in each division. Since artifact evidence relates it to the last quarter of the 17th century, and possibly the beginning of the 18th, there would seem little possibility of the row house having served as a public building or a tavern. There is some evidence that at least part of the structure burned.

Two other foundations might be classed as row houses, but are less clearly delineated. One is the Last Statehouse Group of five units in the APVA grounds. [11] The other multiple house is a 3-unit building midway between the brick church and Orchard Run. This structure generally fits the description of the First Statehouse in its 3-unit construction and dimensions, and has long been thought to be the original Statehouse building. The structure, however, is as close to the present shoreline as the First Statehouse is recorded to have been in 1642—a puzzling coincidence, if the factor of erosion is taken into consideration.

Single Brick Houses

These were once supposed to have been very common at Jamestown, but are represented by only 12 foundations, not all of which have been completely excavated. Like the other excavated structures, if these houses can be related to the ownership of the land tracts on which they once stood, we may someday know more of their possible identity.

Frame Houses

Partial or even whole brick footings do not always indicate brick houses at Jamestown. Some 30 structures have been recorded which had brick footings or isolated brick fireplace foundations, the appearance of which suggests frame houses. These may be briefly classified as follows:

Brick, or brick-and-cobble, wall-footings with central chimney bases of brick—2.

Brick footing and outside chimney—3.

Brick footing only—10.

Brick chimney base alone remaining—12.

Stone footing only—1.

Cellar only, presumed to belong to frame or unfinished house, or to have had all bricks salvaged—1.

Burned earth floor area only remaining, presumed to mark a frame house—1.

Some of the structures encountered in the first explorations remain to be more fully excavated and recorded. Structures in this category total 23.

Miscellaneous Structures

Because of the inadequacy of Jamestown remains and records, it is difficult to determine the purposes for which the various outbuildings were used. Doubtless, many outbuildings did exist for various purposes, and probably most of them were not substantial enough to leave a trace. Two clearly isolated, small structures properly called outbuildings (discovered in 1955) are all that will be cited here. The first is the large double-chimney foundation just beyond the southwest corner of the mansion east of the museum. Undoubtedly this belonged to a detached kitchen. The second is a small, but thick-walled, rectangular structure of brick which may have been a food storehouse or even a powder



ALTHOUGH MOST JAMESTOWN WORKSHOPS WERE PROBABLY MADE OF FRAMEWORK AND WERE MERELY SHEDS, ONE BRICK FOUNDATION HAS THREE BRICK FIREBOXES AND A LARGE BRICK CHIMNEY. THIS STRUCTURE WAS PROBABLY A BREW HOUSE, BAKERY, OR DISTILLERY.

Workshop Structures

Most of the early industries at Jamestown were undoubtedly housed in perishable wooden structures that have left the least evident traces, such as frame sheds for forges and wine presses, carpenters' shops, and buildings used by various artisans and craftsmen. So far, only two industrial structures are clearly recognizable (aside from kilns), although their precise use is not certain.

One of these, on the edge of Pitch and Tar Swamp, was a nearly square, tile-floored workshop with a rough but substantial brick foundation supporting the framework of the walls. On the floor were 3 fireboxes, 2 of which were associated with a large chimney area. What was fabricated here has not yet been determined, although ceramic firing, brewing, distilling, and even ironworking, have been suggested. Proximity of pottery and lime-burning kilns, and a small pit where iron may have been smelted, may be significant.

A second, very fragmentary brick foundation close to the present riverbank suggests a shop rather than a house, but lacks firebox evidence or other identifying features. It may be 18th- rather than 17th-century.



NEAR THE FOUNDATION OF THE PROBABLE BAKE SHOP, A PAIR OF KILNS ONCE SERVED FOR SLAKING LIME, AND PERHAPS FOR FIRING POTTERY. BETWEEN THE KILNS WAS A FLAME-SCARRED PIT CONTAINING EVIDENCE OF IRONWORKING AND THE ROASTING OF BOG ORE FOR IRON.

Brick Walks or Paved Areas

It is difficult to assign a use for certain areas which have been paved apparently with brick rubble, or, in more evident cases, by flatlaid bricks. Four such paved areas have been discovered.

Brick Drains

Three brick drains, buried beneath the humus line, are identified with 17th-century houses.

Ice Storage Pit

So far unique on Jamestown Island is a circular unlined pit, 14 feet in top diameter, excavated 7 feet into a sandy substratum, and corresponding in general character to known 17th- and 18th-century ice pits in England. This pit which lies 250 feet east of the Visitor Center may have served a spacious house which once stood nearby. It may be assumed that the missing surface structure was circular, probably of brick, had a small door, and was roofed over with thatch or sod for insulation.

Kilns

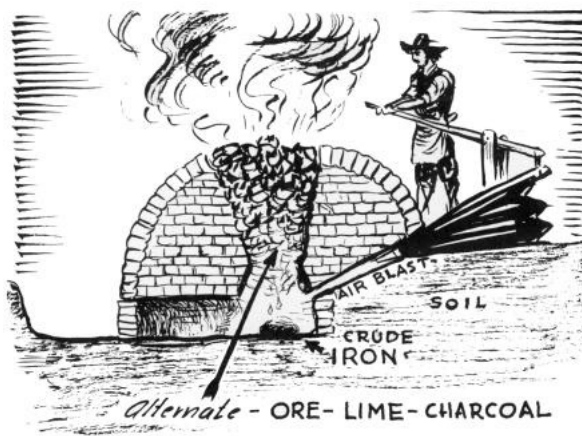
Both brick and lime kilns are present in the "James City" area, each type being represented by four examples. The oldest of four brick kilns so far discovered on the island is a small rectangular pit near Orchard Run, excavated to a floor depth of 4 feet, which has been dated between 1607 and 1625 by associated cultural objects. This small pit, without structural brick, was a brick-making "clamp," consisting of unfired brick built up over two firing chambers. There is good evidence that a pottery kiln was situated 30 feet west of the "industrial area."

Ironworking Pits

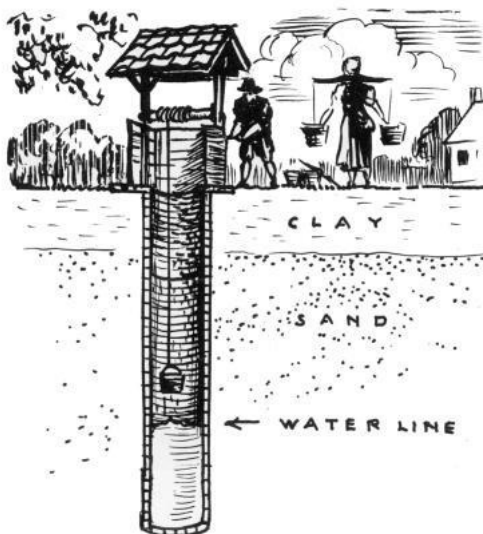
Also in the "industrial area" near Pitch and Tar Swamp, there is a circular pit in which lime, bog iron, and charcoal suggest the manufacture of iron. The previously mentioned pit within the area of the Confederate Fort yielded sword parts, gun parts, bar iron, and small tools, indicating a forge site, perhaps an armorer's forge.



MAKING POTTERY AT JAMESTOWN. (Conjectural sketch by Sidney E. King.)



HOW AN IRONWORKING PIT WAS USED. (From contemporary sources.)



CROSS SECTION OF A BRICK-CASED WELL AT JAMESTOWN. (Conjectural sketch by Sidney E. King.)



ONE OF THE INTRIGUING MYSTERIES OF JAMESTOWN IS HOW THE LEFT LEG AND LEFT HALF OF A HUMAN PELVIS CAME TO BE THROWN WITH OTHER REFUSE INTO A WELL BEHIND THE ROW HOUSE. THE LOGICAL INFERENCE IS THAT A REBEL OR CRIMINAL HAD BEEN HANGED, DRAWN, AND QUARTERED.

Wells

At Jamestown, wells are conspicuous features near many house locations. Those that have been found may be summarized as follows: wood lined—1; circular, brick cased—10; circular, uncased with wooden barrel at bottom—6; circular, uncased, incompletely excavated—4.

Wells are invariably found filled with earth mixed with trash, mainly food animal bones. A well, located immediately north of the row house, had a human left leg and left half of the pelvis buried in the fill at a depth of 4 feet.

Ditches

The most significant feature determining landholdings are the ditches of the Jamestown area. During the 1954-56 explorations 63 ditches were added to the 33 previously discovered, thus increasing the opportunity to delineate property lines, many of which used to be bounded by such ditches.



CAREFUL EXCAVATION WAS REQUIRED TO IDENTIFY THE FILL OF LONG-ABLITERATED DITCHES ONCE DRAINING FIELDS AND MARKING PROPERTY BOUNDARIES.

Refuse Pits

“James Citty,” like all other settlements in all ages, had to have places for disposal of refuse. That much refuse was disposed of by casting it in the James River is unlikely, since before the dawn of history it has been a trait of man to live on top of his own refuse rather than litter a shore with it. While it may be that no pits were dug purposely for refuse disposal, pits opened for brick or ceramic clay (or dug for ice houses, wells, or other purposes and later abandoned) were used for dumping trash. In 1955 a refuse pit almost 40 feet square was discovered in the “industrial area” near the workshop, ironworking pit, and pottery kilns. Filled with trash from the first half of the 17th century, this pit contained such artifacts as a sweepthilt rapier (made about 1600), a cutlass, the breastplate and backpiece of a light suit of armor, a number of utensils of metal, ceramics, and glass, to add to the collection of early 17th-century arts and crafts. Several smaller refuse pits were noted, and it is worth commenting that many ditches finally became trash accumulation areas.



A CUTLASS IN EXCELLENT PRESERVATION AND MANY OTHER OBJECTS FROM 17TH-CENTURY JAMESTOWN WERE FOUND IN A LARGE CLAY BORROW PIT FILLED WITH REFUSE.

Roads

Only one road identified by 17th-century references has been definitely located by archeologists. This is the “Maine Cart Road,” sometimes called the “Greate Road,” leading from Glasshouse Point across the isthmus and onto the island, where it can be traced as far as its passage into the main “James Citty” area just north of the brick church and churchyard. A trace is all that remains of a road which once ran east-west between parallel ditches, south of the row house.

The foregoing has been a summary of the physical aspect of the Jamestown settlement from the standpoint of archeology. An account of the arts and crafts revealed by the artifacts found in these explorations follows. The whole story relating the settlers themselves to evidence they left in the soil of Jamestown remains to be told.

PART TWO

Daily Life at Jamestown 300 Years Ago As Revealed by Recovered Objects

By J. PAUL HUDSON

Museum Curator, Colonial National Historical Park

“Hitherto they [historians] have depended too much upon manuscript evidences... Perhaps the day is not distant when the social historian, whether he is writing about the New England Puritans, or the Pennsylvania Germans, or the rice planters of Southern Carolina, will look underground, as well as in the archives, for his evidence.”—DR. T.J. WERTENBAKER

ARCHEOLOGICAL EXPLORATIONS at Jamestown, Va.—site of the first successful English colony in the New World—have brought to light thousands of colonial period artifacts which were used by the Virginia settlers from 1607 until 1699.

A study of these ancient objects, which were buried under the soil at Jamestown for many decades, reveal in many ways how the English colonists lived on a small wilderness island over 300 years ago. Artifacts unearthed include pottery and glassware, clay pipes, building materials and handwrought hardware, tools and farm implements, weapons, kitchen utensils and fireplace accessories, furniture hardware, lighting devices, eating and drinking vessels, tableware, costume accessories and footwear, medical equipment, horse gear, coins and weights, and many items relating to household and town industries, transportation, trade, and fishing.

These artifacts provide invaluable information concerning the everyday life and manners of the first Virginia settlers. A brief description of many of them is given on the following pages.

Excavated artifacts reveal that the Jamestown colonists built their houses in the same style as those they knew in England, insofar as local materials permitted. There were differences, however, for they were in a land replete with vast forests and untapped natural resources close at hand which they used to advantage. The Virginia known to the first settlers was a carpenter’s paradise, and consequently the early buildings were the work of artisans in wood. The first rude shelters, the split-wood fencing, the clapboard roof, puncheon floors, cupboards, benches, stools, and wood plows are all examples of skilled working with wood.

Houses

Timber at Jamestown was plentiful, so many houses, especially in the early years, were of frame construction. During the first decade or two, house construction reflected a primitive use found ready at hand, such as saplings for a sort of framing, and use of branches, leafage, bark, and animal skins. During these early years—when the settlers were having such a difficult time staying alive—mud walls, wattle and daub, and coarse marshgrass thatch were used. Out of these years of improvising, construction with squared posts, and later with quarterings (studs), came into practice. There was probably little thought of plastering walls during the first two decades, and when plastering was adopted, clay, or clay mixed with oyster-shell lime, was first used. The early floors were of clay, and such floors continued to be used in the humbler dwellings throughout the 1600's. It can be assumed that most of the dwellings, or shelters, of the Jamestown settlers, certainly until about 1630, had a rough and primitive appearance.

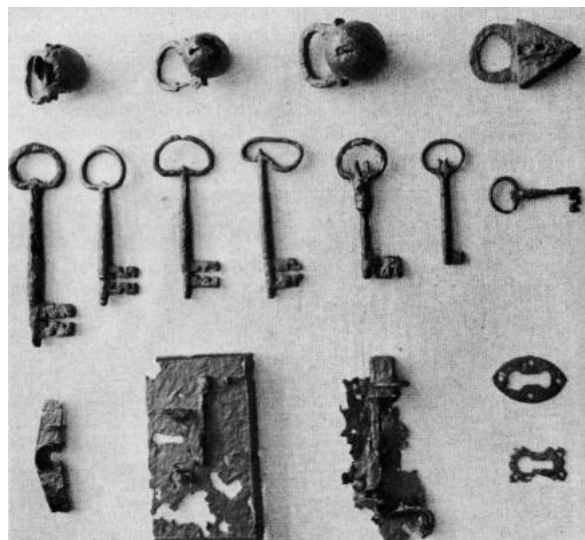
After Jamestown had attained some degree of permanency, many houses were built of brick. It is quite clear from documentary records and archeological remains, that the colonists not only made their own brick, but that the process, as well as the finished products, followed closely the English method. Four brick kilns were discovered on Jamestown Island during archeological explorations.



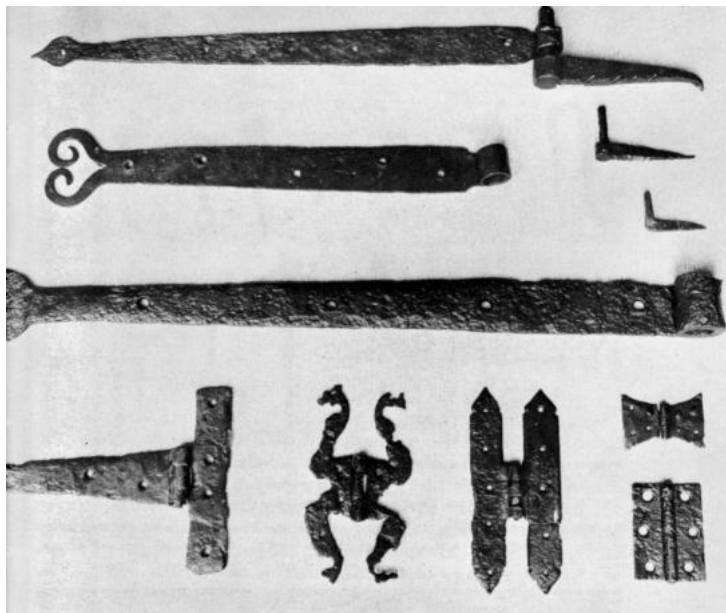
AN EARLY JAMESTOWN HOUSE. (Conjectural sketch by Sidney E. King.)



A BRICK HOUSE AT JAMESTOWN, ABOUT 1640. (Conjectural sketch by Sidney E. King.)



THE MAJORITY OF THE LOCKS AND KEYS USED IN THE EARLY HOUSES WERE IMPORTED FROM ENGLAND.



A FEW 17TH-CENTURY HANDWROUGHT HINGES IN THE JAMESTOWN COLLECTION.

BUILDING HARDWARE

While some of the handwrought hardware found at Jamestown was made in the colony, most of it was imported from England. Types of building hardware unearthed include an excellent assortment of nails, spikes, staples, locks, keys, hinges, pintles, shutter fasteners, bolts, hasps, latches, door knockers, door pulls, footscrapers, gutter supports, wall anchors, and ornamental hardware. In many instances each type is represented by several varieties. Citing 2 examples, there are more than 20 kinds of nails and at least 15 different kinds of hinges in the collection.



SOME NAILS, SPIKES, STAPLES, AND OTHER IRON HARDWARE USED AT JAMESTOWN OVER 300 YEARS AGO.



SOME JAMESTOWN HOUSES HAD LEADED GLAZED WROUGHT-IRON WINDOW CASEMENTS SIMILAR TO THE ONES SHOWN HERE. (Courtesy, The Metropolitan Museum of Art, New York.)

It is believed that wooden hardware was used on many of the early houses.

WINDOWS

A few glass window panes may have been made in the Jamestown glass factory which was built in 1608. Most of the window glass used in the colony, however, was shipped from England. Many of the early panes used were diamond-shaped (known as "quarrels"), and were held in place by means of slotted lead strips (known as "comes"). The window frames used in a few of the Jamestown houses were handwrought iron casements. Most of the humbler dwellings had no glass panes in the windows. The window openings were closed by batten shutters, operated by hinges of wood and fitted with wooden fastening devices.

WALL AND FIREPLACE TILE

Most of the hand-painted tiles used at Jamestown (for decorating walls and fireplaces) were imported from Holland.

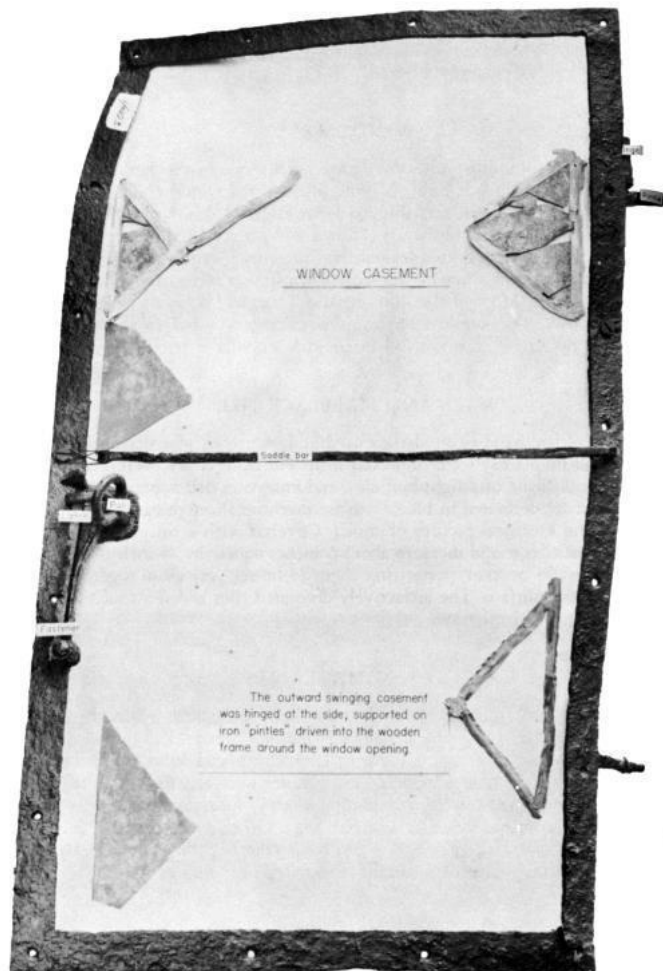
A few were made in England. Made of a light-buff clay, and known as delftware, the tiles unearthed are decorated in blue, with a conventionalized design in each corner and a central picture or motif. Covered with a tin glaze, the majority of tiles found measure about 5 inches square by $\frac{3}{8}$ -inch thick. The edges are beveled, permitting them to be set very close together at the glazed surface. The attractively decorated tiles added a touch of beauty to a few Jamestown interiors.

ROOFING MATERIALS

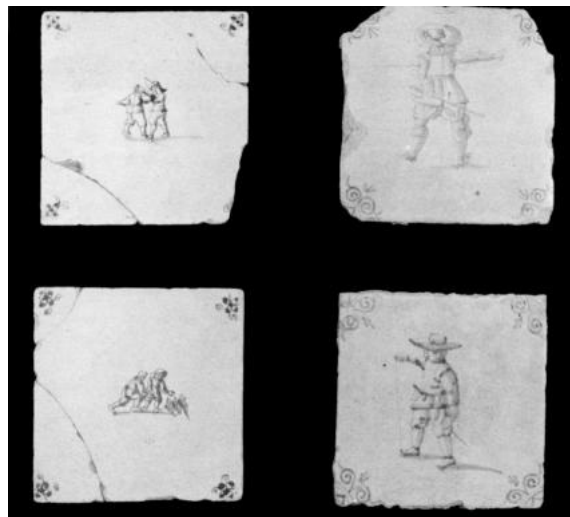
Four kinds of roofing materials have been excavated: Plain, flat, earthenware tiles; curved earthenware pantiles; slate; and wooden shingles. The plain tiles were made in Jamestown brick kilns, and it is possible that some of the S-curved red pantiles were also made locally. Slate was brought over from England, whereas most of the shingles were rived from native cedar and oak logs. Other materials used in roofing included bark, marshgrass and reeds (thatch), and boards. Sod appears to have been used on some of the very early houses.

LIME

Lime for mortar, plaster, and ornamental plaster was made in crude lime kilns at Jamestown from calcined oyster shells. The oyster shells came from the James River.



A WROUGHT-IRON WINDOW CASEMENT UNEARTHED NEAR AN EARLY 17TH-CENTURY BUILDING SITE.



WALL OR FIREPLACE TILES FOUND AT JAMESTOWN WHICH WERE MADE IN HOLLAND. THE BLUE DESIGNS AND PICTURES WERE PAINTED ON A WHITE BACKGROUND.



KINDS OF ROOFING MATERIALS EXCAVATED INCLUDE FLAT TILES (SHOWN HERE), CURVED PANTILES, SLATE, AND SHINGLES.



ORNAMENTAL PLASTER WAS USED IN A FEW BUILDINGS FOR ENHANCING THE BEAUTY OF BOTH THE INTERIOR AND EXTERIOR.



THE INTERIOR OF A SMALL JAMESTOWN HOUSE, ABOUT 1650. ALTHOUGH THE PAINTING IS CONJECTURAL, MANY ITEMS SHOWN—POTTERY, GLASSWARE, FIREPLACE TOOLS, AND KITCHEN ACCESSORIES—WERE UNEARTHED ON THIS HISTORIC ISLAND. (Painting by Sidney E. King.)

PLASTER AND MORTAR

Plaster and mortar have been found at Jamestown in abundance. It appears that the majority of brick houses and many frame structures had plastered walls and ceilings after 1635. Some plaster found had been whitewashed, while other plaster bore its natural whitish-gray color. Mortar was found wherever brick foundations were located. The plaster and mortar used at Jamestown was made from oystershell lime, sand, and clay.

ORNAMENTAL PLASTERWORK

Ornamental plaster was found in a few of the excavations. The plasterwork was done in raised ornamental designs used for enhancing the beauty of both the interior and exterior of a building. Designs that have been found include Roman numerals, letters, mottos, crests, veined leaves, rosettes, flowers, geometric designs, a lion, and a face or mask. Many fragments of molded plaster cornices have also been excavated. Broken oyster shells are distinguishable in the decorated plasterwork, indicating that the pargeting was done at Jamestown.

House Furnishings

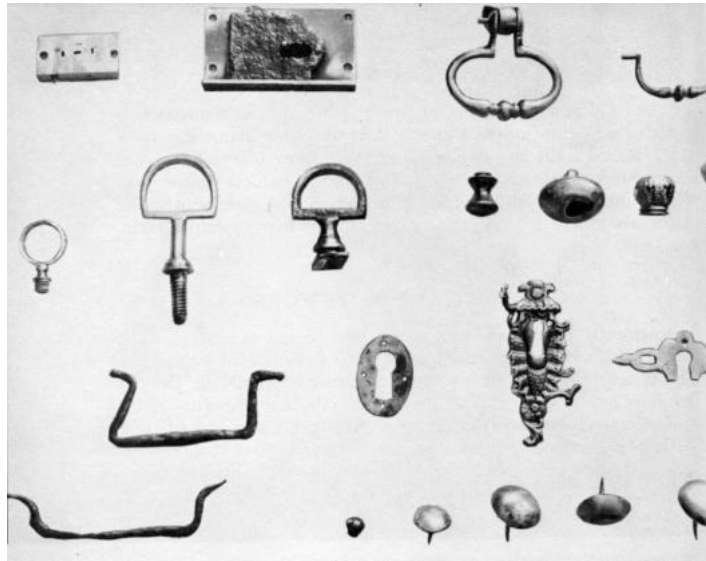
Busy conquering a stubborn wilderness, the first Jamestown settlers had only a few things to make their houses cosy and cheerful. In most cases, their worldly goods consisted of a few cooking utensils, a change of clothing, a weapon or two, and a few pieces of homemade furniture. However, between 1607 and 1612, George Percy was generously outfitted with some necessities as well as much fine apparel and numerous luxury items (including a feather bed) by his brother the Ninth Earl of Northumberland, as published records of the Earl's expenditures for George show. Other persons of gentle birth and position quite probably enjoyed similar goods.

After the early years of hardship had passed, the colonists began to acquire possessions for a more pleasant living;

and by 1650 the better houses were equipped with most of the necessities of life of those times, as well as a few luxuries of comfortable living.

FURNITURE

Very little furniture was brought over from England during the early years of the colony. Perhaps a few chests and Bible boxes were imported, but most of the large pieces of furniture, such as tables, chairs, bedsteads, chests-of-drawers, cupboards, benches, and cradles would have been made in Virginia. Woods commonly used included pine, cedar, walnut, maple, and oak.



FURNITURE HARDWARE AND ACCESSORIES FOUND. MUCH OF THE FURNITURE USED IN THE JAMESTOWN HOUSES WAS MADE IN VIRGINIA.

Furniture hardware and accessories excavated at Jamestown include hinges, locks, drawer pulls, chest handles, escutcheon plates, upholstery tacks, hasps, and finials. Most of the furniture hardware is of brass (probably used after 1650). Since much of it is skillfully decorated, it is believed that it once was attached to furniture of high quality. Furniture used during the first two decades of the settlement, however, must have been simple with little or no ornamentation.

LIGHTING DEVICES

The candle, made of either tallow or bayberry wax, was the standard lighting device at Jamestown. Pine torches were often used out of doors, and rushlights and candlewood were undoubtedly used in the humbler dwellings during the very early years of the settlement. Candlesticks unearthed at Jamestown include a large brass pricket holder, one made of English sgraffito-ware, several incomplete earthenware holders, and parts of delftware candlesticks. Many fragments of brass and iron candlesticks, as well as a few candle snuffers, have also been recovered.

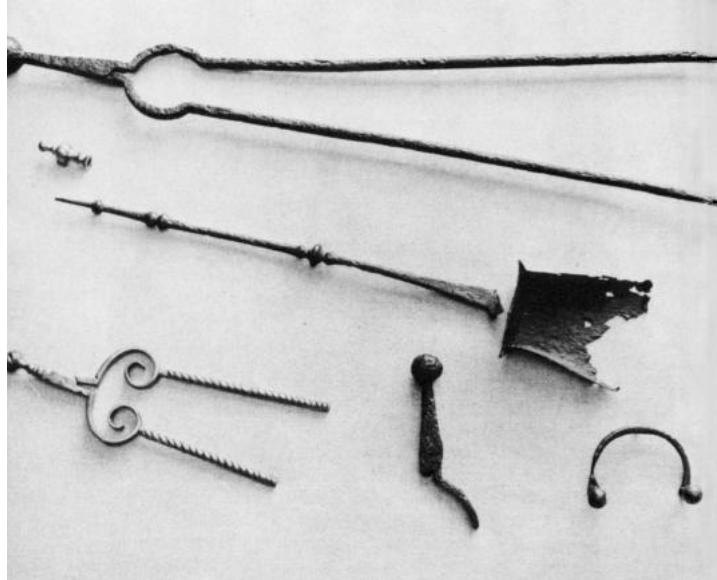


BOTH BRASS AND POTTERY CANDLESTICKS HAVE BEEN FOUND. THE CANDLE WAS THE STANDARD LIGHTING DEVICE DURING THE 17TH CENTURY.

FIREPLACE ACCESSORIES

The fireplace, around which the family gathered, was one of the most important features in the Jamestown home. Its fire offered warmth in winter, afforded light at night, and cooked the family meals during the day. An oven, usually found at the back or at one side of the fireplace, baked the family bread and other foods. About the fireplace, many home chores were carried out, including spinning and sewing; and not far from the glow of the burning logs the children learned their daily lessons and received their early religious training. Social activities were enjoyed about the hearth, especially during the long winter evenings; and when a member of the family was ill, the fireplace and its accessories were in constant use. The fireplace was the first place visited by the housewife in the early morning, and was usually the last place where she performed her household duties late at night.

A fine assortment of fireplace tools and accessories have been found at Jamestown, including iron tongs, shovels, andirons, parts of brass warming-pans, and a large fragment from a cast-iron fireback. One early 17th-century andiron recovered is attractively decorated with a cherub's head in relief.



A FEW FIREPLACE TOOLS UNEARTHED AT JAMESTOWN.



AN EARLY 17TH-CENTURY ANDIRON IN THE JAMESTOWN COLLECTION. NOTE THE CHERUB'S HEAD NEAR THE BASE.

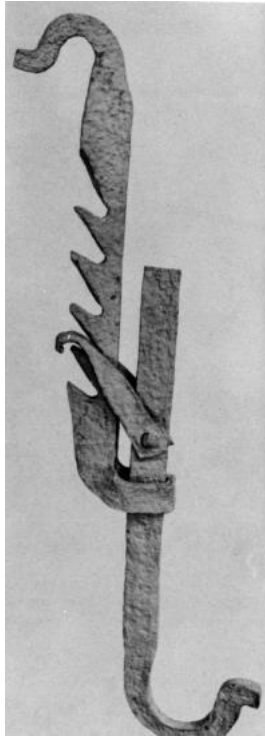
COOKING UTENSILS AND ACCESSORIES

A large and varied assortment of cooking utensils and kitchen accessories have been excavated, including kettles, pots, pans, skillets, frying pans, toasters, broilers, griddles, skimmers, skewers, spits, ladles, pothooks, trammels, cranes, trivets, cleavers, knives and forks, sieves, and colanders. While only a few are complete others are almost complete or at least easily recognizable.

During the early years of the colony, people in England who planned to emigrate to Jamestown were advised to bring the following "Household implements: One Iron Pot, One Kettle, One large frying-pan, One gridiron, Two skillets, One Spit, Platters, dishes, spoones of wood." With the exception of the wooden items, all of the utensils listed have been excavated.



AN IRON POT AND POT FRAGMENT UNEARTHED AT JAMESTOWN—TYPES USED DURING THE 17TH CENTURY.



A WROUGHT-IRON TRAMMEL USED FOR HANGING A POT FROM A FIREPLACE CRANE. THE ADJUSTABLE HOOK MADE IT POSSIBLE TO RAISE OR LOWER THE POT.



MANY EARTHENWARE VESSELS FOUND WERE USED FOR COOKING PURPOSES, INCLUDING BAKING DISHES, THREE-LEGGED POTS, AND COVERED POTS.



A FEW KITCHEN UTENSILS AND ACCESSORIES EXCAVATED AT JAMESTOWN: A LADLE, BRASS PAN, KNIFE BLADES, FORK, KETTLE FRAGMENTS, SPOUT, COLANDER FRAGMENTS, AND POT HOOKS.



A FAMILY ENJOYING A MEAL, ABOUT 1650. MANY OF THE EATING AND DRINKING VESSELS PORTRAYED, TOGETHER WITH MUCH OF THE TABLEWARE, ARE TYPES WHICH HAVE BEEN EXCAVATED. (Conjectural sketch by Sidney E. King.)

Table Accessories

In the small houses at Jamestown the kitchen also served as the dining room. During the early years, many settlers probably ate with wooden spoons out of wooden bowls and trenchers, and drank from mugs made of horn, wood, or leather. As the colony became well established, these crude utensils and vessels were used less frequently and were gradually replaced with ones made of pottery, metalware, and glassware. None of the perishable woodenware, horn, or leather items have been found at Jamestown, but a large assortment of more durable objects used at the table have been recovered. Space permits only brief descriptions of the more common types unearthed.

KNIVES, FORKS, AND SPOONS

The table knives found at Jamestown vary in length from $6\frac{3}{8}$ to $8\frac{1}{4}$ inches. Most of them have either bone or ivory handles, although 3 have embossed brass handles; and 1, found in a late 17th-century well, has an exquisite handle of banded agate.

The forks in the collection also have bone or ivory handles, the majority displaying 2 steel prongs, or tines. The number of prongs, however, is no positive identification of any particular period, as many English forks of the mid-17th century had 3 prongs, and a few had 4 prongs.

Types of spoons excavated include seal-heads, slipped ends, "puritans," and trifids. The majority were made of either pewter or latten metal (a brasslike alloy), although 3 in the collection were made of silver. The earliest spoons found have rounded bowls and 6-sided stems (handles), whereas those made after 1650 usually have oval bowls and flat, 4-sided handles. One of the silver spoons, with rounded bowl and slipped end, bears the initials of its owner, ^{WC}/_E, on the slipped end of the handle. This spoon appears to have been made between 1600 and 1625, and is still in excellent condition.

The most important spoon in the Jamestown collection, and one of the most significant objects excavated, is an incomplete pewter spoon—a variant of the trifid, or split-end, type common during the 1650-90 period. Impressed on the handle (in the trefoil finial of the stem) is the mark of the maker, giving his name, the Virginia town where he worked, and the year he started business. This is the sole surviving "touch" or mark of an American pewterer of the 17th century. The complete legend, encircling a heart, reads: "IOSEPH COPELAND/1675/CHUCKATUCK."

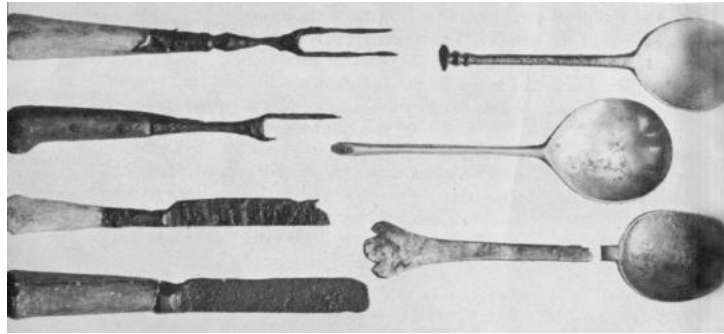
(Chuckatuck is a small Virginia village in Nansemond County, about 30 miles southeast of Jamestown.) Joseph Copeland later moved to Jamestown where he was caretaker of the statehouse from 1688-91. He may have made pewter in Virginia's first capital. His matchless spoon found in the old Jamestown soil is the oldest dated piece of American-made pewter in existence.

POTTERY AND PORCELAIN

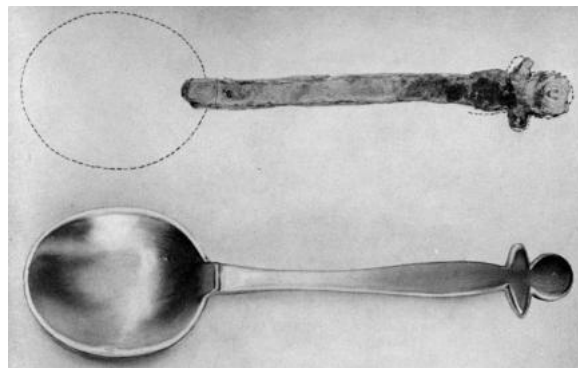
The largest and most representative collection of 17th-century European and early American pottery which has been excavated in America is on exhibition at Jamestown. Thousands of fragments of colorful types have been found, and by the exercise of extreme care and patience, museum technicians have pieced together many early specimens. These examples reveal the kinds of pottery used in the wilderness settlement over three centuries ago. Included in this ceramic collection are pitchers, bowls, jugs, cups, mugs, porringers, milk pans, jars, plates and dishes, pots, and platters. These were used at the table, as well as for the storage of foods, and for other purposes.

While some of the utilitarian earthenware was made at Jamestown, most of the pottery that has been found was imported from England. Many types also came from other European countries, including Germany, Holland, Italy, Spain, and Portugal. One kind of maiolica may have been made in Mexico, while the few fragments of porcelain recovered were made in China.

Because of the great variety and importance of the ceramic collection, a few of the more representative types will be described briefly.



A FEW KNIVES, FORKS, AND SPOONS UNEARTHED AT JAMESTOWN.



THE PEWTER SPOON HANDLE AT THE TOP, UNEARTHED AT JAMESTOWN, IS THE OLDEST DATED PIECE OF AMERICAN PEWTER IN EXISTENCE. IT WAS MADE BY JOSEPH COPELAND OF CHUCKATUCK, VA., IN 1675. THE SPOON ON THE BOTTOM IS A CONJECTURAL RESTORATION OF COPELAND'S SPECIMEN.



A FEW EXAMPLES OF LEAD-GLAZED EARTHENWARE MADE IN ENGLAND DURING THE 17TH CENTURY. ALL WERE UNEARTHED AT JAMESTOWN.



EXAMPLES OF LEAD-GLAZED EARTHENWARE MADE AT JAMESTOWN ABOUT 1640-50.



ENGLISH SGRAFFITO, OR SCRATCHED, WARE—ONE OF THE MOST COLORFUL TYPES OF POTTERY UNEARTHED AT JAMESTOWN.



ENGLISH SLIP-DECORATED WARE. ALTHOUGH MADE IN ENGLAND MAINLY FOR LOCAL CONSUMPTION, MANY ATTRACTIVE EXAMPLES WERE SHIPPED TO VIRGINIA DURING THE 17TH CENTURY.

Lead-glazed Earthenware.—Most of these vessels were made for utilitarian purposes, and were usually glazed only on the inside. While some were made at Jamestown, the majority were imported from England. One type, a grit-tempered earthenware, was manufactured in North Devonshire. Another kind, a hard-fired earthenware, was also made in England. At least two distinct types of local-made earthenware have been found, and, as many examples have well-proportioned shapes and attractive designs, it is evident that they were not fashioned by a young apprentice, but by a trained potter who took pride in shaping his wares.

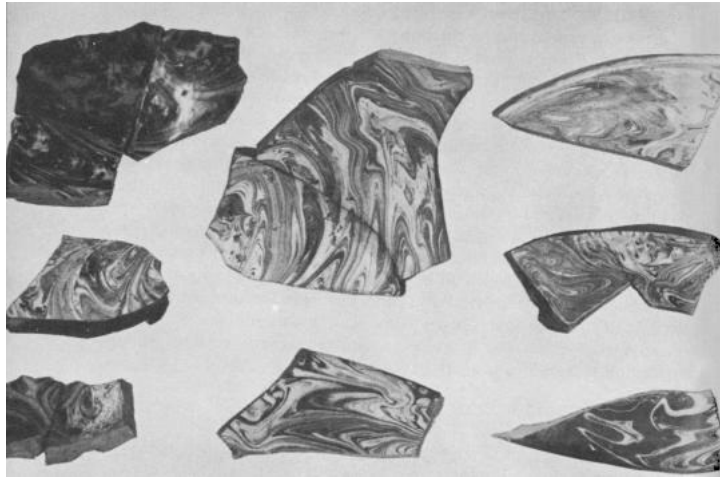
English Sgraffito-ware (a slipware).—This colorful pottery, beautifully decorated with incised designs, is an English earthenware of red or buff clay on which a slip was applied. Before firing, a decoration was scratched, stippled, or cut through the slip, exposing the darker color of the body. The entire piece then received a transparent lead glaze, either clear or covered with an oxide. The English sgraffito-ware found at Jamestown was made near Barnstaple, in North Devonshire, probably after 1640. The reddish-brown floral and geometric designs which decorate the vessels are unusually attractive against colorful yellow backgrounds. Sgraffito is an Italian word meaning scratched.

English Slip-decorated-ware.—This colorful English pottery, which was made for everyday use, is a lead-glazed earthenware decorated with a liquid clay or slip. The design was usually dropped or trailed upon the ware from the spout (or quill) of a slip cup, somewhat in the manner a baker decorates a cake with icing; or it may have been painted over a large area or placed on in molded pads. Although most of the slip-decorated-ware found at Jamestown was made in England, there is some evidence that a few vessels may have been manufactured in America during the late 17th century.

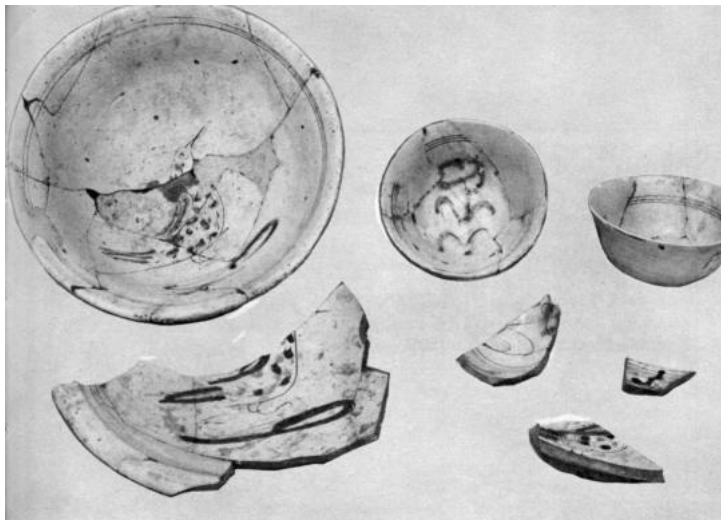
English Redware with Marbled Slip Decoration.—On this type English earthenware, which usually has a red body, the liquid slip was marbled or combed over the surface of the vessel with a toothed instrument of wire or leather to produce the effect of paper-marbling. Some in the Jamestown collection appear to have been made as early as 1625.

Italian Maiolica.—Maiolica is a word derived from a type of pottery made on the Spanish island of Mallorca. The 17th-

century Italian maiolica-ware found at Jamestown is a red-body earthenware with scratched or incised designs—a true sgraffito-ware. Somewhat similar in appearance to the English sgraffito-ware, the desired design was scratched through the cream-colored slip, revealing the reddish-brown body beneath. On many examples, colorful lines were hand painted over or near the incised designs, usually in reds, yellows, and greens, and were covered with a transparent lead glaze.



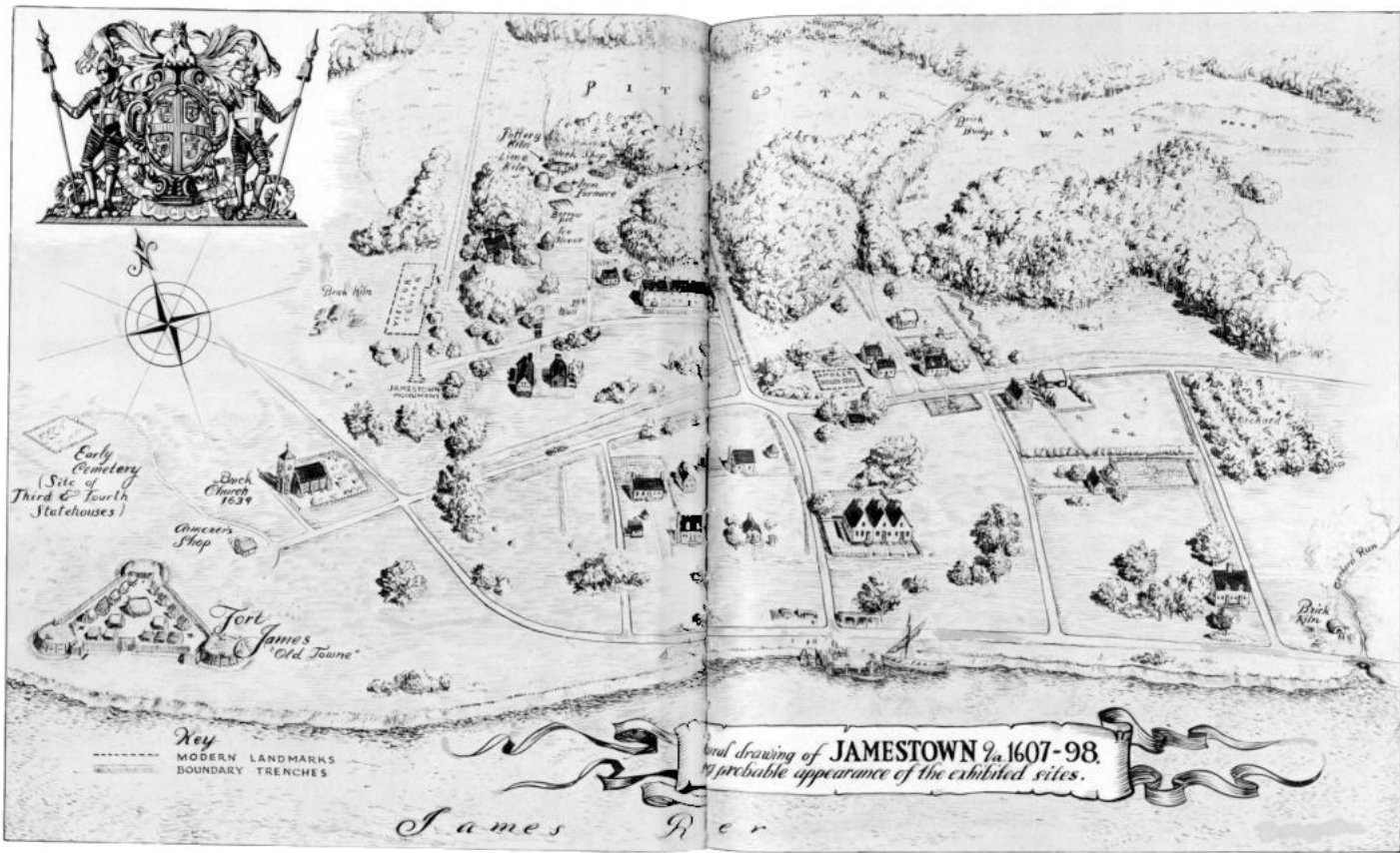
ENGLISH REDWARE WITH MARBLED SLIP DECORATION, 1625-50 PERIOD OR EARLIER, UNEARTHED AT JAMESTOWN.



LATE 17TH-CENTURY ITALIAN MAIOLICA BOWLS EXCAVATED AT JAMESTOWN.



A FEW EXAMPLES OF ENGLISH DELFTWARE IN THE JAMESTOWN COLLECTION.



Delftware.—This is a soft pottery covered with an opaque white tin glaze, and decorated with hand-painted designs, usually in blues and purples. A few specimens excavated are embellished with pleasing patterns in polychrome colors. Most of the delftware unearthed at Jamestown was made in England (Lambeth, Southwark, and Bristol), although a few examples were imported from Holland.

Spanish Maiolica.—This maiolica is a tin-glazed earthenware with a soft body usually buff in color and porous in texture. The colorful decorations were hand painted on the absorbent surface—usually in greens, blues, yellows, and reddish-browns, against a white background. Some small Spanish jugs in the collection bear very crude dark-red floral designs painted against a cream-colored background. A few examples of maiolica found at Jamestown are believed to have been made in Lisbon, and these usually have designs in blues and dark purples against a white background.

Salt-glazed Stoneware.—This common but attractive type of pottery found in many excavations at Jamestown includes mugs, jars, bottles, tankards, and jugs. It is a very hard ware which was fired at high temperatures and finished with a salt glaze, formed by throwing common salt into the furnace. The surface of the body has a pitted appearance resembling an orange peel, and is covered with a thin, glasslike coating. Most of the salt-glazed stoneware unearthed was made in Germany, although a small amount was manufactured in England.



COLORFUL SPANISH MAIOLICA FOUND WHICH APPEAR TO HAVE BEEN MADE BEFORE 1650.



A LARGE GERMAN STONEWARE JUG UNEARTHED AT JAMESTOWN. THE DATE "1661" APPEARS ABOVE THE MEDALLION.



A FEW EXAMPLES OF GERMAN SALT-GLAZED STONEWARE IN THE JAMESTOWN COLLECTION. ALL WERE MADE DURING THE 17TH CENTURY.



RECONSTRUCTED WINEGLASSES AND WINEGLASS FRAGMENTS IN THE JAMESTOWN COLLECTION.



NOTE THE MAKERS' MARKS OR SEALS ON THE WINEGLASS FRAGMENTS. ONLY A FEW ENGLISH WINEGLASSES BEARING 17TH-CENTURY MAKERS' SEALS HAVE BEEN FOUND IN AMERICA.

METALWARE EATING AND DRINKING VESSELS

While large numbers of eating and drinking vessels made of pottery have been excavated on Jamestown Island, only a few fragments of utensils made of silver, pewter, brass, and copper were found. Metalware vessels were relatively

scarce during the early years of the settlement, and their almost complete absence in the Jamestown collection may be attributed to the fact that not many of them were discarded, regardless of their worn condition. Only a few metal handles from mugs and cups, and a small number of pewter plate fragments, have been excavated.

Although no complete specimens of domestic silver and pewter eating and drinking vessels were found, 17th-century records and inventories indicate that many Jamestown families owned such wares (especially after 1630), including cups, beakers, dishes, salts, salvers, tankards, porringers, bowls, and plates.

It is of interest that 2 goldsmiths, 2 refiners, and a jeweler arrived at Jamestown in 1608 aboard the supply ship Phoenix. Although John Smith related that these artisans "never had occasion to exercise their craft," it is possible that they made a few metal objects (such as spoons) in the capital city.

GLASS DRINKING VESSELS

Glass was made at Jamestown in 1608-09, and again in 1621-24. It was, in all probability, the first commodity made by the English in a "factory" in the New World. Many glass fragments were found at the furnace site, but none was large enough to reveal what specific glass objects were made there. It appears that drinking glasses may have been among the items manufactured.

The majority of the glass drinking vessels unearthed at Jamestown were made in England, although a few were manufactured in Germany, Italy, and the Low Countries. In the collection are fragments from goblets, beakers, bowls, and wineglasses. Four of the English wineglass stems bear makers' seals, rare marks seldom found on English drinking vessels.

GLASS WINE AND GIN BOTTLES

These comprise a large and important part of the Jamestown collection. Literally thousands of glass fragments from these bottles have been unearthed, and by diligent and patient work a few complete wine and gin bottles have been pieced together.

The glass wine bottles were made in England. The oldest excavated, made between 1640 and 1660, have spherical bodies and tall necks. Those made between 1660 and 1680 have cup-shaped bodies with short necks. Of the period between 1680 and 1700 the neck is very short and the body is wide and squat. Insofar as is known, no glass wine bottles were used at Jamestown before 1640.



GLASS WINE BOTTLES UNEARTHED AT JAMESTOWN RANGING IN DATE FROM 1640 TO 1690. THOUSANDS OF FRAGMENTS OF THESE BOTTLES HAVE BEEN RECOVERED.



AN ASSORTMENT OF GLASS BOTTLE SEALS IN THE JAMESTOWN COLLECTION. SOME OF THE WEALTHY PLANTERS HAD THEIR INITIALS (OR OTHER ORNAMENTAL DEVICE) STAMPED ON THE SHOULDERS OF THE WINE BOTTLES WHICH THEY ORDERED FROM ENGLAND.



THIS DUTCH GIN BOTTLE EXCAVATED AT JAMESTOWN WAS IMPORTED FROM HOLLAND.

About 1650 the practice of affixing glass seals or buttons on the shoulders of English wine bottles was begun. The seal was inscribed with a name, or initials, or a date; sometimes a coat of arms or a crest, or other device or ornament. Many of these glass bottle seals have been found at Jamestown. As a rule, only the wealthy and influential planters had seals stamped on their wine bottles.

Gin bottles found at Jamestown are tall and square with thin glass sides. Imported from Holland, many were made as early as 1625. One gin bottle was miraculously unearthed intact, and not as much as a chip or crack was found on this 300-year-old fragile specimen.

FOOD STORAGE VESSELS AND FACILITIES

Many earthenware jars, pots, bowls, and jugs excavated at Jamestown were used for the storage of foods. Wooden and wicker containers were also used, although because of their perishable nature none was unearthed. Seventeenth-century inventories list many of these perishable storage items, including casks, barrels, hogsheads, tubs, bins, and baskets. Leather bottles are also mentioned in a few early records.



EARTHENWARE VESSELS USED FOR THE STORAGE OF FOODS. SOME WERE MADE AT JAMESTOWN, SOME WERE IMPORTED FROM ENGLAND.



"HARVESTING" ICE, ABOUT 1650. ARCHEOLOGICAL EXCAVATIONS REVEALED THAT ICEHOUSES WERE BUILT ON THE HISTORIC ISLAND OVER 300 YEARS AGO. (Painting by Sidney E. King.)

A brick-lined storage compartment was found in the cellar (below floor level) of one of the 17th-century buildings. It was used, undoubtedly, for the storage of such easily spoiled foods as milk, cheese, eggs, and cream. Wine, too, was probably kept in bottles in the cool compartment, as many broken bottles were found inside.

An extremely important discovery was a large, deep, ice-storage pit, believed to be the only 17th-century ice pit which has been excavated in Virginia. The conjectural painting on page 48 shows its probable appearance when in use about 1650. Ice-storage pits held dairy products, meats, and other spoilable foods as well as ice. Pond ice was usually cut and stored in the pit in late winter. Sometimes it lasted until late summer or early autumn.

Clothing and Footwear

The Jamestown settlers of the middle class were usually dressed in hard wearing, rough clothes made of homespun material, with a slightly better (and perhaps more colorful) costume for Sunday and holiday wear. In 1622 each Englishman who planned to emigrate to Jamestown was advised to supply himself with the following wearing apparel:

“One Monmouth cap [a flat, round cap].
Three falling bands [a neckband or collar of a shirt which turned down over the shoulders].
Three shirts.
One waste-coate.
One suite of Canvase [a suit made of coarse cloth, such as cotton, hemp, tow, or jute].
One suite of Frize [a woolen fabric with a nap].
One suite of Cloth.
Three paire of Irish stockings.
Foure paire of shooes.
One paire of garters.
One doozen of points [a point was a tie or string ending with an anklet and used to join parts of a costume as doublet and hose].”

The women wore plain frocks and petticoats, although a few of the wealthy ladies owned silk, satin, and velvet dresses. Bodices, as a rule, were long pointed, and skirts were full and long.

Perhaps the most unique items of wearing apparel recovered at Jamestown were several leather shoe soles and two almost-complete shoes, found in a dirtlined well in association with artifacts of the 1625-50 period.

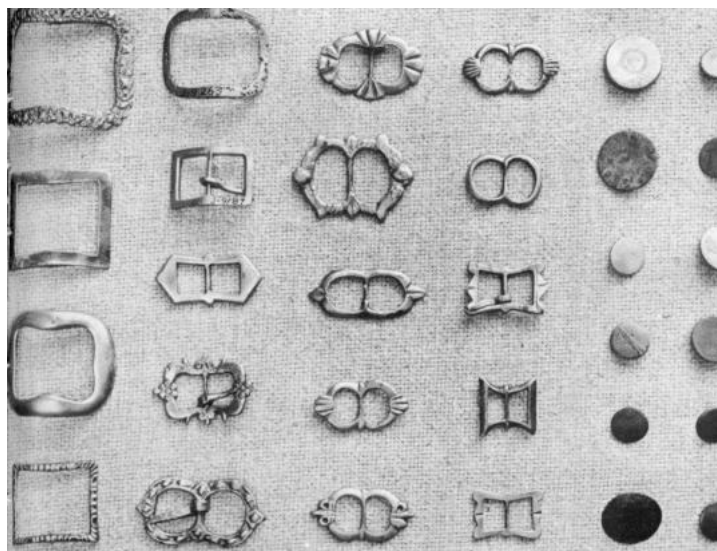


FOR EVERYDAY USE THE JAMESTOWN SETTLERS WORE HARDWEARING CLOTHES MADE OF HOMESPUN CLOTH. (Conjectural sketch by Sidney E. King.)

Other objects unearthed relating to wearing apparel and costume accessories, include an excellent assortment of buckles, buttons, and brass eyelets. Items in the collection which were used in the mending of clothes include needles, pins, and thimbles (both brass and silver).



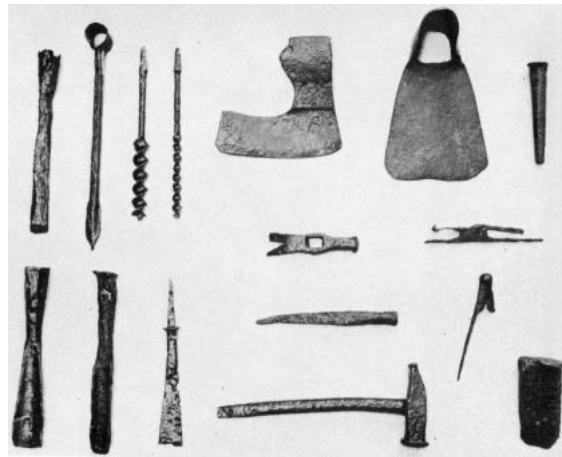
A LEATHER SHOE AND SEVERAL LEATHER SHOE SOLES WERE UNCOVERED IN AN EARLY 17TH-CENTURY WELL.



A FEW BUCKLES AND BUTTONS IN THE JAMESTOWN COLLECTION. MANY ARE OVER 300 YEARS OLD.



HOMESPUN CLOTHES WERE SELDOM DISCARDED. THE MANY PINS, NEEDLES, AND THIMBLES FOUND REVEAL THAT MENDING WAS A NEVER-ENDING CHORE FOR THE BUSY HOUSEWIFE.



AN ASSORTMENT OF CARPENTERS' TOOLS UNEARTHED AT JAMESTOWN. MOST OF THEM WERE USED OVER THREE CENTURIES AGO.



THE JAMESTOWN COOPER WAS A BUSY CRAFTSMAN. MANY BARRELS, HOGSHEADS, AND CASKS WERE NEEDED IN THE COLONY, AND LARGE QUANTITIES OF BARREL STAVES WERE MADE FOR SHIPPING TO ENGLAND. (Painting by Sidney E. King.)

Artisans and Craftsmen

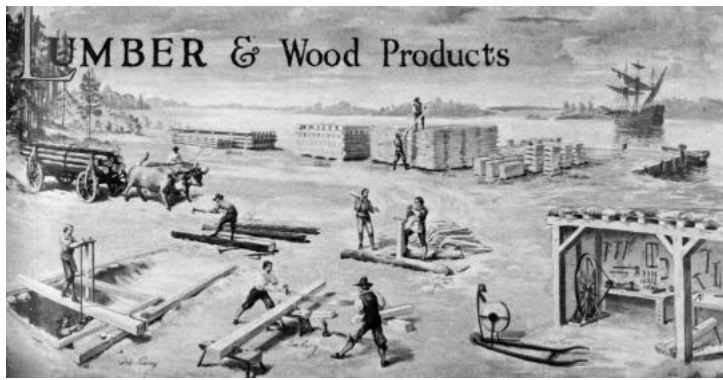
Numerous objects recovered at Jamestown are extremely important as they reveal the kinds of craftsmen and artisans who worked in Virginia's first capital, the nature of their tools and equipment, and examples of their handiwork.

THE CARPENTER

Scores of tools used by the men who helped build the Jamestown houses have been unearthed, including chisels, augers, gouges, hammers, reamers, saw fragments, bits, axes and hatchets, plane blades, gimlets, files, calipers, compasses, scribes, nail pulls, and a saw wrest. A grindstone was found in a refuse pit not far from the historic church tower.

THE COOPER

Some tools used by the cooper, including draw shaves, adzes, plane irons, and race knives, have been excavated. Several barrel staves—probably made at Jamestown—were found in a few wells. Because of the great demand for barrels, casks, and hogsheads (both in Virginia and England) the Jamestown cooper was a busy artisan. His products were needed at all times, especially after 1620 when the Virginia settlers began shipping large quantities of tobacco to England in wooden hogsheads.



TIMBERING—ONE OF THE FIRST ENGLISH INDUSTRIES IN THE NEW WORLD. (Painting by Sidney E. King.)



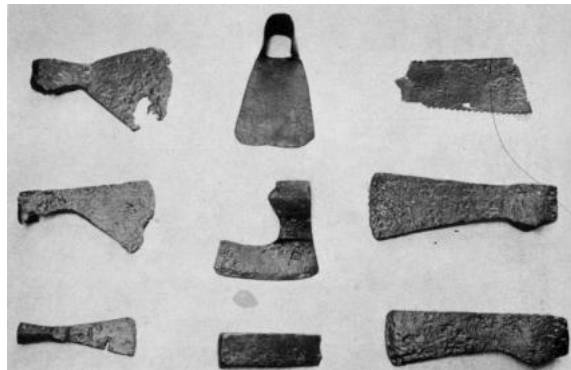
AN EARLY 17TH-CENTURY, TWO-MAN, CROSSCUT SAW.

THE WOODCUTTER AND SAWYER

Numerous tools found on Jamestown Island relate to timbering, including felling axes, hewing axes, hatchets, saws, and wedges. An early 17th-century two-man crosscut saw has been recovered almost intact. Records indicate that pit saws were used, although none has been excavated.

THE IRONWORKER

A small, primitive hearth or furnace, where small amounts of iron may have been smelted during the early part of the 17th century, was uncovered during archeological explorations in 1955. A few miles upriver from Jamestown, at Falling Creek, the English built their first iron furnace in America in 1620-21. Iron was smelted in the furnace, and a few tools were forged—the first iron objects made in the New World by the English. In 1622 the Indians massacred the ironworkers and their families, and destroyed the furnace. Although it was never rebuilt, its importance cannot be overstressed, for the Falling Creek site can rightfully claim the honor of being the birthplace of the American iron industry.



A FEW OF MANY TOOLS UNEARTHED AT JAMESTOWN WHICH WERE USED FOR TIMBERING: FELLING AXES, A HEWING AXE, ADZE, HATCHET, WEDGE, AND SAW FRAGMENT.



MAKING "TRIALS" OF IRON. EVIDENCES OF AN EARTH OVEN OR SMALL FURNACE WERE DISCOVERED AT JAMESTOWN DURING ARCHEOLOGICAL EXPLORATIONS. SMALL AMOUNTS OF IRON MAY HAVE BEEN SMELTED IN THE FURNACE DURING THE EARLY YEARS OF THE SETTLEMENT. (Conjectural sketch by Sidney E. King.)

THE BLACKSMITH

In 1955, archeologists discovered the remnants of an early 17th-century forge. At the site, blacksmith's tools, bar iron, sword guards, unfinished iron objects, and slag were found. This gave evidence that a blacksmith once plied his trade only a few yards west of the ancient brick church. Many blacksmiths worked at Jamestown (there was one among the first group of settlers). In the Jamestown collection are many tools which they left behind, including pliers, pincers,

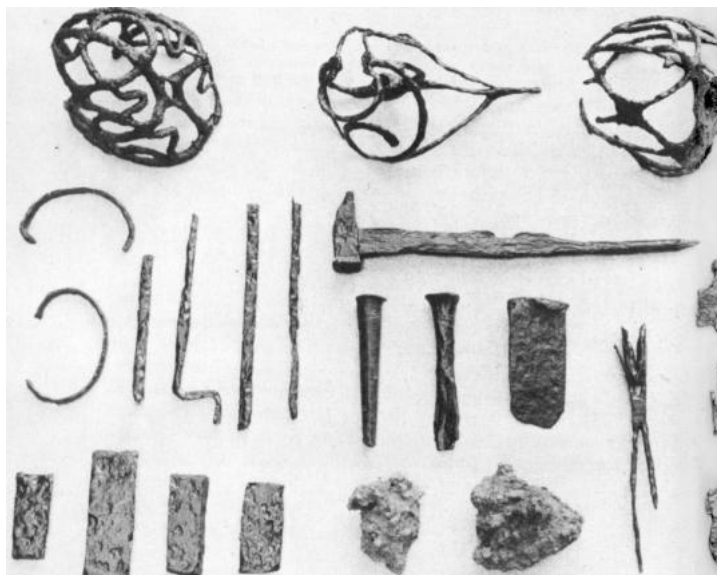
chisels, punches, hammers, and a small anvil.

THE BOATBUILDER

Many small boats were built at Jamestown. They were built by English shipwrights and carpenters, who came from a long line of efficient craftsmen. These small vessels afforded the principal means of transportation through the uncharted wilderness tidewaters of Virginia. They were used for fishing, trade, and discovery. A few small handwrought iron tools used by Jamestown boatbuilders have been excavated on the historic island.

THE POTTER

In 1955 a pottery kiln site was discovered at Jamestown. Nearby were found many utilitarian earthenware vessels of the 1625-40 period—definite evidence that pottery was made in Virginia over 300 years ago. Although made for everyday use, many of the pieces unearthed are symmetrical and not entirely lacking in beauty. The unknown Jamestown potters were artisans, trained in the mysteries of an ancient craft, who first transplanted their skills to the Virginia wilderness.



OBJECTS FOUND AT A 17TH-CENTURY FORGE SITE AT JAMESTOWN: BLACKSMITH'S TOOLS, BAR IRON, A FEW INCOMPLETE ITEMS, SWORD GUARDS, AND SLAG. IT APPEARS THAT THE FORGE WAS IN OPERATION AS EARLY AS 1625.



BUILDING A SMALL BOAT AT JAMESTOWN ABOUT 1650. (Painting by Sidney E. King.)



BOAT-BUILDING TOOLS FOUND, ALL MADE BEFORE 1700.



EARTHENWARE VESSELS MADE AT JAMESTOWN BETWEEN 1625 AND 1640. THE SITE OF AN EARLY 17TH-CENTURY POTTERY KILN WAS DISCOVERED ON THE ISLAND IN 1955.



MAKING POTTERY AT JAMESTOWN, ABOUT 1625-40. (Painting by Sidney E. King.)



ARTIFACTS FOUND NEAR THE SITE OF THE JAMESTOWN GLASSHOUSE WHICH WAS IN OPERATION AS EARLY AS 1608: A SMALL MELTING POT, PART OF A WORKING HOLE, FRAGMENT FROM LARGE MELTING POT, CULLET (BROKEN OR REFUSE GLASS SHOWN IN LOWER LEFT CORNER), AND GREEN GLASS FRAGMENTS (LOWER CENTER AND LOWER RIGHT).



BLOWING GLASS AT JAMESTOWN IN 1608. (Conjectural sketch by Sidney E. King.)

THE GLASSBLOWER

Glassblowers were working at Jamestown in 1608-09, and again in 1621-24. The trial glass they made in 1608 was

sent to England—the first glass manufactured by Englishmen in the New World. The small glass fragments excavated at the furnace sites do not reveal what was produced, but probably nothing more complicated than window glass, bottles and vials, and plain drinking glasses. It is believed that the small glass factory at Jamestown was the first English “factory” in America.

THE BRICKMAKER AND TILEMAKER

Four brick kilns have been excavated. In two of them roofing tile and bricks were found. An iron spade, probably used in preparing the clay for brickmaking, was found in one of the kilns. The oldest kiln unearthed is believed to have been in use as early as 1625. Many brickmakers emigrated to Jamestown during the 1600’s.

THE LIMEBURNER

Four lime kilns were unearthed on the historic island, where oyster shells from the James River were burned and converted into lime by the limeburner. As early as 1610 “lymeburners” emigrated to Virginia, and thereafter many such workers came to the colony from England.



FOUR BRICK KILNS HAVE BEEN EXCAVATED. THE ONE SHOWN HAD FIVE FIRING CHAMBERS. ROOFING TILES WERE ALSO MADE IN THE JAMESTOWN BRICK KILNS.



A 17TH-CENTURY LIME KILN EXCAVATED AT JAMESTOWN. IN IT OYSTER SHELLS FROM THE JAMES RIVER WERE BURNED FOR MAKING LIME. THE IRON HOOPS WHICH SUPPORTED THE ARCHED TOP OF THE KILN BUCKLED FROM THE INTENSE HEAT.



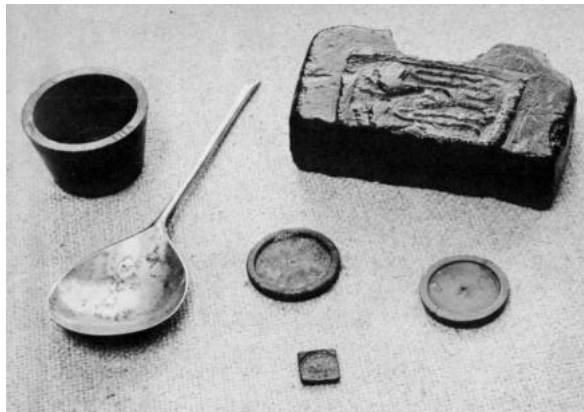
MAKING LIME FROM OYSTER SHELLS IN A KILN, ABOUT 1625. (Conjectural sketch by Sidney E. King.)

OTHER CRAFTSMEN

Contemporary records, confirmed by certain objects found at Jamestown (especially small tools), reveal that pewterers, silversmiths, colliers, wheelwrights, calkers, bricklayers, millwrights, shoemakers, masons, cordage makers, tanners, tobacco pipemakers, armorers, gunmakers, braziers, and others worked in the capital city at various periods between 1607 and 1699.



A SILVERSMITH WEIGHING CLIPPED COINS. (Conjectural sketch by Sidney E. King.)



BRASS WEIGHTS AND A PIECE OF SCRAP BRASS UNEARTHED AT JAMESTOWN. RECORDS INDICATE THAT MANY METALWORKERS EMIGRATED TO VIRGINIA DURING THE 17TH CENTURY.

Home Industries

During archeological explorations many artifacts relating to household and town industries were recovered. It is believed that many of these small industries were home activities carried on in the houses at Jamestown. A few of these activities, and the products of them are mentioned briefly.

SPINNING AND WEAVING

A few metal parts from spinning wheels and looms have been excavated—reminders that the pioneer housewife who spun the thread and yarn, and wove the cloth for her large family, was seldom idle.

MALTING AND BREWING

One Jamestown building or house (whose brick foundations were discovered in 1955) appears to have been used for malting and brewing beer and ale, or carrying out some activity requiring distillation. A few pieces of lead were found which may have been part of a lead cistern for holding barley. The three brick ovens that were uncovered may have been used as drying kilns. A handle from a copper kettle was found near one of the ovens, and pieces of copper and lead pipes were unearthed not far from the building. The structure itself appears to have been used between 1625 and 1660.





BREWING BEER AT JAMESTOWN. (Conjectural sketch by Sidney E. King.)

DAIRYING AND CHEESEMAKING

Earthenware milk pans, bowls and pots, iron hoops (from wooden vessels), an earthenware funnel, and parts of skimmers, sieves, and ladles have been excavated. All these are evidence that dairying was an important household industry. This activity was usually carried on in a brick-paved room (with slatted windows) located on the northwest side of the house. Cheese, as well as butter, was probably made in the same room.



LEAD AND COPPER PIPES, KETTLE FRAGMENTS, A BRASS SPIGOT, AND OTHER ITEMS FOUND WHICH MAY HAVE BEEN USED FOR BREWING OR DISTILLING PURPOSES.

BAKING

One of the largest objects that has been found is an earthenware baking oven, which was unearthed in an old ditch near the site of the May-Hartwell House. Restored from over 200 fragments, the oven was probably used between 1650 and 1690. It may have been made at Jamestown, molded of native clay and fired in a pottery kiln. In use, heated stones were placed inside the oven and left until the walls were hot enough for baking. Sometimes, however, the oven may have been placed directly on the embers of the fire. It undoubtedly was used out of doors, near a small house.

ASSOCIATED INDUSTRIES

A few artifacts that have been recovered are associated with millers, drapers, basketmakers, cutlers, tailors, barbers, netmakers, and glovers. These tradesmen usually worked in or near their homes.



EARTHENWARE MILK PAN, BRASS LADLE, FUNNEL FRAGMENT, AND OTHER ITEMS FOUND WHICH RELATE TO DAIRYING AND CHEESEMAKING.



BAKING BREAD IN AN OUTDOOR BAKING OVEN ABOUT 1650. (*Conjectural sketch by Sidney E. King.*)



IN THIS OVEN A JAMESTOWN WOMAN BAKED BREAD OVER 300 YEARS AGO. IT APPEARS TO HAVE BEEN IN USE BETWEEN 1650 AND 1690.



JAMESTOWN SOLDIERS CARRYING POLEARMS (A HALBERD AND A BILL). (CONJECTURAL SKETCH BY SIDNEY E. KING.)

Military Equipment

The vast assemblage of military equipment that has been unearthed (probably the largest collection of late 16th- and 17th-century English weapons used in America) emphasizes the important part which firearms and other weapons played during the early years of the settlement. They helped the colonists to protect themselves from the ever-menacing Indian and from the Spaniards who might at anytime have sailed up the James River to attack the small colony. They were also the means of providing the settlers with much of their food.

During the early years of the colony each Englishman who planned to emigrate to Virginia was advised to supply himself with the following "Armes":

"One Armour compleat, light.

One long Peece, five foot or five and a halfe, neere Musket bore.

One sword.

One bandaleere [a bandoleer was a belt worn to carry the cases which held the powder charges].

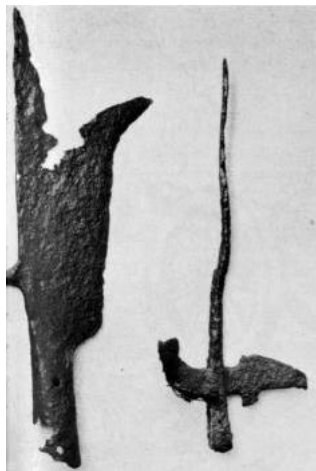
Twenty pound of powder.

Sixty pound of shot or lead, Pistoll and Goose shot."

Most of the kinds of arms listed have been found at Jamestown and will be described briefly along with other types of weapons which were unearthed.

POLEARMS

Parts from several polearms, including bills, pikes, and a halberd, have been excavated. The recovered halberd (a polearm with sharp cutting edges and a spearlike point) is typical of the late 16th century, and may have been made as early as 1575. A few bills were unearthed, all dating around 1600. (A bill is a polearm, having a long staff terminating in a hook-shaped blade, usually with spikes at the back and top.) Two pike butts were also unearthed.



TWO EARLY 17TH-CENTURY POLEARMS—A BILL AND HALBERD—UNEARTHED AT JAMESTOWN. BOTH WEAPONS HAD LONG WOODEN HANDLES.



THE CALTROP UNEARTHED AT JAMESTOWN. THIS SHARP-POINTED INSTRUMENT WAS THROWN ON THE GROUND TO IMPEDE AN ENEMY'S INFANTRY AND CAVALRY.

CALTROP

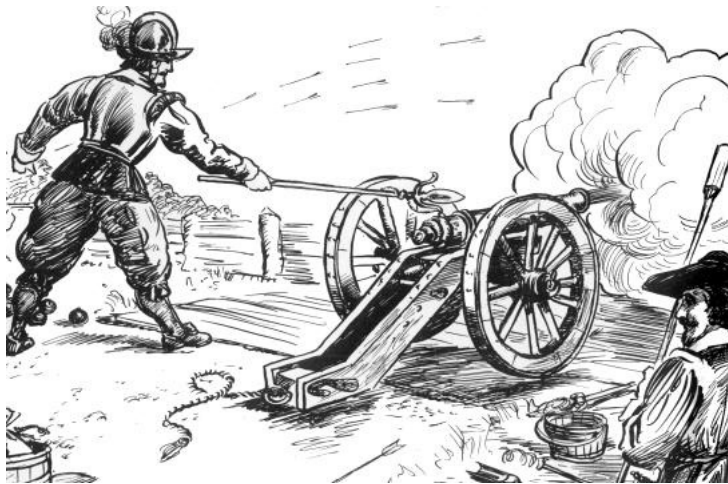
This small item unearthed at Jamestown is an instrument with 4 iron points, so arranged that no matter how it lands, 1 point always projects upward, to impede the progress of an enemy's cavalry and to prevent surprise attacks.

SWORDS, RAPIERS, AND CUTLASSES

Types of swords that have been found include broadswords, cutlasses or back swords, and rapiers. Three examples are complete, or nearly so—a cutlass, a broadsword, and a swept-hilt rapier. Many basket hilts were unearthed together with guards from other type swords, pommels, and blade fragments. A number of these edged weapons were made between 1600 and 1625. Several basket-hilted guards and blade fragments were found at the site of an early 17th-century forge, which may have been an armorer's workshop.

CANNON

One small cannon barrel fragment, possibly from a light cannon known as a robinet, has been unearthed (the bore at the end of the barrel is only 1¼ inches across). A varied assortment of 17th-century cannon balls have also been found, appropriate sizes for such ordnance as demiculverines, sakers, minions, and falcons.



FIRING A DEMICULVERINE FROM A BASTION AT "JAMES FORT." (Conjectural sketch by Sidney E. King.)



HILT AND PORTION OF BLADE OF A SWEEP-HILT RAPIER EXCAVATED AT JAMESTOWN OF THE 1600-1610 PERIOD.

MUSKETS

An excellent assemblage of 17th-century musket barrels and gun parts have been recovered from the Jamestown soil, reminiscent of times when Indians attempted to wipe out the small settlement.

Among the gunlocks found are matchlocks, wheel-locks, snaphaunces, "doglocks," and flintlocks. The first settlers were equipped with both wheel-lock and matchlock muskets. Some of the muskets were so heavy, they required a forked ground-rest to shoot (parts of two forked ground-rests have been excavated). Other muskets, like the caliver, were light, and could be fired without the use of a support.

The standard musket during the early years of the settlement was the matchlock. By 1625, however, the picture had changed, for the wheel-lock, snaphaunce, and "doglock," were being used in large numbers, and the matchlock had become obsolete.

PISTOLS

Only a few pistol barrels and parts have been unearthed. One pistol barrel is attractively ornamented with silver

bands.

LIGHT ARMOR AND SIEGE HELMET

A breastplate and backpiece from a light suit of armor (probably a pikeman's suit) were found in a refuse pit. These interesting specimens were probably made in England during the 1600-20 period.

In 1953, Sgt. Floyd E. Painter found an English siege helmet (1600-40 period) 4 miles down the river from Jamestown Island.



A JAMESTOWN SENTRY ON DUTY SHOULDERING HIS HEAVY MATCHLOCK MUSKET. (*Conjectural sketch by Sidney E. King.*)



EARLY MUSKET BARREL AND GUN PARTS EXCAVATED AT JAMESTOWN.



BREASTPLATE FROM A LIGHT SUIT OF ARMOR FOUND IN A REFUSE PIT. THIS WAS ONE TYPE USED BETWEEN 1600 AND 1640.



A HEAVY SIEGE HELMET FOUND 4 MILES DOWNRIVER FROM JAMESTOWN. WEIGHING OVER 8 POUNDS, IT WAS ONE TYPE USED IN EUROPE DURING THE EARLY YEARS OF THE 17TH CENTURY.



THE EARLY JAMESTOWN SETTLERS WERE ADVISED TO EQUIP THEMSELVES WITH "ONE ARMOUR COMPLEAT, LIGHT." (*Conjectural sketch by Sidney E. King.*)

Farming

The first settlers brought seeds from England, and planted wheat 2 weeks after landing at Jamestown.

The early Virginians successfully grew many kinds of crops: grains (wheat, Indian corn, barley, oats, and rye), vegetables (peas, beans, turnips, parsley, onions, potatoes, cabbage, cauliflower, carrots, parsnips, lettuce, and others), and fruits (apples, peaches, apricots, quince, figs, grapes, and melons).

The colonists planted Indian corn as early as 1609, and cultivated many other Indian foods, including pumpkins, beans, and squash. They cultivated tobacco (an Indian plant) as early as 1612, and during the remainder of the century it was the most profitable crop grown. For many years it was the economic salvation of the struggling colony.

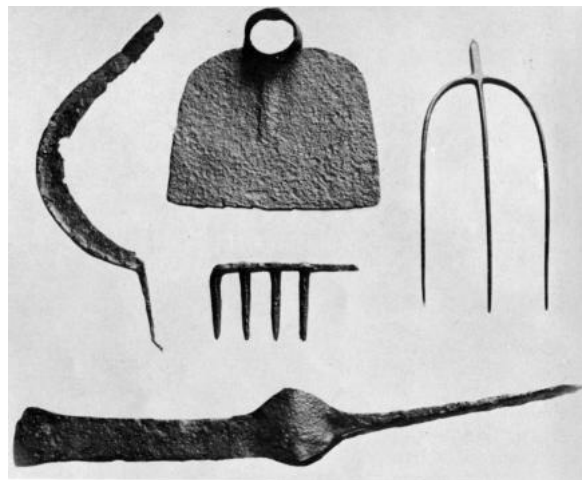
Attempts were made by the early colonists to grow other crops which, for various reasons, did not thrive at Jamestown. Some plants, like bananas, pineapple, citrus fruits, and pomegranates, could not withstand the cold Virginia winters. Other plants, including rice, cotton, indigo, sugarcane, flax, hemp, and olives, did not grow vigorously for one reason or another, and repeated efforts to cultivate them usually resulted in failure. Mulberry trees grew well at Jamestown (the leaves were used to feed silk worms), but attempts to make silk were not successful commercially.



TOOLS USED IN THE CULTIVATION OF TOBACCO OVER 300 YEARS AGO. THESE TOOLS—HOE, BILLHOOK, AND CUTTING KNIVES—WERE EXCAVATED AT JAMESTOWN.



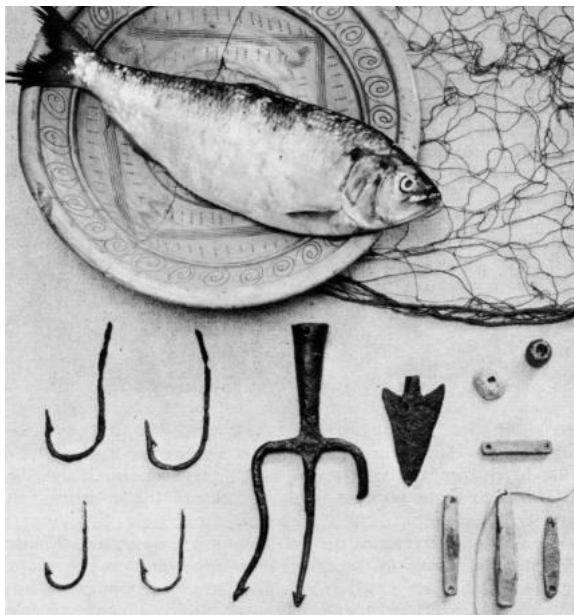
CULTIVATING A SMALL GARDEN IN VIRGINIA. (Conjectural sketch by Sidney E. King.)



A FEW FARM TOOLS USED BY AN EARLY SETTLER FOR CULTIVATING HIS NEWLY CLEARED LAND.



FISHING PROVIDED FOOD AS WELL AS RECREATION FOR THE COLONISTS. (Conjectural sketch by Sidney E. King.)



A FEW OF THE MANY ARTIFACTS RELATING TO FISHING UNEARTHED AT JAMESTOWN: FISHHOOKS, FISH-GIGS, AND LEAD NET WEIGHTS.

Handtools used by the Jamestown farmers during the 17th-century have been found in abundance. These include axes, picks, billhooks, pitchforks, spades, rakes, mattocks, sickles, scythes, broad hoes, narrow hoes, and shovels.

Only a few parts belonging to heavy farming implements have been unearthed, including a few ploughshares and small metal fragments from wagons, carts, and harrows.

Fishing

When the first settlers planted their small colony at Jamestown, the tidewater rivers and bays and the Atlantic Ocean bordering the Virginia coast teemed with many kinds of fish and shellfish which were both edible and palatable. Varieties which the colonists soon learned to eat included sheepshead, shad, sturgeon, herring, sole, white salmon, bass, flounder, pike, bream, perch, rock, and drum, as well as oysters, crabs, and mussels. Seafood was an important source of food for the colonists, and at times, especially during the early years of the settlement, it was the main source.

Those in England who planned to go to Virginia were always advised to provide themselves (among other items) with nets, fishhooks, and lines.

During archeological explorations, fishhooks, lead net weights, fish-gigs, and small anchors were uncovered. These are reminders of a day when fish and shellfish were abundant in every tidewater Virginia creek, river, and bay.

Health

Keeping well and healthy, even managing to stay alive in the unfamiliar Virginia wilderness during the first two decades of the Jamestown settlement, was no easy matter. In the group of 105 original settlers, 67 died during the first 8 months. During the hard winter of 1609-10 (known as the "starving time"), the population dwindled from 500 to about 60 as a result of sickness, Indian attacks, and famine.

One of the members of the first colony was a surgeon, William Wilkinson by name. As the colony grew, other surgeons, physicians, and apothecaries, emigrated to Virginia. Their lot was not easy, for it appears that they were seldom idle in an island community having more than its share of "cruell diseases, Swellings, Flixes, Burning Fevers, warres and meere famine."

During archeological explorations, drug jars, ointment pots, bleeding bowls, mortars and pestles, small bottles and vials, and parts of surgical instruments were recovered. These, undoubtedly, were used countless times at Jamestown by unknown "chirurgions," doctors of "physickes," and apothecaries—men who tried to keep the colonists well with their limited medical equipment and scant supply of drugs.

Amusements and Pastimes

The difficult and time-consuming job of conquering the Virginia wilderness (clearing the land, building homes, planting and harvesting crops, and warding off Indian attacks) left few hours for leisure and amusements. There were times, however (especially after the first few hard years had passed), when a colonist could enjoy himself by smoking his pipe, playing a game, practicing archery, bowling, playing a musical instrument, singing a ballad, or taking part in a lively dance. Excavated artifacts reveal that the settlers enjoyed at least these few amusements and pastimes.



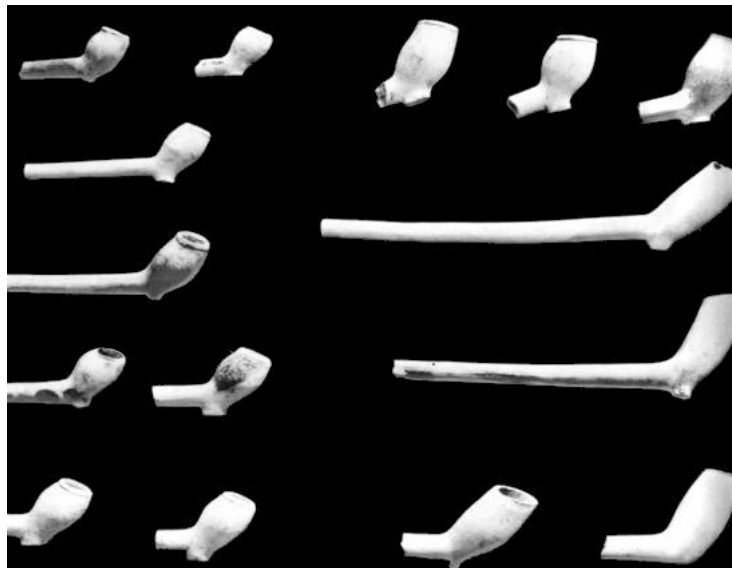
A PHYSICIAN BLEEDING A PATIENT. (Conjectural sketch by Sidney E. King.)



A FEW ITEMS UNEARTHED AT JAMESTOWN WHICH WERE USED BY DOCTORS AND APOTHECARIES. INCLUDED ARE DRUG JARS, OINTMENT POT, BLEEDING BOWL, MORTAR AND PESTLE FRAGMENTS, GLASS VIALS, AND PORTIONS OF SURGICAL INSTRUMENTS.



ENJOYING A SMOKE IN A TAVERN, ABOUT 1625. (Conjectural sketch by Sidney E. King.)



A FEW OF THOUSANDS OF CLAY PIPE FRAGMENTS UNEARTHED AT JAMESTOWN. THE ONES SHOWN RANGE IN DATE FROM 1600 TO 1700. DURING THIS 100-YEAR PERIOD, PIPES DEVELOPED FROM SMALL BOWLS TO FAIRLY LARGE ONES.

SMOKING

The first colonists were quite familiar with the use of tobacco, and it is believed that many of them smoked clay pipes. Evidently there was some demand for tobacco pipes by the early planters as one of the men, Robert Cotten, who reached Jamestown in January 1608, was a tobacco pipemaker.

In 1611-12 John Rolfe had experimented with tobacco plants in Virginia (he used Virginia plants as well as varieties from the West Indies and South America), and was successful in developing a sweet-scented leaf. It became popular overnight, and for many years was the staple crop of the infant colony. There was a prompt demand for the new leaf in England, and its introduction there was an important factor in popularizing the use of clay pipes. After 1620 the manufacture of white clay pipes in England increased by leaps and bounds.

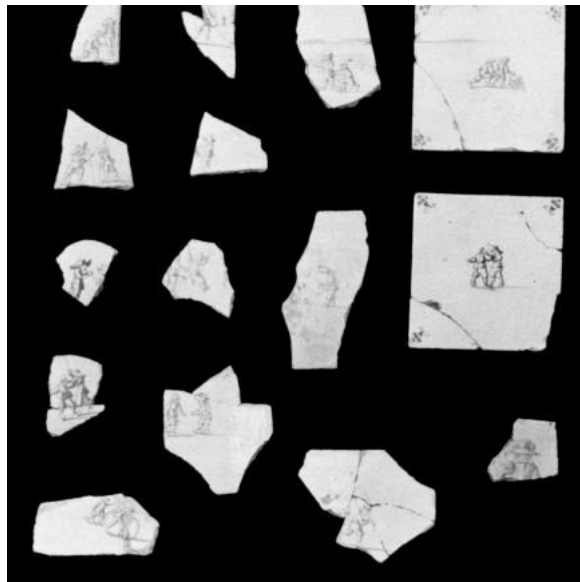
It is estimated that there are over 50,000 clay pipe bowls and stem fragments in the Jamestown collection—perhaps the largest assemblage of its kind extant. Pipe bowls and stem fragments were found wherever excavations were made, indicating that the smoking of clay pipes was an extremely popular custom at Jamestown.

During the 1607-1700 period, pipe-bowls developed in size from small to fairly large. In most examples that have been found, the early pipes have larger stem-holes than pipes made during the latter years of the century.

Although the majority of pipes found at Jamestown were imported from England, some were made in Holland. Some of the colonists made their pipes in Virginia from local clay, either by pipemaking machines or by handmolding. The English and Dutch pipes were white in color, whereas the local product was brown. As they were fragile, not a single complete pipe has been unearthed at Jamestown.



HARVESTING TOBACCO AT JAMESTOWN, ABOUT 1650. (Painting by Sidney E. King.)



CHILDRENS' GAMES DEPICTED ON DUTCH DELFTWARE FIREPLACE TILES ARE VERY SIMILAR TO THE GAMES CHILDREN PLAY TODAY. THE TILES WERE MADE IN HOLLAND ALMOST 300 YEARS AGO.

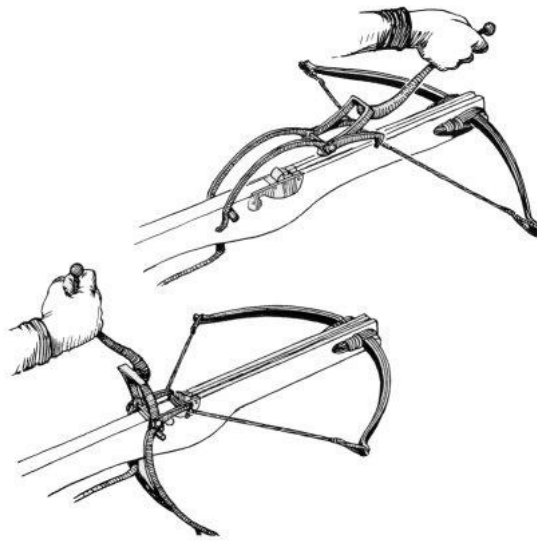
GAMES

A few ivory fragments that have been excavated appear to be parts of dice and chessmen. Chess was popular during the 17th century, and many dice games, including even and odd, hazard, passage, mumchance, and novem were played.

Other games which undoubtedly were played in many Jamestown homes were tick-tack, backgammon, Irish, and cards. Card games were popular, especially primero, trump, piquet, saint, and decoy.

Many 17th-century fireplace tiles in the Jamestown collection are decorated with charming little pictures depicting children's games. Activities portrayed include skating, bowling, spinning tops, fishing, rolling hoops, using a yo-yo, swinging, wrestling, skipping rope, shooting, playing skittles, riding a hobby horse, sledding, boxing, and playing musical instruments. These pictures remind us that games played by boys and girls today are very similar to those enjoyed by children three centuries ago.





ARCHEOLOGICAL EXPLORATIONS REVEALED THAT THE COLONISTS ENJOYED ARCHERY. THE IRON LEVER SHOWN, KNOWN AS A "GOAT'S FOOT," WAS USED FOR SETTING THE STRING OF A LIGHT HUNTING CROSSBOW. IT WAS FOUND 4 MILES FROM JAMESTOWN. ILLUSTRATION SHOWING THE USE OF A "GOAT'S FOOT" FROM *Weapons, A Pictorial History* BY EDWIN TUNIS.

ARCHERY AND HUNTING

One interesting item relating to archery has been found 4 miles from Jamestown. Known as a "goat's foot," it is an iron lever which was used for pulling back and setting the string of a light hunting crossbow.

Contemporary records indicate that hunting game birds and animals was a popular New World diversion. Such sport served a twofold purpose, as it offered recreation to the settler and helped provide food for his table. Parts of early fowling pieces and numerous lead birdshot (called goose or swan shot during the early years of the 17th century) have been recovered.

MUSIC AND DANCING

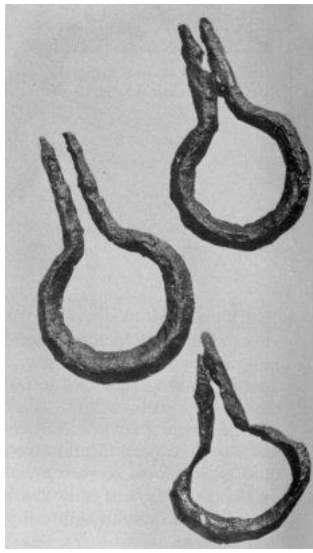
A large assortment of iron and brass Jew's harps (also known as Jew's trumps) have been found. This small instrument is lyre-shaped, and when placed between the teeth gives tones from a bent metal tongue when struck by the finger. Modulation of tone is produced by changing the size and shape of the mouth cavity.

As there is no record of spinets, or virginals, having been used at Jamestown, we have no way of knowing whether such wire-stringed, keyboard instruments were used in the homes of the more prosperous planters, together with other musical instruments of the period.

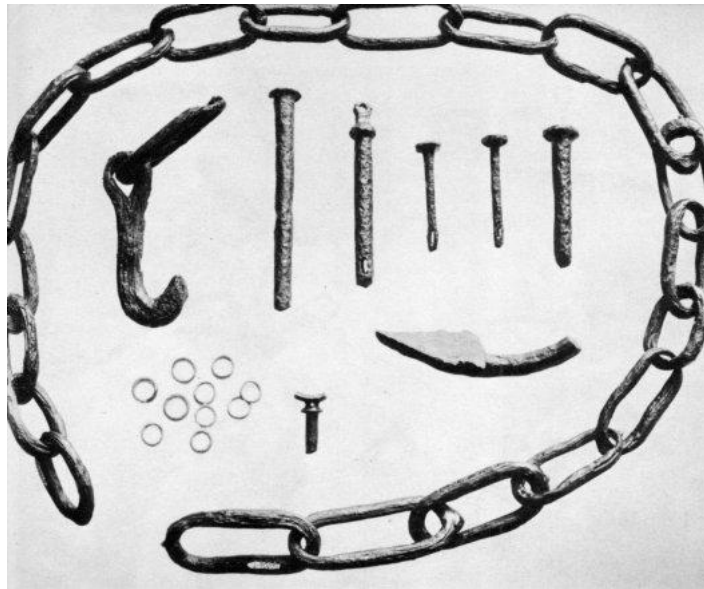
It is quite certain, however, that the Jamestown settlers knew the songs and ballads which were sung in Great Britain in those days. They were also familiar with English, Irish, Welsh, and Scotch dances. A few contemporary accounts reveal that the Virginia colonists enjoyed merry tunes and ditties, as well as lively dances. Although living in a wilderness, there were times when they could enjoy a few leisure-hour activities and amusements, including singing and dancing.



PLAYING A JEW'S HARP—ENJOYING A LITTLE MUSIC IN THE VIRGINIA WILDERNESS. (Conjectural sketch by Sidney E. King.)



AN ASSORTMENT OF JEW'S HARPS UNEARTHED AT JAMESTOWN.



A FEW OBJECTS RECOVERED AT JAMESTOWN WHICH WERE ONCE USED ON 17TH-CENTURY BOATS—REMINERS OF A DAY WHEN TRAVEL IN VIRGINIA WAS LARGELY BY WATER.

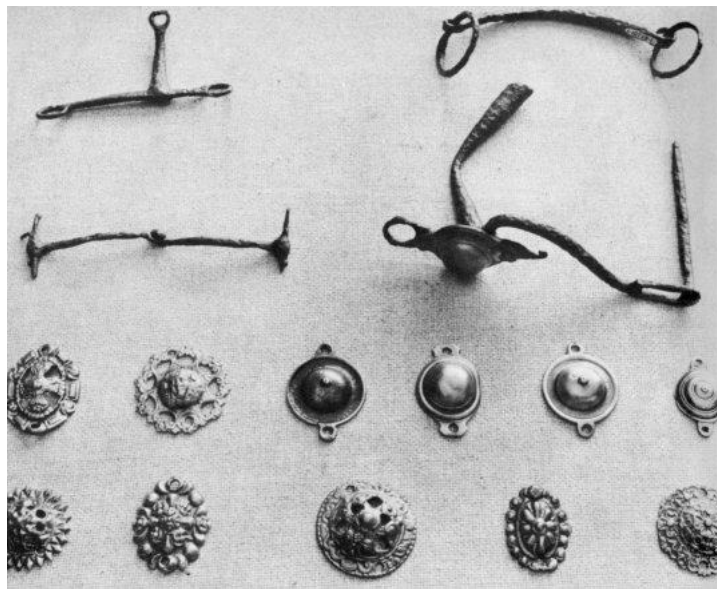
Travel

During the 17th century, travel in Virginia was mainly by boat. As the roads leading from Jamestown to the nearby settlements were usually in deplorable condition, especially after heavy rains, the settlers preferred to travel by water whenever possible. As the colony grew, and roads were improved somewhat, travel by horse became more common, especially for short trips. After 1650 the use of wagons increased, and records indicate that a few of the more prosperous planters imported fine carriages from England.

BOATS AND SHIPS

Boats used by the settlers varied in size from small flat-bottom boats to fairly large sailing vessels, and included such types as small rowboats, pinnaces, barks, bilanders, schooners, ketches, and sloops. Living on a river, and in a tidewater area of innumerable creeks, bays, and rivers, practically all of the colonists were familiar with handling boats of one type or another.

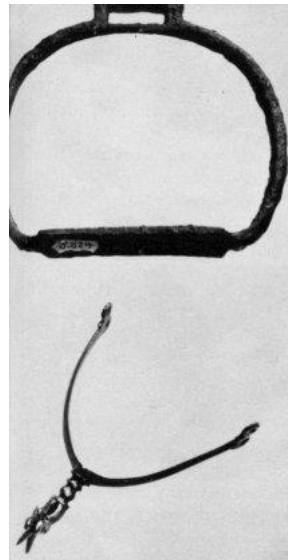
However, only a few objects relating to boats and ships have been unearthed at Jamestown: small anchors, chains, oar locks, ship bolts and spikes, and tools used by shipwrights and ships' carpenters.



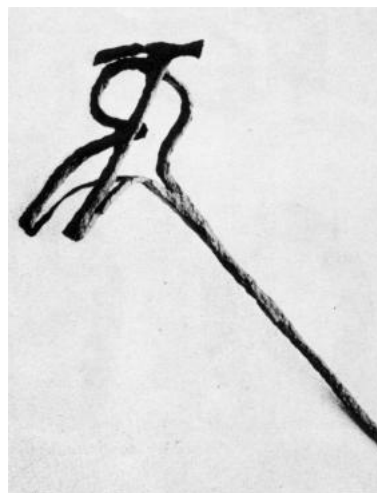
SOME BITS AND BRIDLE ORNAMENTS IN THE JAMESTOWN COLLECTION. THE ARTISTIC DESIGNS ON MANY BRIDLE BOSSES ARE SYMBOLIC OF BEAUTIFUL HANDIWORK PERFORMED BY CRAFTSMEN OF A BYGONE DAY.

HORSES, WAGONS, AND CARRIAGES

The first English-built road in America (in use by 1608) ran 1 mile from Jamestown Island to Glasshouse Point. Later, as the colony grew, the road was extended to Governor Berkeley's plantation, about 4 miles from Jamestown, and other nearby settlements. There is some evidence that it was known as the "Old Road" or "Greate Road."



SEVENTEENTH-CENTURY SPUR AND STIRRUP EXCAVATED AT JAMESTOWN.



THIS BRANDING IRON WAS USED BY ONE OF THE COLONISTS DURING THE EARLY DAYS OF THE SETTLEMENT.

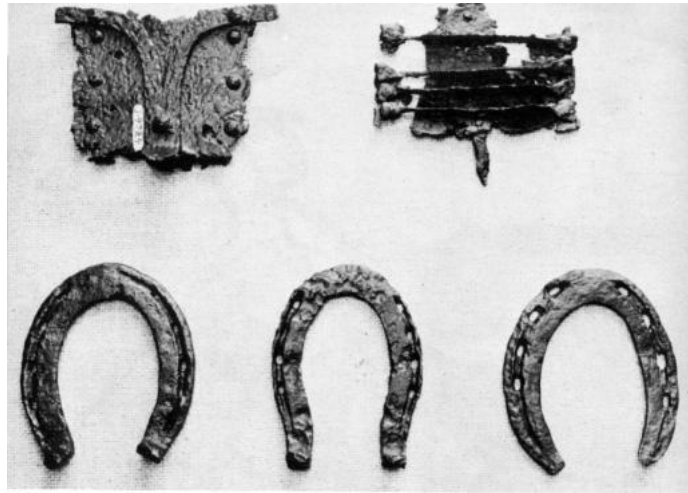
As early as 1609 "six mares and two horses" were brought to Jamestown. In 1611, 17 horses and mares arrived, and in 1614, Capt. Samuel Argall brought several more. Six years later in 1620, 20 horses were shipped from England. It is most surprising, therefore, that the census of 1625 recorded only 1 horse for the entire colony! By 1649, however, it was estimated that there were 300 horses in Virginia, and most of the successful farmers and wealthy planters owned them after 1650. During the following years, the number of horses increased greatly.

Many well-preserved metal objects relating to horse equipment and riding gear have been unearthed.

Bits and Bridle Ornaments.—Most bits are of the snaffle variety, although a few curb bits have been recovered. In those days many bits had brass bosses attached to their cheek bars, and many of these attractive ornaments have been unearthed. Some bosses are decorated with raised designs while others are plain. The majority are made of brass,

although a few iron bosses have been excavated.

Spurs and Stirrups.—A few complete spurs have been excavated. While the majority are plain iron some brass spurs in the collection are decorated with very attractive incised or embossed designs. Two or three of the highly decorated brass spurs are probably of Spanish origin. One of them, in excellent condition, was found near an early brick kiln.



WROUGHT-IRON HORSESHOES AND CURRYCOMBS USED PRIOR TO 1650.



SETTLERS TRADING WITH THE INDIANS—BARTERING CASTING COUNTERS AND OTHER TRADE GOODS FOR FURS. (Conjectural sketch by Sidney E. King.)

All stirrups unearthed are made of wrought iron. Some of the steps or stirrup bars are solid, while others have a single slot.

Horseshoes and Currycombs.—Horseshoes found vary considerably in size, although the majority are relatively small. Many shoes have both toe and heel calks, and in most examples the calks are well worn. The many small shoes that have been excavated may indicate that the horses used in Virginia three centuries ago were much smaller than the 20th-century breeds.

All currycombs found are handwrought, and many have pleasing designs on the backs, formed by the curved iron strips which extend from the handle prong to the back of the comb.

Branding Irons.—Parts of several branding irons were found including a complete example with initials "TR."

Wagon and Carriage Parts.—Archeologists unearthed only a few metal parts from wagons and carriages—reminders of a day when horses and oxen were indispensable animals in the Virginia settlements.

Trade

Some interesting objects recovered at Jamestown relate to early trade. These include items used in trade with the Indians, as well as an excellent assortment of lead bale clips. These clips are decorated discs which were often attached to bales of goods (especially woolen cloth) imported from England. One object, the heaviest unearthed at Jamestown, relates indirectly to trade. It is a 1,300-pound iron piledriver which was once used to build wharfs and piers.

INDIAN TRADE

One reason why the colonists selected a site for Jamestown some miles up the James River was to develop the Indian trade over an extensive area. During the early years of the colony, trade with the natives was encouraged. It is clear from the early records that the settlers bartered such items as beads, cloth, penny knives, shears, bells, glass toys, whistles, hatchets, pots and pans, brass casting counters, and similar objects in exchange for Indian corn (and other vegetables), fish, game, fruits and berries, and furs.

Many examples of English trade goods used for bartering with the Indians have been found on the island, but these can be described only briefly.

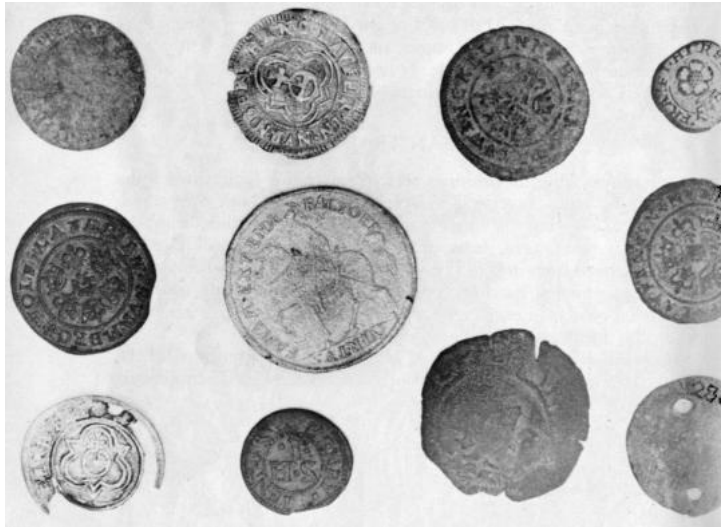
Beads.—The majority of glass beads were shipped from England, although some may have been made in Italy, probably in Venice. As no glass beads were found at or near the site of the glass factory, it is doubtful whether any were made there. Most beads in the collection are round or oval, a few are cylindrical having been cut from colored glass rods. All beads excavated are of one or more colors, with the exception of 2 or 3 that are colorless. After three centuries the

attractive colors still persist; and looking at the colorful beads today you can understand the charm they held for the Indians.

Knives.—Small, inexpensive knives called penny knives, were often used for trading purposes during the years at Jamestown. A few folding knives and blade fragments (which may also have been penny knives) have been recovered.

Shears.—Several shears and scissors, highly prized by the Indians, were found on the island. A few are almost complete.

Bells.—Brass and iron bells of types which were used for bartering with the Indians have been excavated. A few days after the colonists reached Jamestown one of them recorded that "our captaine ... presented [to an Indian chief] gyftes of dyvers sortes, as penny knyves, sheeres, belles, beades, glass toyes &c. more amply then before."



BRASS CASTING COUNTERS EXCAVATED ON JAMESTOWN ISLAND. MANY WERE MADE IN GERMANY BEFORE 1575 FOR USE BY MERCHANTS ON COUNTING BOARDS. IN THE NEW WORLD THEY WERE USED FOR THE INDIAN TRADE.



A FEW OBJECTS UNEARTHED AT JAMESTOWN WHICH WERE USED FOR TRADING WITH THE INDIANS. SHOWN ARE GLASS BEADS, SCISSORS, IRON KNIVES, A HATCHET, AND BELL FRAGMENTS.

Hatchets.—Many fine specimens of handwrought hatchets have been found. These were valuable items during the early years of the settlement, and much sought after by the Indians, so that a large number were used in trading with them. But hatchets were used primarily by the carpenter, cooper, and other artisans.

Pots and Pans.—A pot or pan made of brass or copper was almost worth its weight in gold for trading purposes. A few complete examples, together with numerous fragments, have been recovered.

Brass Casting Counters or Jettons.—Most of these thin brass tokens or counters (similar in appearance to coins) were made in Germany during the second half of the 16th century. In Europe they were used on counting boards for making mathematical calculations, but in the New World it is believed that they were used in the Indian trade. Approximately a dozen have been found at Jamestown. Three were also found on Roanoke Island (site of Raleigh's ill-fated "Lost Colony") and one was recovered in an Indian shell mound near Cape Hatteras, not too distant from Croatoan Island (known today as Ocracoke Island). Many of the counters in the Jamestown collection were made by Hans Schultes and Hans Laufer of Nuremberg, who manufactured such jettons between 1550 and 1574, at which time Nuremberg was a center for the making of casting counters. Some of the counters have holes punched through them, indicating that the Indians may have worn them around their necks like pendants, suspended from leather thongs.

Miscellaneous Items.—Other objects which the English used in trade with the Indians were colored cloth, glass toys, and whistles; but no examples of these have been recovered during archeological explorations.



A WHARF SCENE—ARRIVAL OF A SHIP FROM THE MOTHER COUNTRY. (Conjectural sketch by Sidney E. King.)

ENGLISH AND FOREIGN TRADE

During the 17th century, active trade was carried on between the Virginia colony and the mother country. Local commodities of timber, wood products, soap ashes, iron ore, tobacco, pitch, tar, furs, minerals, salt, sassafras, and other New World raw materials were shipped to England. In exchange, English merchants sold to the colonists, tools, farm implements, seeds, stock and poultry, furniture and household accessories, clothing, weapons, hardware, kitchen utensils, pottery, metalware, glassware, and certain foods and drinks.

There is also good evidence that some trade was carried on with Holland, Germany, Italy, Spain, Portugal, France, Mexico, and the West Indies. Many artifacts unearthed (especially pottery) were made in the countries mentioned. It is believed that certain commodities were acquired by direct trade with the country where made, in spite of the strict laws by which the Colonial Powers sought to monopolize the colonial trade for the benefit of the mother country.

Lead Bale Clips.—A series of decorated lead clips which relate to 17th-century trade have been found at several places on Jamestown Island. As their name implies, these lead clips, or seals, were attached to bales of English goods, usually woolen cloth, to attest that the goods were of an approved quality and length, and of a given amount. Each clip usually consisted of two discs connected by a narrow band, and when used for marking cloth the name or initials of the maker of the material was often incised on one of the discs. The clips, too, were often embossed with a decorative device such as a coat of arms, crest, crown, name or initials of a king, numerals, king's head, royal arms, animal, or flower. Over a dozen of these small lead clips have been unearthed, and serve as reminders of a past day when majestic English merchantmen sailed to Jamestown laden with bales of goods from the mother country.



LEAD BALE CLIPS USED FOR SEALING BALES OF WOOLEN CLOTH AND OTHER GOODS. ONCE A CLIP HAD BEEN ATTACHED TO A BALE IT ATTESTED THAT THE GOODS WERE OF AN APPROVED QUALITY AND LENGTH OR AMOUNT.



THIS 1,300-POUND IRON PILEDRIVER USED FOR DRIVING PILES IN THE BUILDING OF SMALL WHARVES WAS FOUND AT JAMESTOWN.



BUILDING A WHARF, ABOUT 1650. (Conjectural sketch by Sidney E. King.)

Piers and Wharfs.—In order to accommodate such large sailing vessels, piers and wharfs had to be built at Jamestown. A 1,300-pound iron piledriver was found in the basement of a 17th-century building in 1955. It was probably used three centuries ago for driving piles in the James River during construction of a small wharf.

Worshipping

The Jamestown colonists were, for the most part, religious and God-fearing people. The majority were members of the Church of England. One of the first settlers, the Rev. Robert Hunt, was an ordained minister of that church. Whenever possible, services were held every morning and evening, and sermons delivered twice on Sundays.

A few ornamental brass book clasps excavated near Jamestown may have been used on early Bibles and Prayer Books. Under the care of Bruton Parish Episcopal Church in Williamsburg are four pieces of communion silver which were used in the church at Jamestown. Two pieces, an exquisite chalice and paten, were donated to the Jamestown church by Lt. Gov. Francis Morrison (or Moryson) in 1661. Inscribed on both is the legend: "Mixe not holy thinges with profane." A second paten, made in London in 1691-92, was given to the Jamestown Church by Gov. Edmund Andros in 1694. Another paten, or a collection plate (also made in London), bears the inscription: "For the use of James City Parish Church."



DECORATED BRASS BOOK CLASPS FOUND NEAR JAMESTOWN WHICH MAY HAVE BEEN USED ON AN EARLY BIBLE OR PRAYER BOOK

The officials of the Virginia Company of London, admonishing the first settlers to serve and fear God in order to plant

a successful and prosperous colony, advised:

Lastly and chiefly the way to prosper and achieve good success is to make yourselves all of one mind for the good of your country and your own, and to serve and fear God the Giver of all Goodness, for every plantation which our Heavenly Father hath not planted shall be rooted out.

Seemingly the advice was carried out, for from the small settlement on a tiny island in the James River grew a great and mighty nation.



COMMUNION SILVER USED IN THE JAMESTOWN CHURCH AFTER 1661. BOTH THE CHALICE AND PATEN WERE MADE IN LONDON, AND DONATED TO THE CHURCH BY LT. GOV. FRANCIS MORRISON (OR MORYSON) IN 1661. ON BOTH PIECES IS THE LEGEND: "MIXE NOT HOLY THINGES WITH PROFANE."

Select Bibliography

- BAILEY, WORTH. "Concerning Jamestown Pottery—Past and Present." *Ceramic Age*, pp. 101-104. October 1937.
- . "Joseph Copeland, 17th Century Pewterer." *The Magazine Antiques*, pp. 188-190. April 1938.
- . "Lime Preparation at Jamestown in the Seventeenth Century." *William and Mary College Quarterly*, pp. 1-12. January 1938.
- . "Notes on the Use of Pewter in Virginia During the Seventeenth Century." *William and Mary College Quarterly*, pp. 227-241. April 1938.
- BRUCE, PHILLIP ALEXANDER. *Economic History of Virginia in the Seventeenth Century*. 2 Vols. New York. Peter Smith. 1935.
- FORMAN, HENRY CHANDLER. *Jamestown and St. Mary's*. Baltimore. The Johns Hopkins Press. 1938.
- . "The Old Hardware of James Town." *The Magazine Antiques*, pp. 30-32. January 1941.
- HARRINGTON, J.C. *Glassmaking at Jamestown*. Richmond, Va. The Dietz Press, Inc. 1952.
- . "Seventeenth Century Brickmaking and Tilemaking at Jamestown, Virginia." *The Virginia Magazine of History and Biography*, pp. 16-39. January 1950.
- . "Some Delft Tiles Found at Jamestown." *The Magazine Antiques*, pp. 36-37. January 1951.
- . "Tobacco Pipes from Jamestown." *Quarterly Bulletin Archeological Society of Virginia*, June 1951.
- HONEY, WILLIAM B. *European Ceramic Art from the end of the Middle Ages to about 1815*. New York. 1949.
- . *Glass: A Handbook and a Guide to the Museum Collection*. Victoria and Albert Museum, London. 1946.
- HUDSON, J. PAUL. "The Story of Iron at Jamestown, Virginia—Where Iron Objects Were Wrought by Englishmen Almost 350 Years Ago." *The Iron Worker*, pp. 2-14. Summer 1956.
- AND C. MALCOLM WATKINS. "How Pottery Was Made at Jamestown, Virginia—Where Englishmen First Made Earthenware Vessels in the New World Over Three Hundred Years Ago." *The Magazine Antiques*. January 1957.
- INNOCENT, C.F. *Development of English Building Construction*. University Press. Cambridge, England. 1916.
- LANE, ARTHUR. *A Guide to the Collection of Tiles*. Victoria and Albert Museum. London. 1939.
- PETERSON, CHARLES E. "Some Recent Discoveries at Jamestown." *The Magazine Antiques*, pp. 192-194. May 1936.
- PETERSON, HAROLD L. *Arms and Armor in Colonial America*. Stackpole Company. Harrisburg, Pa. 1956.
- SONN, ALBERT H. *Early American Wrought Iron*. 3 Vols. Charles Scribner's Sons. New York. 1928.

OTHER PUBLICATIONS OF THE NATIONAL PARK SERVICE RELATING TO JAMESTOWN

FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D.C.

Jamestown, Virginia, the Townsite and Its Story (Historical Handbook Series No. 2) 25 cents.

James Towne in the Words of Contemporaries (Source Book Series No. 5) 20 cents.

America's Oldest Legislative Assembly and Its Jamestown Statehouses (Interpretive Series No. 2) 25 cents.

Footnote 1: After the Third Statehouse burned, it was replaced on the same foundations by the Fourth (and last) Statehouse built on Jamestown Island, which burned in 1698. The Fifth Statehouse, now reconstructed at Williamsburg, also burned, continuing an unhappy tradition that includes the destruction of the National Capitol at Washington in 1814 and the Virginia Statehouse at Richmond in 1865.

*** END OF THE PROJECT GUTENBERG EBOOK NEW DISCOVERIES AT JAMESTOWN ***

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